

Project Manual

PROJECT NO. 081047-00

PROJECT TITLE: Roof Replacement

DATE: January 8, 2021

State University of New York at New Paltz



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(01/08/21 as Issued for Bid)

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M-101 HVAC Roof Construction Plan FOB
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P-064 Plumbing – FOB Roof Demolition Plan
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P-104 Plumbing – FOB Roof Construction Plan
P-301 Plumbing – Riser Diagram I
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E-002 Electrical Notes and Drawing List
DE-101 Electrical Roof Removals Plan - SAB
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List in order printed

00 31 00 Available Project Information

(Refer to Section 2.12 of the Agreement regarding use of this information)

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**STATE UNIVERSITY CONSTRUCTION FUND
NOTICE TO BIDDERS**

(Newspaper Ad)

The State University Construction Fund will receive sealed Proposals for Project No. 081047-00 Titled Replace Roofs at SUNY New Paltz until 2:00 p.m. Local Time on 03/31/2021 at the Fund's Office at H. Carl McCall SUNY Building , 353 Broadway, Albany NY 12246, where such proposals will be publicly opened and read aloud.

All work will be completed within 280 calendar days from receipt of the Notice to Proceed.

The Fund's project specific goals for this project are 5% MBE and 5% WBE and 3% SDV.

A pre-bid conference and project walk through will be held on 03/11/21 with all contractors assembled at 10:00am at the McKenna Theatre, SUNY New Paltz, 1 Hawk Drive, New Paltz, NY 12561.

Bidding and Contract Documents may be examined free of charge at the campus and at:

Consultant's Office 307 Seventh Ave., Suite 1501, New York, NY 10001
212-352-3307 attn: John O'Connor or Jason Campagna

Plan Rooms

CMD (formerly Reed) <i>(subscribers only):</i>	Visit www.cmdgroup.com
Dodge Reports	Visit www.construction.com
Construc Contractors Assn of the Hudson Valley Inc.	Visit www.ccahv.com
Minority Contractors Assoc of Central NY	Visit stevenecoker@rocketmail.com
Eastern Contractors Assoc	Visit www.ecainc.org
NYS Assoc of Minority Contractors	Visit www.nysamc.com
Albany Ctr for Economic Success	Visit www.l.wynne@acesincubator.org
Mohawk Valley Builders Exchange	Visit www.mvbe.com

Complete sets of Contract Documents for bidding may be obtained from the Consultant upon receipt of a payment of \$49.00 for a printed copy or \$10 for an electronic copy, made payable to the Consultant, for each complete set. The Fund waives fees and deposits for sets of the Contract Documents requested by NYS certified Minority- and Women-Owned Business Enterprise or Service-Disabled Veteran-Owned Business Enterprise.

Bids must be submitted in duplicate in accordance with the instructions contained in the Information for Bidders. Security will be required for each bid in an amount not less than five (5) percent of the Total Bid. Visit <http://www.sucf.suny.edu/business/bidcal.cfm> and download the "Bid and Post Bid Checklist" that gives bidders a one page summary of how to be prepared if bidding.

It is the policy of the State of New York and the Fund to encourage minority/women's business enterprise participation in this project by contractors, subcontractors and suppliers, and all bidders are expected to cooperate in implementing this policy.

The Fund reserves the right to reject any or all bids.

STATE UNIVERSITY CONSTRUCTION FUND

Eastern Contractors Assoc

6 Airline Drive, Albany, NY 12205

NYS Assoc of Minority Contractors

Brooklyn Navy Yard Bldg. 280, 4th Fl, Brooklyn NY 11205

Albany Ctr for Economic Success

#101, 255 Orange Street, Albany, NY 12210

Mohawk Valley Builders Exchange

728 Court Street, Utica, N.Y. 13502

Plans will be available on 03/01/21 from Bluedge, 575 Eighth Avenue New York, NY 10018, 212-366-7250, csr.ny@bluedge.com in either electronic or paper format. Bidders will be able to access the project online at the Printer's web site:

(Insert here the web address of online plan room: <http://dfs.nrinet.us/sucf>)

To register as a plan holder and purchase bid documents follow the link provided. The home screen under Project Search contains the Bluedge contact inform to purchase the documents and register as a plan holder. To view thumbnails select "View project details" under the content tab you will be able to select folders to view plans or specifications.

Bidders who register as a planholder through the Printer may acquire the bidding and contract documents using the following options:

1. For a fee of ten dollars (\$10), interested firms may request and receive an electronic download of the bidding and contract documents. At the bidder's expense, purchase a printed copy or copies of the bid set.
2. For a fee of ten dollars (\$10), interested firms may request and receive a CD with electronic copies of the bidding and contract documents. At the bidder's expense, purchase a printed copy or copies of the bid set.
3. For a fee of \$49, interested firms may request and receive a printed copy of the complete set. An electronic download or copy on CD will not be provided.

The Fund waives fees and deposits for sets of the Contract Documents requested by NYS certified Minority- and Women-Owned Business Enterprise or Service-Disabled Veteran-Owned Business Enterprise. Payments of less than \$50.00 are non-refundable. Deposits of \$50.00 or more will be returned to all entities who have paid the aforesaid deposit for the entire set of Bidding and Contract Documents and who return such sets to the Consultant in good condition within forty-five (45) calendar days after the opening of bids, not exceeding five (5), so returned to the Consultant.

Bids must be submitted in duplicate in accordance with the instructions contained in the Information for Bidders. A Bid Security will be required for each bid in an amount not less than five (5) percent of the Total Bid. It is the policy of the State of New York and the Fund to encourage minority and women-owned business enterprise participation in this project by contractors, subcontractors and suppliers. All bidders are expected to cooperate in implementing this policy.

Please be advised that the Fund's insurance requirements are contained in the bidding documents. Paragraph (1)a of Section 5.06 of Article V of the Agreement requires that all insurance must be provided by companies approved by the Fund, licensed to do business in the State of New York ("admitted" carriers), and rated at least "A-" by A.M. Best Company. Excess line insurers are not acceptable.

Please be advised that Section 11 Requirements and Procedures for Participation by New York State -Certified Minority and Women -Owned Business Enterprises and Equal Employment Opportunities for Minority Group Members and Women in 00 21 13 20 Information for Bidders have been changed for projects advertised after Jan. 1, 2017.

Please visit <http://www.sucf.suny.edu/business/bidcal.cfm> and download the "Bid and Post Bid Checklist" that gives bidders a one page summary of how to be prepared if bidding.

Please note that Sections 139-j and 139-k of the State Finance Law imposes certain restrictions on communications between the Fund and bidders during the procurement process. Pursuant to those sections of law, the Fund designates the following persons to which communications concerning this procurement may be addressed:

Peggy McSorley 518 320-1710

Joanne Lovelady 518 320-1711 (MWBE issues only)

Contact with other than the above-designated Fund employees concerning this procurement may result in the rejection of your bid. To purchase plans or for technical inquiries specific to this project, please contact the Architect or Engineer of Record.

INTEGRITY HOTLINE: As part of its Corporate Integrity Program, the Fund operates an Integrity Hotline 24-hours a day, seven-days a week. If you have knowledge of or suspect fraudulent, unethical, or other misconduct on a Fund project, please call the Hotline toll-free at 866-543-8107 or locally at 518-320-1525. All calls will be received and reviewed only by the Corporate Integrity Officer. Calls can be made anonymously or on a confidential basis. The identity of confidential callers will be fully protected. The Hotline is not equipped with Caller ID and no effort will be made to identify anonymous callers.

The Fund reserves the right to reject any or all bids.

On bid day, bidders must:

- Be aware of the requirements of the **project specific** Section 00 21 13 10 Notice to Bidders.
- Be aware of the requirements of the **project specific** Section 00 21 13 20 *Information for Bidders*.
- Provide two (2) complete original **project specific** Proposals per Sections 3 and 5 of the *Information for Bidders*.
 - Attachment A of the Proposal (List of Completed Similar Construction Projects) must be completed.
 - Before completing Attachment A, read the **project specific** requirements of Section 7 Qualification of Bidders and Section 01 11 00 Description of Work (Section A).
- Provide two (2) complete original Bid Bonds per the Instructions for Execution of Bid Bond and Acknowledgment, or other bid security per Section 6 of the *Information for Bidders*.
 - Use the Bid Bond with date Dec 2015 in the lower right-hand corner.
- Deliver the Proposals and bid security in the special bid envelope per the *Notice to Bidders*.
- Be in compliance with NYS Dept. of State registration requirements. Nominated subs must also comply.
 - See http://www.dos.ny.gov/corps/bus_forms.html
- Be aware that all insurance must be provided by companies approved by the Fund, [licensed to do business in the State of New York \("admitted" carriers\)](#), and rated at least "A-" by A.M. Best Company.
 - Excess line insurers are not acceptable.
 - Please consult your insurance agent prior to bidding, who should be aware of Sections 5.06 and 5.07 of the [Agreement](#) and other requirements of Article V.
- Be aware of project specific physical conditions and subsurface conditions that could reasonably anticipated from the provisions of the Contract Documents, Section 00 31 00 Available Project Information (if applicable), and other information available to bidders and from the bidder's own inspection and examination of the site.

Post bid, bidders must:

1. Within 48 Hours after the time of the Bid Opening:
 - Provide a completed Appendix "A" per Section 8(1)d of the *Information for Bidders*.
 - Provide a Construction Schedule per Section 8(1)b of the *Information for Bidders*.
 - Provide a completed [NYS Vendor Responsibility Questionnaire For-Profit Construction \(CCA-2\)](#) per Section 8(1)a of the *Information for Bidders*.
 - Confirm the CCA-2 shows financial information required by Section 7(2) of the *Information for Bidders*.
 - Confirm the CCA-2 Attachment A shows completed construction contract information required by Section 7(3) of the *Information for Bidders*.
 - Confirm the CCA-2 includes the additional information requested for "Yes" responses, if any.
 - Confirm the CCA-2 Attachments A and B show current information for owners, architects and their current telephone numbers for contracts listed.
 - Provide names of proposed subcontractors per Section 8(1)c.iv of the *Information for Bidders*.
 - Provide detailed descriptions of work for projects listed in Attachment A of your Proposal (List of Completed Similar Construction Projects) if such descriptions did not fit or if requested by the Fund.

2. Within seven days after the time of the Bid Opening:
 - Provide CCA-2 for each proposed subcontractor per Section 8(1)c of the *Information for Bidders*.
 - Confirm the CCA-2 includes the additional information requested for “Yes” responses.
 - Confirm the CCA-2 Attachments A and B show construction contract information for owners, architects and their current telephone numbers.
 - Provide an MWBE Utilization Plan per Section 8(3) of the *Information for Bidders*.
 - Provide an EEO Statement and Plan per Section 8(4) of the *Information for Bidders*.
 - Provide proof of workers’ compensation and disability benefits insurance coverage. This is the Workers Comp/Disability link for employers: <http://www.wcb.ny.gov/content/main/Employers/Employers.jsp> This is the link with a description of the required forms for Workers Compensation and Disability: <http://www.osc.state.ny.us/agencies/guide/MyWebHelp/Content/XI/18/G.htm>
3. Prior to the Fund sending you a Notice of Award letter:
 - Provide additional information per Section 8(5) of the *Information for Bidders*.
4. After your receipt of the Notice of Award letter, provide the following by the date stipulated in the letter transmitting the Notice of Award:
 - Sign and complete the Contractor’s portion of the **Project Specific** Agreement sent to you by the Fund.
 - Provide required bonds per Section 10 of the *Information for Bidders*.
 - Provide the 120-day Construction Schedule required by the General Requirements, Special Conditions paragraph titled “Project Schedule.”
 - Provide the completed insurance forms per Sections 5.06 and 5.07 of the Agreement.
5. Prior to starting work:
 - Be in receipt of the Notice to Proceed letter issued by the Fund.

STATE UNIVERSITY CONSTRUCTION FUND INFORMATION FOR BIDDERS

Section 1 Definitions

All definitions set forth in the Agreement are applicable to the Notice to Bidders, Information for Bidders and the Proposal, all of which documents are hereinafter referred to as the Bidding Documents.

Section 2 Issuance of Bidding and Contract Documents

Drawings and Specifications will be issued by the Consultant upon request after payment of the deposit specified in the Notice to Bidders.

Section 3 Proposals

- (1) Proposals must be submitted in duplicate on the forms provided by the Fund. They shall be addressed to the Fund in a sealed envelope, provided by the Fund, marked with the name and address of the bidder, the title of the Project and the Project number. The Fund accepts no responsibility for Proposals that may be delivered by any courier or other messenger service that does not contain all of the above-noted information on the outside of a sealed envelope. Facsimile or email copies of the Proposal will not be accepted by the Fund.
- (2) All blank spaces in the Proposal must be filled in and, except as otherwise expressly provided in the Bidding Documents; no change is to be made in the phraseology of the Proposal or in the items mentioned therein.
- (3) Proposals that are illegible or that contains omissions, alterations, additions or items not called for in the Bidding Documents may be rejected as informal. In the event any bidder modifies, limits or restricts all or any part of its Proposal in a manner other than that expressly provided for in the Bidding Documents, its Proposal may be rejected as informal.
- (4) Any Proposal may be considered informal which does not contain prices in words and figures in all of the spaces provided or which is not accompanied by a bid security in proper form. In case any price shown in words and its equivalent shown in figures do not agree, the written words shall be binding upon the bidder. In case of a discrepancy in the prices contained in the Proposal forms submitted in duplicate by the bidder, the Proposal form which contains the lower bid shall be deemed the bid of the bidder; provided, however, the Fund at its election may consider the Proposal of such bidder informal.
- (5) If the Proposal is made by a corporation, the names and places of residence of the president, secretary and treasurer shall be given. If by a partnership, the names and places of residence of the partners shall be given. If by a joint venture, the names and addresses of the members of the joint venture shall be given. If by an individual, the name and place of residence shall be given.

- (6) No Proposal will be considered which has not been deposited with the Fund at the location designated in and prior to the time of opening of bids designated in the Bidding and Contract Documents or prior to the time of opening as extended by Addendum.
- (7) Bids may be modified, withdrawn or canceled only in writing or by email notice received by the Fund prior to the time of opening of bids designated in the Bidding and Contract Documents. A written or email notice of modification, withdrawal or cancellation shall be marked by the bidder with the name and address of the bidder, the title of the Project and the Project number. Upon receipt by the Fund, a duly authorized employee of the Fund shall note thereon the date and time of receipt and shall thereupon attach said written or email notice of modification, withdrawal or cancellation to the envelope submitted by the bidder pursuant to subdivision (1) of this Section. *Bid Modification email address: modifymybid@suny.edu . Submit modification amount only, (i.e. "deduct" or "add" \$XXX, not revised total bid amount. For email notice, submit modification as an attachment in portable document format (PDF) on bidder's letterhead signed by a duly authorized representative of the bidder.*
- (8) Permission will not be given to modify, explain, withdraw or cancel any Proposal or part thereof after the time designated in the Bidding and Contract Documents for the opening of bids, unless such modification, explanation, withdrawal or cancellation is permitted by law and the Fund is of the opinion that it is in the public interest to permit the same.

Section 4 Examination of Bidding and Contract Documents

- (1) Prospective bidders shall examine the Bidding and Contract Documents carefully and, before bidding, shall make written request to the Consultant (with a copy thereof to the Fund) for an interpretation or correction of any ambiguity, inconsistency or error therein which should be discovered by a reasonably prudent bidder. Such interpretation or correction as well as any additional Contract provision the Fund shall decide to include will be issued in writing by the Consultant as an Addendum, which will be sent to each person recorded as having received a copy of the Bidding and Contract Documents from the Consultant, and which also will be available at the places where the Bidding and Contract Documents are available for inspection by prospective bidders. Upon such emailing or delivery and making available for inspection, such Addendum will become a part of the Bidding and Contract Documents and will be binding on all bidders whether or not the bidder receives or acknowledges the actual notice of it. Prospective bidders are responsible for ensuring that all addenda have been incorporated into the bid. The requirements contained in all Bidding and Contract Documents shall apply to all Addenda.
- (2) Only the written interpretation or correction so given by Addendum shall be binding. Prospective bidders are warned that no trustee, officer, agent or employee

of the Fund or the Consultant is authorized to explain or interpret the Bidding and Contract Documents by any other method, and any such explanation or interpretation, if given, must not be relied upon.

Section 5 Computation of Bid

- (1) In computing their bids, bidders are not to include the sales and compensating use taxes of the State of New York or of any city and county in the State of New York for any supplies or materials which are incorporated into the completed Project as the same is exempt from such taxes.
- (2) Unit prices may be inserted in the Proposal by the Fund or the bidder at the discretion of the Fund. Any unit prices listed in the Proposal by the Fund are based upon the Consultant's appraisal of a fair cost for the work involved. Such listed prices will be binding upon both the bidder and the Fund unless the bidder wishes to change any of such unit prices by crossing out the listed unit price and inserting a revised unit price. Such revised unit price shall not be binding upon the Fund unless it accepts the same, in writing, before it issues a Notice of Award. In the event the Proposal contains blank spaces for unit prices or the bidder revises any stated unit price, the amount of such unit prices for additions shall not vary by more than 15 percent from the prices inserted by the bidder for deductions, and, if the variance of such prices exceeds 15 percent, the Fund may adjust the deduction price inserted by the bidder so that it is only 15 percent lower than the addition price inserted by the bidder. In addition, the Fund may adjust any unit price filled in by a bidder to an amount agreeable to both the bidder and the Fund or it may reject any unit prices.
- (3) Alternates, if any, listed in the Proposal and described in Section 01 23 00 (Section B) of the Technical Specifications shall be accepted in the order indicated and will be used in combination with the Total Bid to determine the low bidder. Unit prices will not be used to determine the low bidder.

Section 6 Payment of Bid Security

- (1) Each Proposal must be accompanied by the required amount of the bid security in the form of a bank draft or certified check, payable at sight to the Fund and drawn on a bank authorized to do business in the United States, or by a Bid Bond, on a form approved by the Fund, duly executed by the bidder as principal and having as surety thereon a surety company or companies, approved by the Fund, authorized to do business in the State of New York as a surety. Attorneys-in-fact who execute a Bid Bond on behalf of a surety must affix thereto a certified and effectively dated copy of their power of appointment.
- (2) The Fund will return, without interest, the bid security of a bidder, unless such security be in the form of a Bid Bond which will not be returned by the Fund, in accordance with the following procedure:

- a. To all bidders except the apparent three (3) lowest bidders within two (2) working days after the opening of bids.
 - b. To any bidder submitting a Bid Bond, meeting the requirements of paragraph (1) hereof, after the opening of bids, as a substitute for a bank draft or certified check within two (2) working days after the Fund's approval of such Bid Bond.
 - c. To the apparent three (3) lowest bidders, unless their bid security was previously returned, within two (2) working days after delivery to the Fund by the successful bidder of the executed Agreement and required Bonds, or within two (2) working days of the Fund's rejection of all bids or within two (2) working days after the expiration of forty-five (45) calendar days after the bid opening or within the time to which the issuance of a Notice of Award may have been extended, whichever event shall occur last.
- (3) The Fund reserves the right to deposit bid security drafts or checks pending final disposal of them.

Section 7 Qualifications of Bidders

- (1) A bidder must demonstrate, to the satisfaction of the Fund, that it has successfully completed three (3) contracts similar in size, scope and complexity to this contract within the last five (5) years.
- a. For scope and complexity, similar work is defined as Roof Replacement work, as further described in the General Requirements, Section 01 11 00, Description of Work.
 - b. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the Fund.
 - c. The above three projects shall be submitted on Attachment A of the Proposal, "List of Completed Similar Construction Projects" (the List). If the List is not provided or is missing information, and/or is found to have erroneous information or information that is no longer current, a Proposal may be rejected as not responsive. If requested by the Fund, the bidder may be permitted to add missing information, modify and/or explain erroneous information or information that is no longer current on the List. Modifications and/or explanations of the List must be received within 48 hours of receipt of the Fund's request.
- (2) All prospective bidders must demonstrate to the satisfaction of the Fund that they have the skill and experience, as well as the necessary facilities, ample financial resources, ability to manage staff and subcontractors effectively, ability to anticipate and plan construction work for optimal progress, ability to create, strive for and maintain working environments and relationships that are constructive, communicative and cooperative, organization and general reliability to do the work

to be performed under the provisions of the Contract in a satisfactory manner and within the time specified.

- (3) Each bidder must demonstrate to the satisfaction of the Fund that it has working capital available for the Project upon which it is bidding in an amount equal to 15 percent of the first \$100,000 of the amount of its Total Bid plus 10 percent of the next \$900,000 plus 5 percent of the remainder of its Total Bid. Working capital is defined as the excess of current assets over current liabilities. The Fund defines current assets as assets which can be reasonably expected to be converted into cash within a year, and current liabilities as debts which will have to be paid within a year.
- (4). The Fund may make such investigation as the Fund deems necessary to determine the responsibility of any bidder or to determine the ability of any bidder to perform the Work. Bidders shall furnish to the Fund all information and data required by the Fund, including complete financial data, within the time and in the form and manner required by the Fund. The Fund reserves the right to reject any bid if the evidence required by the Fund is not submitted as required or if the evidence submitted by or the investigation of any bidder fails to satisfy the Fund that the bidder is responsible, or is able or qualified to carry out the obligations of the Contract or to complete the Work as contemplated.
- (5) At the time of the bid opening, all bidders and subcontractors, domestic and foreign, must be in compliance with New York State business registration requirements. Contact the NYS Department of State regarding compliance.

Section 8 Submission of Post-Bid Information

- (1) Within forty-eight (48) hours after the opening of bids, each of the apparent three lowest bidders, unless otherwise directed by the Fund or otherwise provided in the Bidding and Contract Documents, shall submit to both the Fund and the Consultant:
 - a. Evidence of a completed New York State Uniform Contracting Questionnaire (Vendor Responsibility Questionnaire For-Profit Construction (CCA-2)). Either email confirmation that the bidder's CCA-2 is current and certified in the New York State VendRep System (VendRep) within the last six months from the bid date, or deliver a certified paper format CCA-2, including all attachments, to the Fund.

The Fund recommends that vendors file the required CCA-2 online via the VendRep. To enroll in and use the VendRep, see the VendRep Instructions at http://www.osc.state.ny.us/vendrep/vendor_index.htm or go directly to the VendRep online at <https://portal.osc.state.ny.us>. To request assistance, contact the Office of the State Comptroller's ("OSC") Help Desk at 866-370-4672 or 518- 408-4672 or by email at ciohelpdesk@osc.state.ny.us.

The paper format CCA-2 and accompanying definitions are available on the OSC website at the following location:

http://www.osc.state.ny.us/vendrep/forms_vendor.htm

- b. A working plan and schedule showing clearly, in sequence and time-scale, all significant activities of the work. The working plan and schedule shall be in the form of suitable charts, diagrams or bar graphs and shall be based on the Contractor's logic and time estimates for the anticipated time of commencement and completion of the work and its significant phases and activities and the interrelationship between such significant activities and other items pertinent to the work. This requirement is in addition to and not a substitute for the schedule requirements of Section 3.02 (Time Progress Schedule) of the Agreement. Although the working plan and schedule submitted shall not be used in determining the lowest responsible bidder, failure to submit the working plan and schedule may result in the rejection of the Proposal as not responsive.
- c. The names and addresses of the bidder's proposed subcontractor for the Asbestos Abatement work of any value, and proposed subcontractors for Electrical Work, the Heating, Ventilating and Air-Conditioning Work and the Plumbing Work for each of said work categories valued at \$20,000 or more.
 - i. For each proposed subcontractor named, provide a completed "List of Completed Similar Construction Projects (the List)." If the List is not provided or is missing information, and/or is found to have erroneous information or information that is no longer current, a proposed subcontractor may be rejected. If requested by the Fund, the bidder may be permitted to add missing information, modify and/or explain erroneous information or information that is no longer current on the List; modifications and/or explanations of the List must be received promptly after receipt of the Fund's request.
 - ii. Only one proposed subcontractor should be named for each of such trades. Proposed subcontractors of the bidder may not be changed except with the specific written approval of the Fund.
 - iii. The naming of the bidder itself for any of such work is not acceptable and may result in rejection of the bidder unless the bidder can demonstrate to the Fund that it has successfully completed or substantially completed three (3) contracts similar in size, scope and complexity for the designated work within the last five (5) years. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the Fund.
 - iv. The bidder will be required to establish, to the satisfaction of the Consultant and the Fund, the reliability and responsibility of each of their said proposed subcontractors to furnish and perform the work described

in the sections of the Specifications pertaining to each of such proposed subcontractors' respective trades. By submission of the "List of Completed Similar Construction Projects," a proposed subcontractor must be able to demonstrate that they have successfully completed or substantially completed three (3) contracts similar in size, scope and complexity for the designated work within the last five (5) years. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the Fund.

- v. For each of the proposed subcontractors, the bidders must submit to the Fund, seven (7) calendar days after the bid opening, evidence of a completed New York State Uniform Contracting Questionnaire (Vendor Responsibility Questionnaire For-Profit Construction (CCA-2)). Either email confirmation that the subcontractor's CCA-2 is current and certified in the New York State VendRep System (VendRep) within the last six months from the bid date, or deliver a certified paper format CCA-2, including all attachments, to the Fund.
 - vi. In the event that the Fund and the Consultant reject any of said proposed subcontractors, the bidder, within two (2) working days after receipt of notification of such rejection, shall again submit to the Fund and the Consultant the name of another proposed subcontractor in place of the one rejected and it will be required to establish to the satisfaction of the Fund and the Consultant the reliability and responsibility of said proposed subcontractor; When naming another proposed subcontractor, the bidder must promptly submit the proposed subcontractor's completed "List of Completed Similar Construction Projects" and their completed CCA-2.
 - vii. The bidder will not be permitted to submit another proposed subcontractor if it designated itself for any of the aforesaid categories of work.
 - viii. Proposed subcontractors of the bidder, approved by the Fund and the Consultant, must be used on the work for which they were proposed and approved and they may not be changed except with the specific written approval of the Fund.
- d. A breakdown of the amount of the bidder's Proposal. Such breakdown shall be prepared in accordance with the format included herein to as Appendix "A". No bidder shall be barred from revising, in the Contract breakdown required under the provisions of Section 4.08 of the Agreement, the various amounts listed in the bid breakdown required under the provisions of this Section. The amount set forth in said bid breakdown will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

- (2) Within seven (7) calendar days after the opening of bids, the three low bidders shall submit to the Fund for its approval a Service-Disabled Veteran-Owned Businesses Utilization Plan on the form SDV-UP, which is bound in Section 00 21 13 30, Service-Disabled Veteran-Owned Business Utilization Plan (SDV-UP), of the Project Manual.
- (3) Except for Contracts of \$100,000 or less, and unless otherwise directed by the Fund, **within seven (7) calendar days** after the opening of bids, the three low bidders shall **submit to the Fund** for its approval, a Minority and Women-owned Business Enterprise Utilization Plan (UP-1). The Utilization Plan should include the description of work and the estimated dollar value of subcontracts and supply contracts that will be awarded to Minority and Women-owned Business Enterprises.
- (4) Except for contracts of \$100,000 or less, **within seven (7) calendar days** after the opening of bids, the three low bidders shall **submit to the Fund** for its approval, an Equal Employment Opportunity Statement.
- (5) The above information and such other information as the Fund or the Consultant may request or obtain will be used by the Fund in determining the reliability and responsibility of the bidder and any proposed subcontractors. Each bidder must comply promptly with all requests by the Fund and the Consultant for information and must actively cooperate with the Fund and the Consultant in their efforts to determine the qualifications of the bidder and any proposed subcontractors. Failure to comply with the latter may result in the rejection of the Proposal as not responsive. All information required to be furnished to the Fund under this Section shall be sent to the State University Construction Fund, Director of Design, State University Plaza, 353 Broadway, Albany, New York 12246 or emailed to the Fund at Peggy.McSorley@suny.edu unless a signed original is required to be submitted.

Section 9 Award of Contract

- (1) The award of the Contract shall be made to the bidder submitting the lowest bid that is responsive to the solicitation and who, in the sole opinion of the Fund, is qualified to perform the work involved and is responsible and reliable. The Fund shall determine the lowest bid by adding to or deducting from the Total Bid of the bidders the additive or deductive alternates, if any, the Fund elects to accept after the opening of the Proposals. Alternates will be accepted in the order they are set forth in the Proposal. The unit prices set forth in the Proposal for additions to or deductions from the work shall not be considered in determining the lowest bid.
- (2) The right is reserved, if, in the Fund's judgment, the public interest will be promoted thereby, to reject any or all Proposals, to waive any informality in any Proposal received or to afford any bidder an opportunity to remedy any deficiency resulting from a minor informality or irregularity. Without limiting the generality of the foregoing:

- a. A Proposal may be rejected as not responsive if the bidder fails to furnish the required bid security or to submit the data required with or after its Proposal and this Information for Bidders.
 - b. A Proposal may be rejected as not responsive if the bidder cannot show to the satisfaction of the Fund: (i) that it has the necessary qualifications and capital; or (ii) that it owns, controls or can procure the necessary plant and equipment to commence the work at the time prescribed in the Contract and thereafter to prosecute and complete the work at the rate, or within the time specified; or (iii) that it is not already obligated by the performance of so much other work as is likely to delay the commencement, prosecution or completion of the work contemplated by the Contract.
 - c. A Proposal will be rejected as not responsive if it does not provide for the completion of the work by the date of completion specified in the Proposal.
- (3) The Fund also expressly reserves the right to reject any Proposal as not responsive if, in its opinion, considering the work to be performed, the facts, as to the bidder's business or technical organization, plant, financial and other sources of business experience compared with the work bid upon, justify rejection.
- (4) The award of the Contract shall not be construed as a guarantee by the Fund that the plant, equipment and the general scheme of operations and other data submitted by the bidder with or after its Proposal is either adequate or suitable for the satisfactory performance of the work.

Section 10 Required Bonds and Insurance

- (1) Unless otherwise agreed to by the Fund, within ten (10) working days after the receipt of Notice of Award, the Contractor shall procure, execute and deliver to the Fund and maintain, at its own cost and expense:
- a. A Performance Bond and a Labor and Material Bond, both of which Bonds shall be on the form prescribed by the Fund and in an amount not less than 100 percent of the total amount of the Contract awarded to the Contractor by the Fund. Said Bonds must be issued by a surety company approved by the Fund and authorized to do business in The State of New York as a surety.
 - b. Proof of insurances with the specific coverage and limits required in Article V of the Agreement. Acceptable documents are:
 - i. Proof of NYS Worker's Compensation is only accepted on the C-105.2 or U-26.3 form.
 - ii. Proof of Disability insurance is only accepted on the DB-120.1 form.

Use the link below for a description of the required forms for Workers Compensation and Disability:

<http://www.osc.state.ny.us/agencies/guide/MyWebHelp/Content/XI/18/G.htm>

- iii. All other proof of insurance must be on the Acord 25 Certificate of Liability Insurance form. Only an original (wet) signature is accepted. Stamped or digitized signatures (fax or email) are not acceptable.
 - c. The 120-day Schedule required by the General Requirements, Special Conditions paragraph 01 32 16, titled "Project Schedule."
- (2) Attorneys-in-fact who execute said Bonds on behalf of a surety must affix thereto a certified and effectively dated copy of their power of appointment.

Section 11 Requirements and Procedures for Participation by New York State - Certified Minority and Women -Owned Business Enterprises and Equal Employment Opportunities for Minority Group Members and Women

(1) New York State Law

Pursuant to New York State Executive Law Article 15-A and Parts 140-145 of Title 5 of the New York Codes, Rules and Regulations, the Fund is required to promote opportunities for the maximum feasible participation of New York State-certified Minority and Women-owned Business Enterprises ("MWBEs") and the employment of minority group members and women in the performance of the Fund contracts.

(2) Business Participation Opportunities for MWBEs

- a. For purposes of this solicitation, the Fund hereby establishes goals (see Section 01 26 43 Amendments (Section E) of the General Requirements for goals) for New York State-certified Minority-owned Business Enterprise ("MBE") participation and for New York State-certified Women-owned Business Enterprise ("WBE") participation (based on the current availability of MBEs and WBEs). A contractor ("Contractor") on any contract resulting from this procurement ("Contract") must document its good faith efforts to provide meaningful participation by MWBEs as subcontractors and suppliers in the performance of the Contract. To that end, by submitting a bid, the bidder agrees that the Fund may withhold payment pursuant to any Contract awarded as a result of this bid pending receipt of the required MWBE documentation. A directory of MWBEs can be viewed at: <https://ny.newnycontracts.com>. For guidance on how the Fund will evaluate a Contractor's "good faith efforts," refer to 5 NYCRR § 142.8 and Article VI, Section 6.03(2)d of the Agreement.
- b. The bidder understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR § 140.1, may be applied towards the achievement of the applicable MWBE participation goal. The portion of a contract with an MWBE serving as a supplier that shall

be deemed to represent the commercially useful function performed by the MWBE shall be 60 percent of the total value of the contract. The portion of a contract with an MWBE serving as a broker that shall be deemed to represent the commercially useful function performed by the MWBE shall be the monetary value for fees, or the markup percentage, charged by the MWBE.

- c. In accordance with 5 NYCRR § 142.13, the bidder further acknowledges that if it is found to have willfully and intentionally failed to comply with the MWBE participation goals set forth in a Contract resulting from this RFP, such finding constitutes a breach of contract and the Fund may withhold payment as liquidated damages.
- d. Such liquidated damages shall be calculated as an amount equaling the difference between: (1) all sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and (2) all sums actually paid to MWBEs for work performed or materials supplied under the Contract.
- e. By submitting a bid or proposal, a bidder agrees to demonstrate its good faith efforts to achieve the applicable MWBE participation goals by submitting evidence thereof in a format prescribed by the Fund.
- f. Additionally, a bidder will be required to submit the following documents and information as evidence of compliance with the foregoing:
 - i. An MWBE Utilization Plan in accordance with paragraph (3) of the above Section 8 Submission of Post Bid Information. Any modifications or changes to an accepted MWBE Utilization Plan after the Contract award and during the term of the Contract must be reported on a revised MWBE Utilization Plan and submitted to the Fund for review and approval.
 - ii. The Fund will review the submitted MWBE Utilization Plan and advise the bidder of the Fund acceptance or issue a notice of deficiency within 30 calendar days of receipt.
 - iii. If a notice of deficiency is issued, the bidder will be required to respond to the notice of deficiency within seven (7) business days of receipt by submitting to the Fund a written remedy in response to the notice of deficiency. If the written remedy that is submitted is not timely or is found by the Fund to be inadequate, the Fund shall notify the bidder within five (5) business days and direct them accordingly. Failure to cooperate with the Fund in a timely manner may be grounds for disqualification of the bid or proposal.
- g. The Fund may disqualify a bidder as being non-responsive under the following circumstances:
 - i. If a bidder fails to submit an MWBE Utilization Plan;

- ii. If a bidder fails to submit a written remedy to a notice of deficiency;
 - iii. If a bidder fails to cooperate with the Fund; or
 - iv. If the Fund determines that the bidder has failed to document good faith efforts.
- h. The successful bidder will be required to attempt to utilize, in good faith, any MBE or WBE identified within its MWBE Utilization Plan, during the performance of the Contract. Requests for a partial or total waiver of established goal requirements made subsequent to Contract Award may be made at any time during the term of the Contract to the Fund, but must be made no later than prior to the submission of a request for final payment on the Contract.
- i. Over the term of the Contract, the successful bidder will be required to submit to the Fund a monthly M/WBE Contractor Compliance & Payment Reporting in the electronic format prescribed by the Fund, documenting the progress made toward achievement of the MWBE goals of the Contract.

(3) Equal Employment Opportunity Requirements

- a. By submission of a bid in response to this solicitation, the bidder agrees with all of the terms and conditions of Schedule "A" - Provisions Required to Be Inserted by Law, including Clause 11 - Equal Employment Opportunities for Minorities and Women. The bidder is required to ensure that it and any subcontractors awarded a subcontract for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work"), except where the Work is for the beneficial use of the bidder, undertake or continue programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, equal opportunity shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, termination, and rates of pay or other forms of compensation. This requirement does not apply to: (i) work, goods, or services unrelated to the Contract; or (ii) employment outside New York State.
- b. The bidder will be required to submit an Equal Employment Opportunity Policy Statement in accordance with paragraph (4) of the above Section 8 Submission of Post Bid Information.
- c. If awarded a Contract, bidder shall submit a Monthly Employment Utilization Report and shall require each of its subcontractors to submit a Monthly Employment Utilization Report in the electronic format prescribed by the Fund during the term of the Contract.
- d. Further, pursuant to Article 15 of the Executive Law (the "Human Rights Law"), all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor and sub-contractors will not discriminate against any

employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

(4) Reports, Records and Documentation

- a. The Contractor shall file with the Fund monthly reports in the electronic form prescribed by the Fund regarding actions taken pursuant to this Section as well as a list of and value of subcontracts and supply contracts.
- b. The Contractor shall permit access to its books, records and accounts by the Fund for purposes of investigation to ascertain compliance with the provisions of this Section. The Contractor shall include this provision in every subcontract so that such provision will be binding upon each subcontractor.
- c. Failure to comply with the foregoing requirements entitles the Fund to take such action as the withholding of funds, suspension or termination of the Contract or such other actions or enforcement proceedings as allowed by the Contract. Such failure may also result in a finding of non-responsiveness, non-responsibility and/or a breach of the Contract.

Section 12 Service-Disabled Veteran-Owned Businesses (SDVOBs)

Article 17-B of the Executive Law enacted in 2014 acknowledges that Service-Disabled Veteran-Owned Businesses (SDVOBs) strongly contribute to the economies of the State and the nation. As defenders of our nation and in recognition of their economic activity in doing business in New York State, bidders are strongly encouraged and expected to consider SDVOBs in the fulfillment of the requirements of the project. Such partnering may be as subcontractors, subconsultants, suppliers, protégés or other supporting roles. SDVOBs can be readily identified on the directory of certified businesses at http://ogs.ny.gov/Core/docs/CertifiedNYS_SDVOB.pdf.

- a. Bidders are strongly encouraged to the maximum extent practical and consistent with legal requirements of the State Finance Law and the Executive Law, to use responsible and responsive SDVOBs as subcontractors to provide meaningful participation. Furthermore, bidders are reminded that they must continue to utilize small, minority and women-owned businesses consistent with Article 15-A of Executive Law. Utilizing SDVOBs in State contracts will help create more private sector jobs, rebuild New York State's infrastructure, and maximize economic activity to the mutual benefit of the bidder and its SDVOB partners. SDVOBs will promote the bidder's optimal performance under any potential agreements, thereby fully benefiting the public sector programs that are supported by associated public procurements.

- b. Public procurements can drive and improve the State's economic engine through promotion of the use of SDVOBs by its bidders. The State, therefore, expects bidders to provide maximum assistance to SDVOBs in the performance of any potential agreement. The potential participation by all kinds of SDVOBs will deliver great value to the State and its taxpayers.

Section 13 Encouraging Use of New York State Business Businesses in Contract Performance

New York State businesses have a substantial presence in State contracts and strongly contribute to the economies of the state and the nation. In recognition of their economic activity and leadership in doing business in New York State, bidders/proposers for this contract for commodities, services or technology are strongly encouraged and expected to consider New York State businesses in the fulfillment of the requirements of the contract. Such partnering may be as subcontractors, suppliers, protégés or other supporting roles.

Bidders/proposers need to be aware that all authorized users of this contract will be strongly encouraged, to the maximum extent practical and consistent with legal requirements, to use responsible and responsive New York State businesses in purchasing commodities that are of equal quality and functionality and in utilizing services and technology. Furthermore, bidders/proposers are reminded that they must continue to utilize small, minority and women-owned businesses, consistent with current State law.

Utilizing New York State businesses in State contracts will help create more private sector jobs, rebuild New York's infrastructure, and maximize economic activity to the mutual benefit of the Contractor and its New York State business partners. New York State businesses will promote the Contractor's optimal performance under the contract, thereby fully benefiting the public sector programs that are supported by associated procurements.

Public procurements can drive and improve the State's economic engine through promotion of the use of New York businesses by its Contractors. The State therefore expects bidders/proposers to provide maximum assistance to New York businesses in their use of the contract. The potential participation by all kinds of New York businesses will deliver great value to the State and its taxpayers.

- (1) Information on the availability of New York State subcontractors and suppliers is available from: New York State Department of Economic Development, Procurement Assistance Unit, One Commerce Plaza, Albany, New York 12245, Phone: (518) 474-7756, Fax: (518) 486-7577.

Section 14 Single Contract Responsibility

This is a single bid general construction project. The Contractor submitting the bid is responsible for all work associated with this Project.

Section 15 Examination of Site

A pre-bid conference will be held on 02/25/2021 with all bidders, subcontractors and other planholders at the time and place specified in Section 00 25 13 Pre-Bid Meetings. No individual or additional walk-throughs will be provided. Failure to attend a walk-through shall not be the cause for extra payment.

Section 16 Procurement Lobbying Law Restrictions

Please be advised that State Finance Law Sections 139-j and 139-k include and impose certain restrictions on communications between the Fund and Bidders during the procurement process. A bidder is restricted from making contacts from the earliest notice of intent to solicit offers through receipt of the Notice to Proceed ("restricted period") to other than designated staff, unless it is a contact that is included among certain statutory exceptions set forth in State Finance Law Sections 139-j(3)(a). Designated staff is identified in the Notice to Bidders as of the date hereof. Fund employees are also required to obtain certain information when contacted during the restricted period and make a determination of the responsibility of the bidder pursuant to these two statutes. Certain findings of non-responsibility can result in rejection for contract award and in the event of two findings within a 4-year period, the Offerer/bidder is debarred from obtaining governmental Procurement contracts.

Bidders must also disclose whether any governmental entity has made a finding of non-responsibility within the previous four years based upon the failure to comply with Section 139-j of the State Finance Law or intentionally providing false or incomplete information to a governmental entity. The Form for this disclosure is on the last page of the Proposal and the bidder must fill out and sign this Form.

Further information about these requirements can be found on the State Office of General Services website (<https://ogs.ny.gov/ACPL/>) and the Fund website (<https://sucf.suny.edu/opportunities/procurement-lobbying-act-policy-and-procedures>).

Section 17 Requirements for Construction Activities To Address Public Health or Safety

The Bidder expressly understands and agrees that it accepts the risk that all Project work includes the uncertainties of complying with government requirements issued to protect public health and safety. As such, the Bidder agrees it is responsible for complying with any and all such requirements as may be issued by federal, state or local entities, including but not limited to New York State Governor Office Executive Orders, New York State Department of Health rules, regulations and guidance, and other New York State or Fund laws, rules, regulations or recommendations that may be issued and/or amended during the bidding and/or performance of work on this Project.

Bidder further acknowledges that its bid for this Project includes the costs necessary for such compliance.

With respect to the COVID-19 pandemic, Bidder specifically acknowledges and agrees that the NYS Interim COVID-19 Guidance for Construction Projects, as may be amended or superseded, is made a part of the contract work for this Project, as set forth in General Requirements Section 01 35 29 10. Bidder affirms that all costs and time associated with compliance with this guidance are included in its bid. The current NYS Interim COVID-19 Guidance for Construction Projects for is available at the following website: <https://forward.ny.gov/industries-reopening-phase#phase-one-construction>

MWBE and SDVOB BUSINESS REQUIREMENTS FOR PROSPECTIVE BIDDERS

Consistent with the Fund's commitment and in accordance with Article 15-A and Article 17-B of the New York State Executive Law, contractors are required to ensure that good faith efforts are made to include meaningful participation by Minority and Women-Owned Businesses (MWBE) and Service Disabled Veteran-owned Businesses (SDVOB) in the Fund's construction program. The requirements apply to all Fund contracts in excess of \$100,000. The intent of the program is to encourage and assist in developing business relationships between prime contractors, MWBE and SDVOB subcontractors and suppliers. Contractors must be diligent and creative in order to develop a plan that complies with the program.

Receipt of the MWBE and SDVOB Utilization Plan is required within seven (7) calendar days after the bid opening. The MWBE and SDVOB firms listed on the Plan (s) are businesses the bidder intends to utilize on the project and are subject to verification by the Fund.

For many projects, it may be necessary to solicit the cooperation of principal subcontractors to assist in developing a meaningful utilization plan. In order for good faith efforts to be effective, contractors should begin plan development during pre-bid. A matter of special consequence is the Fund's contract requirement that principal subcontractors are nominated within 48 hours of the bid opening therefore, in the selection of principal subcontractors, the prime contractor should consider subcontractors who demonstrate efforts to assist with program requirements.

Consequently, we recommend that the prime contractor evaluate the level of MWBE and SDVOB participation and the good faith efforts to be provided by their principal subcontractors. Although ultimate responsibility for program compliance is with the prime contractor, the Contract Documents require that all subcontractors also comply with the contract provisions. **An inability to meet the contractual goals when subcontractor cooperation is not present, does not excuse the prime contractor from the responsibility.**

MWBE firms must be currently certified by New York State Department of Economic Development Corp. (ESDC) as a Minority or Women-Owned Business to comply with the program requirements. Certified firms are included in the Directory of Certified Minority and Women-Owned Business Enterprises. The Directory is available on the Internet at <https://ny.newnycontracts.com/>. It is the responsibility of the contractor to ensure firms are included in the Directory at the time of submission.

SDVOB firms must be certified by the Office of General Services, Division of Service-Disabled Veterans' Business Development to comply with the program requirements. Certified firms are included in a Directory of New York State Certified Service-Disabled Veteran-Owned Businesses. The Directory is available on the Internet at <https://online.ogs.ny.gov/SDVOB/search>

MWBE and SDVOB goals are separate and cannot be substituted one for the other. However, firms that hold both MWBE and SDVOB certifications may be included in both the MWBE and SDVOB Utilization Plans toward satisfaction of both goals.

The actual services provided by the MWBE and SDVOB firms must be essential in the performance of the scope of work for the applicable contract. **Utilization of a certified MWBE OR SDVOB firm as a conduit or pass through for participation credit is strictly prohibited.** It is the discretion of the Fund to determine whether services are essential in the performance of the scope of work and/or the appropriateness of work allowed for lower tier subcontracting in accordance with practices generally accepted in the construction industry. The services the MWBE and/or SDVOB firm will provide must be among those explicitly identified in the profile (codes) of firms as listed in the NYS Directory of MWBE and/or SDVOB firms respectively. Firms submitted or who participate in the project outside of these conditions and without specific prior approval by the Fund will not be credited toward the Utilization Plan goals for the contract.

If you have questions or need assistance related to the Fund's Minority and Women's Business requirements call the Opportunities Program Unit at (518) 320-1650 or email SUCF.OpportunityAdmin@suny.edu

MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES

“GOOD FAITH EFFORTS” GUIDELINES

Construction contracts covered by Executive Law Article 15-A

Contractors are required to ensure that good faith efforts are made to include meaningful participation by Minority and Women-Owned Business Enterprises (MWBE) in the Fund’s construction program. Contractors must be diligent and creative in order to develop a plan that complies with the program. If your firm incurs difficulty, these Guidelines will assist in preparing the documentation required to support your efforts. Responses to the information in the Guidelines must be provided to the Fund’s Opportunities Programs Office in an item-by-item format following the numerical sequence as presented. If you need assistance, please contact the office at: (518) 320-1650.

GUIDELINES:

1. Provide a brief statement of any special circumstances which are preventing NYS certified MWBE firms from participating. Include any documentation you deem relevant which may help us in evaluating your efforts.
2. The names of general circulation, trade association, and MWBE-oriented publications in which you solicited certified MWBEs for the purposes of complying with your participation goals related to this contract. Include a list identifying the date(s) that all solicitations for certified MWBE participation were published in any of the above publications.
3. A list of all certified MWBEs appearing in the NYS Directory of Certified Firms <https://ny.newnycontracts.com/> that were solicited for purposes of complying with your certified MWBE participation levels.
4. Copies of notices, dates of contact, letters, and other correspondence as proof that solicitations were made in writing and copies of such solicitations.
5. Telephone logs with details including date, person(s) communicated with and outcome.
6. Provide copies of responses to your solicitations received by you from certified MWBEs.
7. Provide a description of any contract documents, plans, or specifications made available to certified MWBEs for purposes of soliciting their bids and the date and manner in which these documents were made available.
8. Provide documentation of any negotiations between you and the MWBEs undertaken for purposes of complying with the certified MWBE participation goals.
9. Provide documentation to substantiate quotes that were submitted by NYS certified MWBE firms that were deemed as too high or not cost effective.
10. List efforts made to reasonably structure the scopes of work for purposes of subcontracting with NYS certified MWBEs.
11. Provide a list and include the dates of any pre-bid, pre-award, or other events attended with NYS certified MWBE firms

MWBE UTILIZATION PLAN FORM (UP-1) INSTRUCTIONS

The MWBE Utilization Plan (UP-1) is required to be submitted by the three low bidders within seven (7) calendar days after the bid opening. The ideal Plan should include a mix of MBE and WBE subcontractor and supplier participation. However, if either goal includes more than one third in supplies/material a compelling explanation should be attached. Submission of a Plan which fails to at least meet each goal shall be accompanied by documentation of specific efforts undertaken both pre and post bid. (see “good faith efforts” guidelines)

The Contractor will be required the contractor to provide sufficient documentation of the efforts made in the development of the MWBE Plan. The documentation should be responsive to “good faith efforts” guidelines and demonstrate the contractor’s commitment to providing opportunities for MBE and WBE firms in the development of the Plan.

The Fund will review the MWBE Utilization Plan and notify the contractor of any deficiencies and determine necessary actions to bring the Plan into compliance. The firms listed will be contacted for verification of participation. A copy of the approved Plan will be provided to the contractor after issuance of the Fund’s Notice of Award. **Be advised, The Fund does not issue its Notice of Award without an approved MWBE Plan and the Construction Contract may be withheld.**

For assistance with the directory and/or questions regarding the Utilization Plan (UP-1) contact the Opportunities Program Office at (518) 320-1650 or via e-mail:
SUCF.OpportunityAdmin@suny.edu.

Submit Initial Plan to: Peggy McSorley, Confidential Assistant
Peggy.McSorley@suny.edu

Submit Plan Modifications to: SUCF.OpportunityAdmin@suny.edu.

MWBE UTILIZATION PLAN FORM (UP-1) INSTRUCTIONS

Only firms holding “current” New York State certification status are acceptable for participation credit.

INITIAL PLAN	Initial Utilization Plan submittal
PLAN MODIFICATION	Update to the Approved Plan
CONTRACT INFORMATION	Project Number, Contract Number, Bid Date, Contract Award Value, MWBE Contract Goals
CONTRACTOR INFORMATION	Company Name, Company Address, Contact Name, Contact Title, Phone, Fax, Email
SUBCONTRACTOR INFORMATION	<p>List the MBE and WBE firms your firm intends to utilize on the project. Include the Company Name, Street Address, Contact Name, and Email Address. Check the appropriate box: MBE <u>or</u> WBE.</p> <p>*Dual certified firms may be used as either but <u>not</u> both within their certification product code. MBE and WBE firms must be certified by the NYS Department of Economic Development, Division of Minority and Women Business Development. The directory of certified Minority and Women-owned Business Enterprises is available on the internet at http://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp.</p>
CONTRACT WITH	Indicate if the participation is via a subcontractor and not direct from prime. Prime contractor is responsible for ensuring participation included in the Plan by subcontractors is executed.
MODIFICATION TYPE (if applicable)	<p>*Prior approval must be obtained from the Fund for decrease in participation or deletion of a firm. A letter of explanation is required on page 2. Supporting documentation of efforts must be submitted to the Fund, with the explanation.</p> <ul style="list-style-type: none"> ▪ NO CHANGE - for firms on the approved plan with no modifications to report. ▪ ADD – for firms that you are adding to the plan. ▪ DELETE – for firms you are removing from the original approved plan. For any deletions or decreases in subcontract value, an explanation is required on page 2. ▪ UPDATE – for firms whose value is being modified from original utilization plan, decreases to original plan value, an explanation is required on page 2.
FEDERAL I.D. NUMBER	Provide an <u>accurate</u> federal identification number for each MBE / WBE subcontractor or supplier.
DESCRIPTION OF WORK	<p>Provide a brief, but specific description of work to be performed or supplies to be purchased from the MBE or WBE subcontractor or supplier.</p> <p>Check the appropriate box Subcontractor, Supplier, or Broker</p> <p><u>Construction Supplier</u> - 60% credit: Firms that sell goods out of their revolving inventory.</p> <p><u>Brokers/Construction Manufacturers’ Representatives</u> – Credit is the monetary value for fees, or the markup percentage, charged by the MWBE. Firms serving as a third-party intermediary between consumers of items and manufacturers, suppliers, or other entities.</p> <p>The services the MBE or WBE will provide must be among those explicitly identified in the firm’s profile (codes) as listed in the NYS MWBE Directory of Certified Firms (https://ny.newnycontracts.com). Firms who participate in the project outside of these conditions <u>will not</u> be credited toward the MWBE Utilization Plan and goals for the contract.</p>
INITIAL PLAN VALUE	Total value of the signed Subcontract
MODIFIED PLAN VALUE	Total value of the revision to the signed Subcontract. Prior approval must be obtained from the Fund for a decrease in participation or deletion of a firm. A letter of explanation is required on page 2. Supporting documentation of efforts must be submitted to the Fund, with the explanation.
SUBCONTRACTOR/SUPPLIER SCHEDULE	<p>The anticipated start and completion dates for each MBE WBE subcontractor or supplier.</p> <p>*Do not include the overall construction schedule for the life of the entire project.</p>
SIGNATURE	Provide the Name, Title and Email address and Signature of a Company Officer.

OPPORTUNITIES PROGRAM OFFICE MWBE UTILIZATION PLAN (UP-1)

SUCF Project No.: _____

☐ Initial Plan ☐ Plan Modification

Contract No.: _____ Bid Date: _____ Contract Award Value (base bid + alternates): _____ Goals: MBE% _____ WBE% _____

Contractor: _____ Address: _____

Contact Name & Title: _____

Phone: _____ Fax: _____ E-mail: _____

Subcontractor Name, Address & E-mail	Check One (if applicable)	Federal ID No.	Description of Work or Supplies	Initial Plan Value	Modified Plan Value*	Subcontractor/Supplier Schedule	
						Start Date	End Date
Company Name: Street Address: Contact Name: E-mail address: <input type="checkbox"/> MBE <input type="checkbox"/> WBE Contract with: _____	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE		<input type="checkbox"/> Subcontractor <input type="checkbox"/> Supplier <input type="checkbox"/> Broker				
Company Name: Street Address: Contact Name: E-mail address: <input type="checkbox"/> MBE <input type="checkbox"/> WBE Contract with: _____	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE		<input type="checkbox"/> Subcontractor <input type="checkbox"/> Supplier <input type="checkbox"/> Broker				
Company Name: Street Address: Contact Name: E-mail address: <input type="checkbox"/> MBE <input type="checkbox"/> WBE Contract with: _____	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE		<input type="checkbox"/> Subcontractor <input type="checkbox"/> Supplier <input type="checkbox"/> Broker				
Company Name: Street Address: Contact Name: E-mail address: <input type="checkbox"/> MBE <input type="checkbox"/> WBE Contract with: _____	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE		<input type="checkbox"/> Subcontractor <input type="checkbox"/> Supplier <input type="checkbox"/> Broker				

In accordance with the Fund's Contract Documents and Executive Law Article 15-A, my firm intends to utilize the NYS certified MBE/WBE firms listed above for the services and/or supplies indicated on the Plan. I understand the firms listed may be contacted for verification of participation. False representations may result in penalties including but not limited to, withholding of payments and/or termination of this agreement. I understand that I must immediately notify the Opportunities Program Office and request approval prior to any changes to this Plan.

Print Name & Title _____

Company Officer's Signature _____

Director, Opportunities Program _____

Date _____

E-mail _____

Date _____

SUCF Project No.: _____ Contract No.: _____ Contractor: _____

***If the Utilization Plan Modification reflects a decrease in value from the original plan or if a firm is substituted, please provide a detailed explanation below and attach supporting documentation.**

<u>Subcontractor Name</u>	<u>Certification Type</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Certification Type</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Certification Type</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Certification Type</u>	<u>Explanation</u>

In accordance with the Fund's Contract Documents and Executive Law Article 15-A, my firm intends to utilize the NYS certified MBE/WBE firms listed above for the services and/or supplies indicated on the Plan. I understand the firms listed may be contacted for verification of participation. False representations may result in penalties including but not limited to, withholding of payments and/or termination of this agreement. I understand that I must immediately notify the Opportunities Program Office and request approval prior to any changes to this Plan.

Print Name & Title _____

Company Officer's Signature _____

Director, Opportunities Program _____

Date _____

E-mail _____

Date _____

MWBE and SDVOB BUSINESS REQUIREMENTS FOR PROSPECTIVE BIDDERS

Consistent with the Fund's commitment and in accordance with Article 15-A and Article 17-B of the New York State Executive Law, contractors are required to ensure that good faith efforts are made to include meaningful participation by Minority and Women-Owned Businesses (MWBE) and Service Disabled Veteran-owned Businesses (SDVOB) in the Fund's construction program. The requirements apply to all Fund contracts in excess of \$100,000. The intent of the program is to encourage and assist in developing business relationships between prime contractors, MWBE and SDVOB subcontractors and suppliers. Contractors must be diligent and creative in order to develop a plan that complies with the program.

Receipt of the MWBE and SDVOB Utilization Plan is required within seven (7) calendar days after the bid opening. The MWBE and SDVOB firms listed on the Plan (s) are businesses the bidder intends to utilize on the project and are subject to verification by the Fund.

For many projects, it may be necessary to solicit the cooperation of principal subcontractors to assist in developing a meaningful utilization plan. In order for good faith efforts to be effective, contractors should begin plan development during pre-bid. A matter of special consequence is the Fund's contract requirement that principal subcontractors are nominated within 48 hours of the bid opening therefore, in the selection of principal subcontractors, the prime contractor should consider subcontractors who demonstrate efforts to assist with program requirements.

Consequently, we recommend that the prime contractor evaluate the level of MWBE and SDVOB participation and the good faith efforts to be provided by their principal subcontractors. Although ultimate responsibility for program compliance is with the prime contractor, the Contract Documents require that all subcontractors also comply with the contract provisions. **An inability to meet the contractual goals when subcontractor cooperation is not present, does not excuse the prime contractor from the responsibility.**

MWBE firms must be currently certified by New York State Department of Economic Development Corp. (ESDC) as a Minority or Women-Owned Business to comply with the program requirements. Certified firms are included in the Directory of Certified Minority and Women-Owned Business Enterprises. The Directory is available on the Internet at <https://ny.newnycontracts.com/>. It is the responsibility of the contractor to ensure firms are included in the Directory at the time of submission.

SDVOB firms must be certified by the Office of General Services, Division of Service-Disabled Veterans' Business Development to comply with the program requirements. Certified firms are included in a Directory of New York State Certified Service-Disabled Veteran-Owned Businesses. The Directory is available on the Internet at <https://online.ogs.ny.gov/SDVOB/search>

MWBE and SDVOB goals are separate and cannot be substituted one for the other. However, firms that hold both MWBE and SDVOB certifications may be included in both the MWBE and SDVOB Utilization Plans toward satisfaction of both goals.

The actual services provided by the MWBE and SDVOB firms must be essential in the performance of the scope of work for the applicable contract. **Utilization of a certified MWBE OR SDVOB firm as a conduit or pass through for participation credit is strictly prohibited.** It is the discretion of the Fund to determine whether services are essential in the performance of the scope of work and/or the appropriateness of work allowed for lower tier subcontracting in accordance with practices generally accepted in the construction industry. The services the MWBE and/or SDVOB firm will provide must be among those explicitly identified in the profile (codes) of firms as listed in the NYS Directory of MWBE and/or SDVOB firms respectively. Firms submitted or who participate in the project outside of these conditions and without specific prior approval by the Fund will not be credited toward the Utilization Plan goals for the contract.

If you have questions or need assistance related to the Fund's Minority and Women's Business requirements call the Opportunities Program Unit at (518) 320-1650 or email SUCF.OpportunityAdmin@suny.edu

SERVICE-DISABLED VETERANS-OWNED BUSINESSES

“GOOD FAITH EFFORTS” GUIDELINES

Construction contracts covered by Executive Law Article 17-B

Contractors are required to ensure that good faith efforts are made to include meaningful participation by Service-Disabled Veterans-Owned Businesses (SDVOB) in the Fund’s construction program. Contractors must be diligent and creative in order to develop a plan that complies with the program. If your firm incurs difficulty, these Guidelines will assist in preparing the documentation required to support your efforts. Responses to the information in the Guidelines must be provided to the Funds’ Opportunities Programs Office in an item-by-item format following the numerical sequence as presented. If you need assistance, please contact the office at: (518) 320-1650.

GUIDELINES:

1. Provide a brief statement of any special circumstances which are preventing NYS certified SDVOB firms from participating.
2. Provide the names of general circulation, trade association, and SDVOB-oriented publications in which you solicited certified SDVOBs for the purposes of complying with your participation goals related to this contract. Include a list identifying the date(s) that all solicitations for certified SDVOB participation were published in any of the above publications.
3. A list of all certified SDVOBs appearing in the OGS Division of Service-Disabled Veterans' Business Development's Directory <https://online.ogs.ny.gov/SDVOB/search> that were solicited for purposes of complying with your certified SDVOB participation levels.
4. Copies of notices, dates of contact, letters, and other correspondence as proof that solicitations were made in writing and copies of such solicitations.
5. Telephone logs with details including date, person(s) communicated with and outcome.
6. Provide copies of responses to your solicitations received by you from certified SDVOBs.
7. Provide a description of any contract documents, plans, or specifications made available to certified SDVOBs for purposes of soliciting their bids and the date and manner in which these documents were made available.
8. Provide documentation of any negotiations between you and the SDVOBs undertaken for purposes of complying with the certified SDVOB participation goals.
9. Provide documentation to substantiate quotes that were submitted by NYS certified SDVOB firms that were deemed as too high or not cost effective.
10. List efforts made to reasonably structure the scopes of work for purposes of subcontracting with NYS certified SDVOBs.
11. Provide a list and include the dates of any pre-bid, pre-award, or other events attended with NYS certified SDVOB firms.

SDVOB UTILIZATION PLAN FORM INSTRUCTIONS

The SDVOB Utilization Plan is required to be submitted by the three low bidders within seven (7) calendar days after the bid opening. Submission of a Plan which fails to at least meet each goal shall be accompanied by documentation of specific efforts undertaken both pre and post bid. (See “good faith efforts” guideline)

The Contractor will be required the contractor to provide sufficient documentation of the efforts made in the development of the SDVOB Plan. The documentation should be responsive to “good faith efforts” guidelines and demonstrate the contractor’s commitment to providing opportunities to SDVOB firms in the development of the Plan.

The Fund will review the SDVOB Utilization Plan and notify the contractor of any deficiencies and determine necessary actions to bring the Plan into compliance. The firms listed will be contacted for verification of participation. A copy of the approved Plan will be provided to the contractor after issuance of the Fund’s Notice of Award.

For assistance with the directory and/or questions regarding the SDVOB Utilization Plan contact the Opportunities Program Office at (518) 320-1650 or via e-mail:

SUCF.OpportunityAdmin@suny.edu.

Submit Initial Plan to: Peggy McSorley, Confidential Assistant
Peggy.Mcsorley@suny.edu

Submit Plan Modifications to: SUCF.OpportunityAdmin@suny.edu.

SDVOB UTILIZATION PLAN FORM INSTRUCTIONS

Only firms holding “current” New York State certification status are acceptable for participation credit

INITIAL PLAN	Initial Utilization Plan submittal
PLAN MODIFICATION	Update to the Approved Plan
CONTRACT INFORMATION	Project Number, Contract Number, Contract Award Value, Bid Date, SDVOB Contract Goal
CONTRACTOR INFORMATION	Company Name, Federal I.D., Address, Contact Name/Title, Phone, Fax, Email
SUBCONTRACTOR INFORMATION	<p>List the SDVOB firms your firm intends to utilize on the project. Include the Company Name, Street Address, Contact Name, and Email Address.</p> <p>SDVOB firms must be certified by the Office of General Services, Division of Service-Disabled Veterans’ Business Development to comply with the program requirements. Certified firms are included in a Directory of New York State Certified Service-Disabled Veteran-Owned Businesses. The Directory is available on the Internet at https://online.ogs.ny.gov/SDVOB/search</p>
CONTRACT WITH	Indicate if the participation is via a subcontractor and not direct from prime. Prime contractor is responsible for ensuring participation included in the Plan by subcontractors is executed.
MODIFICATION TYPE (if applicable)	<p>*Prior approval must be obtained from the Fund for decrease in participation or deletion of a firm. A letter of explanation is required on page 2. Supporting documentation of efforts must be submitted to the Fund, with the explanation.</p> <ul style="list-style-type: none"> ▪ NO CHANGE - for firms on the approved plan with no modifications to report. ▪ ADD – for firms that you are adding to the plan. ▪ DELETE – for firms you are removing from the original approved plan. For any deletions or decreases in subcontract value, an explanation is required on page 2. ▪ UPDATE – for firms whose value is being modified from original utilization plan, decreases to original plan value, an explanation is required on page 2.
FEDERAL I.D. NUMBER	Provide an <u>accurate</u> federal identification number for each SDVOB subcontractor or supplier.
DESCRIPTION OF WORK	<p>Provide a brief, but specific description of work to be performed or supplies to be purchased from the SDVOB subcontractor or supplier.</p> <p>The utilization of NYS certified Service-Disabled Veteran-owned Business Enterprises for non-commercially use function will not be counted toward goal credit on the utilization plan.</p>
INITIAL PLAN VALUE	Total value of the signed Subcontract
MODIFIED PLAN VALUE	Total value of the revision to the signed Subcontract. Prior approval must be obtained from the Fund for a decrease in participation or deletion of a firm. A letter of explanation is required on page 2. Supporting documentation of efforts must be submitted to the Fund, with the explanation.
SUBCONTRACTOR/SUPPLIER SCHEDULE	<p>The anticipated start and completion dates for each SDVOB subcontractor or supplier.</p> <p>*Do not include the overall construction schedule for the life of the entire project.</p>
SIGNATURE	Provide the Name, Title and Email address and Signature of a Company Officer.

OPPORTUNITIES PROGRAM OFFICE SDVOB UTILIZATION PLAN

SUCF Project No.: _____

☐ Initial Plan ☐ Plan Modification

SDVOB Goal % _____

Contract No.: _____ **Contract Award Value** (base bid + alternates): _____ **Bid Date:** _____

Are you a NYS Certified SDVOB?

Contractor: _____ **Federal I.D.** _____

☐ Yes ☐ No

Address: _____ **Contact Name & Title:** _____ **DSDVBD Control#**

Phone: _____ **Fax:** _____ **E-mail:** _____

Subcontractor Name, Address & E-mail	Check One (if applicable)	Federal ID No.	Description of Work or Supplies	Initial Plan Value	Modified Plan Value*	Subcontractor/Supplier Schedule	
						Start Date	End Date
Company Name: Street Address: Contact Name: E-mail address: Contract with:	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE						
Company Name: Street Address: Contact Name: E-mail address: Contract with:	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE						
Company Name: Street Address: Contact Name: E-mail address: Contract with:	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE						
Company Name: Street Address: Contact Name: E-mail address: Contract with:	<input type="checkbox"/> NO CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE <input type="checkbox"/> UPDATE						

In accordance with the Fund's Contract Documents and Executive Law Article 17-B, my firm intends to utilize the NYS certified SDVOB firms listed above for the services and/or supplies indicated on the Plan. I understand the firms listed may be contacted for verification of participation. False representations may result in penalties including but not limited to, withholding of payments and/or termination of this agreement. I understand that I must immediately notify the Opportunities Program Office and request approval prior to any changes to this Plan.

Print Name & Title _____

Company Officer's Signature _____

Director, Opportunities Program _____

Date _____

E-mail _____

Date _____

SUCF Project No.: _____ Contract No.: _____ Contractor: _____

If the Utilization Plan Modification reflects a decrease in value from the original plan or if a firm is substituted, please provide a detailed explanation below and attach supporting documentation.

<u>Subcontractor Name</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Explanation</u>
<u>Subcontractor Name</u>	<u>Explanation</u>

In accordance with the Fund's Contract Documents and Executive Law Article 17-B, my firm intends to utilize the NYS certified SDVOB firms listed above for the services and/or supplies indicated on the Plan. I understand the firms listed may be contacted for verification of participation. False representations may result in penalties including but not limited to, withholding of payments and/or termination of this agreement. I understand that I must immediately notify the Opportunities Program Office and request approval prior to any changes to this Plan.

Print Name & Title _____

Company Officer's Signature _____

Director, Opportunities Program _____

Date _____

E-mail _____

Date _____

Section 00 25 13 Pre-Bid Meetings

A pre-bid conference and project walk-through will be held on January 28, 2021 with all Bidders assembled at 10:00am at the McKenna Theatre, SUNY New Paltz, 1 Hawk Drive, New Paltz, NY 12561. No individual or additional walk-throughs may be performed during the prebid time period. Vehicle parking must comply with campus regulations. Failure to attend a walk-through shall not be the cause for extra payment.

The pre-bid meeting shall be chaired by the Consultant with the following as the minimum agenda:

1. Confirm that bidders have a full bid package including any addenda issued to date.

Please be advised of new standard documents:

- a. For projects bidding after September 1, 2018, see the Agreement dated August 2018 and review it in its entirety.
 - b. For projects advertised after Dec. 1, 2017, Section 01 74 19 Construction Waste Management has been added at the request of the SUNY Sustainability Coalition. Please review the section and consider how to meet its goal for recycling at least 50% of the construction and demolition waste generated by this contract. (Hold questions on scope until item 5 below)
 - c. See Section 11 of 00 21 13 20 Information for Bidders for participation by MBEs and WBEs. The MBE/WBE participation goals for this project are:
 - ____5__ percent for MBE participation
 - ____5__ percent for WBE participation
 - d. See Section 12 of the Information for Bidders for participation by Service-Disabled Veteran-Owned Businesses. The SDVOB goal for this project is _3_%
2. Review the timetable for submitting questions and issuing addenda.
 3. Confirm the bid date and time.
 4. Advise bidders that no changes to the Contract Documents are binding unless included in an addendum.
 5. Review the project scope and schedule. Describe the main concepts of the project.
 - a. Review the list of sole/single source products listed in General Requirements Section 01 26 43 Amendments (if any) and remind bidders that all costs for these products are covered by the base bid and no equivalents will be permitted.
 6. Describe any particular site, access and/or time difficulties related to this project.

7. Refer the bidders to the 00 21 13 20 Contractors Bid and Post Bid Checklist.
 - a. Note that that Sections 7 Qualification of Bidders, 8 Submission of Post Bid Information and 10 Required Bonds in 00 21 13 20 Information for Bidders have been changed.
 - b. Note that all insurance must be provided by companies approved by the Fund, licensed to do business in the State of New York (“admitted” carriers), and rated at least “A-” by A.M. Best Company. Excess line insurers are not acceptable. Bidders must consult their insurance company/agent prior to bidding.
 - i. To clarify how to confirm if a bidder’s insurer is licensed to do business in the State of New York (“admitted” carriers), bidders and their insurance agents should search for their insurance companies at the following website: <https://www.dfs.ny.gov/insurance/tocol4.htm> . To search, select the link titled: “Insurance Company Search”.
 - ii. Excess line insurers are not acceptable and these firms are listed at this website: <http://www.elany.org/nyes.aspx?d=1002> .
 - c. If the Fund issues a Notice of Award and the bidder doesn’t provide acceptable insurance, then the Fund may rescind the award and take other actions to which it is entitled. All resulting costs and time delay are solely the responsibility of the bidder.
8. Note the change lowering the dollar threshold for named subcontractors back to \$20,000.
9. Have a question and answer session.
10. Tour the site and existing conditions.

APPENDIX A

For SUCF Project No. _____081047-00_____

BID BREAKDOWN

In the spaces provided below, insert the bid amounts for the various divisions listed.

<u>DIVISION OR SECTION</u>	<u>AMOUNT</u>
1. Division 1 – General Requirements	\$ _____
2. Division 2 – Existing Conditions	\$ _____
3. Division 3 – Concrete	\$ _____
4. Division 5 – Metals	\$ _____
5. Division 6 – Wood	\$ _____
6. Division 7 – Thermal and Moisture Protection	\$ _____
7. Division 8 – Openings	\$ _____
8. Division 22 – Plumbing	\$ _____
9. Division 23 – HVAC	\$ _____
10. Division 26 – Electrical	\$ _____
11. Sum of all lines above (Base Bid)	\$ _____
12. Field Order Allowance	\$ _____220,000.00_____
Total Bid	\$ _____

1. This breakdown is not the basis for Contractor payment (Agreement Section 4.08).
2. The Total above should equal the amount in the Contractor's bid Proposal.

Note: Please indicate whether you believe that any information supplied herein is confidential and should be exempt from disclosure under the Freedom of Information Law.

☐ Yes

☐ No

If "yes", you must identify the information you feel is confidential by placing an asterisk () in front of the appropriate number(s) and you are requested to attach an additional sheet(s) upon which the basis for such claim(s) is explained.*

Name of Contractor

NAME OF BIDDER

ADDRESS OF BIDDER

00 42 13 **PROPOSAL FOR SUCF PROJECT NO. 081047-00**

Replace Roofs at Smiley Arts Building, College Theatre, Dorsky Museum & Faculty Office Building

SUNY New Paltz

TO THE STATE UNIVERSITY CONSTRUCTION FUND:

1. The Bidder agrees that it shall complete all work necessary for substantial completion within 280 calendar days from receipt of the Notice to Proceed. In the event the bidder fails to complete such work by said date, or within the time to which such completion may have been extended in accordance with the Contract Documents, the bidder agrees to pay the Fund liquidated damages in the sum of \$2,200 for each calendar day of delay in completing the work.
2. The bidder hereby declares that it has carefully examined all Bidding and Contract Documents and that it has inspected the actual location of the work, together with the local sources of supply, has satisfied itself as to all the quantities and conditions, and understands that in signing this Proposal, it waives all right to plead any misunderstanding regarding the same.
3. The bidder further understands and agrees that it is to do, perform and complete all work in accordance with the Contract Documents and to accept in full compensation therefor the amount of the TOTAL BID, modified by such additive or deductive alternates, if any, as are accepted by the Fund.
4. The bidder further agrees to accept the unit prices, if any, set forth in paragraph (5) hereof, except as the same may be modified pursuant to the provisions of Section 5 of the Information to Bidders, as full payment for any deletions, additions, modifications or changes to the portion or portions of work covered by said unit prices.
5. a. **BID CALCULATION:**

- (1) All work including Allowances (if any) listed in 5.d. below and excluding Field Order Allowance

(In words) \$ _____ (In figures)

- (2) Field Order Allowance: Schedule III and Section 4.05A of the Agreement

Two hundred twenty thousand dollars \$ 220,000.00
(In words) (In figures)

- (3) TOTAL BID Add lines (1) and (2)

(In words) \$ _____ (In figures)

- b. **ALTERNATES:** Refer to 01 23 00 Alternates (Section B) of the General Requirements. The bidder proposes the following Additions to or Deductions from the TOTAL BID for the alternatives listed below:

<u>Alternate Number</u>	<u>Add/ Deduct</u>	<u>Amount In Words</u>	<u>Amount In Figures</u>
NONE			

- c. **UNIT PRICES:** The bidder or the Fund may insert unit prices for the work or materials listed below. Refer to Section 5, paragraph (2) of the Information to Bidders, Schedule 1 and Article IV Section 4.04 of the Agreement for clarification. Such unit prices apply solely for additions. The Fund may, however, adjust any unit price filled in by a bidder to an amount agreeable to both the bidder and the Fund, or it may reject any unit price. The amount of any unit price accepted or agreed to by the Fund shall be reduced by 15 percent for any deduction in the work or materials covered by such unit price.

<u>Work or Materials Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
NONE		

- d. **ALLOWANCES:** The bidder further agrees that its TOTAL BID includes the Allowance(s) listed below. Refer to Schedule II and Sections 4.04 and 4.05 of the Agreement for clarification:

<u>Work or Materials Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
NONE		

6. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of his or her knowledge and belief: (a) the prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (b) unless otherwise required by law, the prices have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (c) no attempt has been made or will be made by the bidder to induce any person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

A bid shall not be considered for award nor shall any award be made where (a), (b) and (c) above have not been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefor. Where (a), (b), and (c) above shall have not been complied with, the bid shall not be considered for award nor shall any award be made unless the General Manager of the Fund, or his designee, determines that such disclosure was not made for purposes of restricting competition.

The fact that a bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of this Section.

7. The bidder agrees that if awarded the Contract, it will commence work upon receipt of the Notice to Proceed and that it will fully complete the work by the date stated or within the duration herein, as applicable.

8. The bidder acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein.

Addendum Number	Date	Addendum Number	Date
_____	____/____/____	_____	____/____/____
_____	____/____/____	_____	____/____/____
_____	____/____/____	_____	____/____/____

9. The Omnibus Procurement Act of 1992, as amended, requires that, by signing this Proposal, the bidder certifies that whenever its Total Bid amount is greater than \$1,000,000: (a) it has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors on this Project, and has retained the documentation of these efforts to be provided upon request to the State; (b) it has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended; (c) it agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this Project through listing any such positions with Community Services Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The bidder further agrees to document these efforts and to provide said documentation to the State and the Fund upon request, and agrees to cooperate with the State in these efforts. Documented efforts by a successful bidder shall consist of and be limited to showing that such bidder has:

- a. Solicited bids, in a timely and adequate manner, from New York State Business Enterprises including certified Minority and Women's owned Business Enterprises, or
- b. Contacted the New York State Department of Economic Development to obtain listings of New York State Business Enterprises, or
- c. Placed notices for subcontractors and suppliers in newspapers, journals and other trade publications distributed in New York State, or
- d. Participated in bidder outreach conferences.
- e. If the bidder determines that New York State Business Enterprises are not available to participate on the Contract as subcontractors or suppliers, the bidder shall provide a statement indicating the method by which such determination was made.
- f. If the bidder does not intend to use subcontractors on the Contract, the bidder shall provide a statement verifying such intent.

10. The bidder submits herewith bid security in an amount not less than five (5) percent of the Total Bid. In the event that

(a) the bidder's Total Bid is the lowest one submitted and the bidder does not timely provide the Post-Bid Information required under Section 8 of the Information for Bidders; or

(b) this Proposal is accepted by the Fund and the bidder shall refuse or neglect, within ten (10) working days after date of receipt of Notice of Award to:

- (1) execute and deliver an Agreement in the form provided herein; or
- (2) execute and deliver a Performance Bond and a Labor and Material Bond in the amounts required and in the form prescribed; or
- (3) provide proof of insurances required in Article V of the Agreement; or

- (4) provide the 120-day Schedule required by the General Requirements, Special Conditions paragraph 01 32 16, titled "Project Schedule;"

then the bidder shall be liable to the Fund, as liquidated damages, for the amount of the bid security or the difference between the Total Bid of the bidder and the Total Bid of the bidder submitting the next lowest bid, whichever sum shall be higher, otherwise the total amount of the bid security will be returned to the bidder in accordance with the provisions set forth in the Information for Bidders.

The Fund may apply the bid security in full or partial payments, as the case may be, of said liquidated damages and in the event the bid security is less than the amount of liquidated damages to which the Fund is entitled, the bidder shall pay the difference, upon demand, to the Fund.

11. The bidder certifies that all wood products that are to be used in the performance of this Contract shall be in accordance with the Specifications and provisions of Section 167 b. of the State Finance Law which Section prohibits the purchase and use of tropical hardwoods.
12. The bidder affirms that it understands and agrees to comply with the procedures of the Fund relative to permissible contacts as required by Sections 139-j(3) and 139-j-(6)(b) of the State Finance Law.
13. The bidder certifies that all information provided or to be provided to the Fund in connection with this procurement is, as required by Section 139-k of the State Finance Law, complete, true and accurate.

Dated _____
(Legal name of person, partnership, joint venture, corporation, or LLC)

(If corporation, affix corporate seal) By _____
(Signature)

Title _____

Firm's Federal ID Number or Social Security Number as applicable _____

Firm's NYS SFS Vendor Identification Number _____

Check: Is Firm NYS-Certified* MBE? ☐ Yes WBE? ☐ Yes

*(*Defined as independent business concerns which are at least 51% owned and controlled by minority group members or women (citizens of the United States or permanent resident aliens who are Black, Hispanic, Asian or American Indian), whose ownerships in the concerns are real, substantial and continuing and who have and exercise the authority to independently control the decisions of the concerns)*

ATTENTION BIDDERS: ALSO FULLY EXECUTE PAGES P-5, P-6, P-7, P-8, P-9, P-10, AND P-11.

THE POST OFFICE ADDRESS OF THE BIDDER

Telephone No. _____ Email Address _____

If a Corporation

Name	Address
_____, PRESIDENT	_____
_____, SECRETARY	_____
_____, TREASURER	_____

If a Partnership

Name of Partners	Address
_____	_____
_____	_____
_____	_____

If a Joint Venture

Name of Members	Address
_____	_____
_____	_____
_____	_____

If an Individual

Name of Individual	Address
_____	_____

If a Limited Liability Corporation

Name	Address
_____	_____
_____	_____
_____	_____

STATE UNIVERSITY CONSTRUCTION FUND
353 Broadway • Albany, New York 12246
Offerer Disclosure of Prior Non-Responsibility Determinations

Name of Individual or Entity Seeking to Enter into the Procurement Contract:

Address:

Name and Title of Person Submitting this Form:

SUCF Project Number: 081047-00

Date:

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? ☐ No ☐ Yes

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law Section 139-j: ☐ No ☐ Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? ☐ No ☐ Yes

4. If you answered "yes" to any of the above questions, please provide details regarding the finding of non-responsibility below.

Governmental Entity: _____

Date of Finding of Non-Responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above-named individual or entity due to the intentional provision of false or incomplete information? ☐ No ☐ Yes

6. If yes, please provide details below.

Governmental Entity: _____

Date of Termination or Withholding of Contract: _____

Basis of Termination or Withholding: _____

(Add additional pages as necessary)

Offerer certifies that all information provided to SUCF with respect to State Finance Law Section 139-k is complete, true and accurate. Submit form with original signature with Proposal.

By: _____
Signature

Date

STATE UNIVERSITY CONSTRUCTION FUND
353 Broadway • Albany, New York 12246
IRAN ENERGY SECTOR DIVESTMENT COMPLIANCE

Printed Name of Entity Seeking to Enter into the Contract:

Address:

Printed Name and Title of Person Executing Certification:

SUCF Project Number: _____081047-00_____

Pursuant to New York State Finance Law §165-a, Iran Divestment Act of 2012 (Act), the Office of General Services is required to post on its web site a list of persons who have been determined to engage in investment activities in Iran ("prohibited entities list"), as defined by the Act. New York State Public Authorities Law § 2879-c, with certain exceptions, prohibits the Fund from entering into or awarding a Contract with persons identified on the prohibited entities list.

CERTIFICATION:

By submission of this bid or proposal, each person (as defined in paragraph (e) of subdivision one of section one hundred sixty five-a of the state finance law) and each person signing on behalf of any other party certifies, and in the case of a joint bid or proposal or partnership each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each person is not on the list created pursuant to paragraph (b) of subdivision 3 of section 165-a of the State finance law.

STATE OF)
)ss.:
COUNTY OF)

The undersigned, being duly sworn, says (a) I am duly authorized to execute this Certification and (b) I hereby certify, under penalty of perjury, that the forgoing Certification is in all respects true and accurate.

Signature of Person Executing
Certification: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public

Submit form with original signatures

Certification Regarding Sexual Harassment Prevention Policies Pursuant to State Finance Law §139-I

Dec 2018

ENCOURAGING USE OF NEW YORK STATE BUSINESSES IN CONTRACT PERFORMANCE

New York State businesses have a substantial presence in State contracts and strongly contribute to the economies of the state and the nation. In recognition of their economic activity and leadership in doing business in New York State, bidders/proposers for this contract for commodities, services or technology are strongly encouraged and expected to consider New York State businesses in the fulfillment of the requirements of the contract. Such partnering may be as subcontractors, suppliers, protégés or other supporting roles.

Bidders/proposers need to be aware that all authorized users of this contract will be strongly encouraged, to the maximum extent practical and consistent with legal requirements, to use responsible and responsive New York State businesses in purchasing commodities that are of equal quality and functionality and in utilizing services and technology. Furthermore, bidders/proposers are reminded that they must continue to utilize small, minority and women-owned businesses, consistent with current State law.

Utilizing New York State businesses in State contracts will help create more private sector jobs, rebuild New York's infrastructure, and maximize economic activity to the mutual benefit of the contractor and its New York State business partners. New York State businesses will promote the contractor's optimal performance under the contract, thereby fully benefiting the public sector programs that are supported by associated procurements.

Public procurements can drive and improve the State's economic engine through promotion of the use of New York businesses by its contractors. The State therefore expects bidders/proposers to provide maximum assistance to New York businesses in their use of the contract. The potential participation by all kinds of New York businesses will deliver great value to the State and its taxpayers.

Bidders/proposers can demonstrate their commitment to the use of New York State businesses by responding to the question below:

Will New York State Businesses be used in the performance of this contract? ☐ Yes ☐ No

SUCF Project Number: _____081047-00_____

If yes, identify New York State Business(es) that will be used; (list identifying information below).

(Attach additional identifying information with the bid as required)

By: _____ Date: _____
Signature

Print Name and Title: _____

Contractor Name: _____

Contractor Address: _____

EO 177 Certification

The New York State Human Rights Law, Article 15 of the Executive Law, prohibits discrimination and harassment based on age, race, creed, color, national origin, sex, pregnancy or pregnancy-related conditions, sexual orientation, gender identity, disability, marital status, familial status, domestic violence victim status, prior arrest or conviction record, military status or predisposing genetic characteristics.

The Human Rights Law may also require reasonable accommodation for persons with disabilities and pregnancy-related conditions. A reasonable accommodation is an adjustment to a job or work environment that enables a person with a disability to perform the essential functions of a job in a reasonable manner. The Human Rights Law may also require reasonable accommodation in employment on the basis of Sabbath observance or religious practices.

Generally, the Human Rights Law applies to:

- all employers of four or more people, employment agencies, labor organizations and apprenticeship training programs in all instances of discrimination or harassment;
- employers with fewer than four employees in all cases involving sexual harassment; and,
- any employer of domestic workers in cases involving sexual harassment or harassment based on gender, race, religion or national origin.

In accordance with Executive Order No. 177, the Bidder hereby certifies that it does not have institutional policies or practices that fail to address the harassment and discrimination of individuals on the basis of their age, race, creed, color, national origin, sex, sexual orientation, gender identity, disability, marital status, military status, or other protected status under the Human Rights Law.

Executive Order No. 177 and this certification do not affect institutional policies or practices that are protected by existing law, including but not limited to the First Amendment of the United States Constitution, Article 1, Section 3 of the New York State Constitution, and Section 296(11) of the New York State Human Rights Law.

Contractor Name: _____

By: _____ Date: _____
Signature

Print Name and Title: _____

State University Construction Fund

Bid proposal supplement

Attachment A – List of Completed Similar Construction Projects

Bidder Name:

SUCF Project No.: 81047

Bidders must provide three (3) example projects completed in the past five (5) years in which the Bidder served as the prime contractor. Example projects must be of similar size, scope and complexity to the project currently being bid, as further described in the General Requirements, Section 01 11 00, Description of Work. Each project must include the Owner/Agency, Award Date, Contract Amount, Date Completed, Contact Person, Telephone number of the contact, Architect and/or Engineer's Name, Contract Number, Contact Email, and the Project Title and a brief scope description. Reference contacts may be used to verify project size, scope, dollar value, percentages and quality of performance.

1.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
2.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
3.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
Completed By:				Phone Number: Email: Date:		

00 43 13 10 INSTRUCTIONS FOR EXECUTION OF BID BOND

NOTE: All instructions are numbered in the sequence that they appear on the following Bid Bond sample:

1. Name of Principal.
- 1a. Address of Principal.
2. Surety name, address (*Note: Must be authorized to do business in NYS as surety*).
3. Surety's State of incorporation.
4. Surety's principal office.
5. Amount of bid security (*in words and figures OR "5% of amount of bid"*).
6. Correct project designation, including SUCF Project No.
7. "Attorney-in-Fact" (*or other authorized representative*) of Surety.
8. Execution date of Bond.
9. Name of Principal.
10. Original signature of Principal's officer (if corporation); partner (if partnership); or individual owner (facsimile or stamped signature not acceptable). *Note: If Principal's signatory is not a corporate officer, such other authorized representative's capacity to execute the Bond on behalf of Principal must be shown by a duly executed document reflecting the grant of such authority, e.g. by a copy of the appropriate Resolution of the Board of Directors of Principal).*
11. Corporate seal of Principal (if a corporation).
12. Name of Surety.
13. Original signature of Surety's Attorney-in-Fact (or other authorized representative). *Note: Facsimile or stamped signature not acceptable.*
14. Corporate seal of Surety. *Note: If the Bond is executed by joint venture, each member of the joint venture must affix its appropriate name, signature, seal, etc., as listed above. Changes, additions, or deletions in the text of the Fund's Bond form are not acceptable.*

The Bond must also have attached to it: (1) Surety Company's Power of Attorney (naming attorney executing Bond); (2) Surety's Certificate (date to be on or after date of Bond execution); (3) Surety's current Financial Statement (no more than two years old).

Note: On the Surety's Financial Statement, "surplus to policy holders" must be in an amount at least ten (10) times the amount of the bid security (Item "5" on Page BB-1).

BID BOND

BOND NO. _____

KNOW ALL PERSONS BY THESE PRESENTS, that

-1-

, having an office at

-1a-

(hereinafter called the "Principal") and the

-2-

a corporation created and existing under the laws of the State of **-3-**, having its principal office at

-4-

(hereinafter called the "Surety") are held and firmly bound unto the State University Construction Fund (hereinafter called the "Fund") in the full and just sum of

-5-

dollars (\$)

good and lawful money of the United States of America, or in the full and just sum of the difference between the Total Bid of the Principal and the Total Bid of the bidder submitting the next lowest bid, whichever sum shall be higher, for the payment of which said sum of money, well and truly to be made and done, the Principal binds itself, its heirs, executors, administrators, successors and assigns and the Surety binds itself, its successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted to the Fund a Proposal for

-6-

which Proposal is incorporated herein by reference and made a part hereof as fully and to the same extent as if set forth at length herein;

NOW, THEREFORE, the condition of this obligation is such that in the event (1) the Principal's Total Bid is the lowest one submitted and the Principal timely provides the Post-Bid Information required under Sections 7 and 8 of the Information for Bidders or (2) the Fund shall accept the Proposal of the Principal and the Principal shall enter into a Contract with the Fund in accordance with the terms of such Proposal and/or enter into certain prescribed subcontracts in accordance with the terms of such Proposal and give such Bond or Bonds, proof of insurances, and 120-day Schedule as may be specified in the Bidding or Contract Documents, then

this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligation of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the Fund may accept the Proposal of the Principal and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal has hereunto set its hand and seal and the Surety has caused this instrument to be signed by its **-7-**

and its corporate seal to be hereunto affixed this day of **-8-** 20 .

-9-

Principal

-10-

By

(If Corporation, affix corporate seal)

-11-

-12-

Surety

-13-

By

(If Corporation, affix corporate seal)

-14-

INSTRUCTIONS FOR EXECUTION OF ACKNOWLEDGMENTS

NOTE: All instructions are numbered in the sequence that they appear on the following Acknowledgment sample:

Acknowledgment by Individual Principal:

1. State where executed.
2. County where executed.
3. Date of execution.
4. Month of execution.
5. Year of execution.
6. Name of Individual Principal.
7. Original signature of Notary before whom Acknowledgment is signed. *NOTE: Facsimile or stamped signature not acceptable.*
8. Attach stamp or seal of Notary, showing (current) date of expiration of commission.

Acknowledgment by Corporate Principal:

1. State where executed.
2. County where executed.
3. Date of execution.
4. Month of execution.
5. Year of execution.
6. Name of Principal's Corporate Officer (or authorized representative).
7. Residence of Principal's Corporate Officer (or authorized representative).
8. Title of Corporate Officer (or authorized representative).
9. Full name of Principal.
10. Original signature of Notary before whom Acknowledgment is signed. *NOTE: Facsimile or stamped signature not acceptable.*
11. Attach stamp or seal of Notary, showing (current) date of expiration of commission.

Acknowledgment By Surety:

1. State where executed.
2. County where executed.
3. Date of execution.
4. Month of execution.
5. Year of execution.
6. Name of Surety's Attorney-in-Fact (or authorized representative).
7. Residence of Surety's Attorney-in-Fact (or authorized representative).
8. "Attorney-in-Fact" (or other authorized representative) of Surety.
9. Full name of Surety.
10. Original signature of Notary before whom Acknowledgment is signed. *NOTE: Facsimile or stamped signature not acceptable.*
11. Attach stamp or seal of Notary showing (current) date of expiration of commission.

NOTE: The date of all Acknowledgments must be on or after the date of execution of the Bond (Item "8" on page BB-1).

ACKNOWLEDGMENTS

(ACKNOWLEDGMENT BY PRINCIPAL, UNLESS IT BE A CORPORATION)

STATE OF -1-)
) ss.:
COUNTY OF -2-)

On this -3- day of -4-, 20 -5-, before me personally came -6-,
to me known and known to me to be the person(s) described in and who executed the foregoing instrument and
acknowledged that he executed the same.

-7-
Notary Public

-8-

(ACKNOWLEDGMENT BY PRINCIPAL, IF A CORPORATION)

STATE OF -1-)
) ss.:
COUNTY OF -2-)

On this -3- day of -4-, 20 -5-, before me personally came -6-,
to me known who, being by me duly sworn, did depose and say that he resides in -7-;

that he is the -8- of the -9-,
the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that the seal affixed to said instrument is such corporate seal; that is was so affixed by order of the Board
of Directors of said corporation and that he signed h name thereto by like order.

-10-
Notary Public

-11-

(ACKNOWLEDGMENT BY SURETY COMPANY)

STATE OF -1-)
) ss.:
COUNTY OF -2-)

On this -3- day of -4-, 20 -5-, before me personally came -6-,
to me known who, being by me duly sworn, did depose and say that he resides in -7-;

that he is the -8- of the -9-,
the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that the seal affixed to said instrument is such corporate seal; that is was so affixed by order of the Board
of Directors of said corporation and that he signed h name thereto by like order; and that the liabilities of
said company do not exceed its assets as ascertained in the manner provided by the laws of the State of New York.

-10-
Notary Public

BID BOND

BOND NO. _____

KNOW ALL PERSONS BY THESE PRESENTS, that

, having an office at

(hereinafter called the "Principal") and the

a corporation created and existing under the laws of
the State of _____,
having its principal office at

(hereinafter called the "Surety") are held and firmly
bound unto the State University Construction Fund
(hereinafter called the "Fund") in the full and just sum
of

_____ dollars (\$ _____)
good and lawful money of the United States of
America, or in the full and just sum of the difference
between the Total Bid of the Principal and the Total Bid
of the bidder submitting the next lowest bid, whichever
sum shall be higher, for the payment of which said sum
of money, well and truly to be made and done, the
Principal binds itself, its heirs, executors,
administrators, successors and assigns and the Surety
binds itself, its successors and assigns, jointly and
severally, firmly by these presents.

WHEREAS, the Principal has submitted to the Fund a
Proposal for

which Proposal is incorporated herein by reference and
made a part hereof as fully and to the same extent as
if set forth at length herein;

NOW, THEREFORE, the condition of this obligation is
such that in the event (1) the Principal's Total Bid is the
lowest one submitted and the Principal timely provides
the Post-Bid Information required under Sections 7 and
8 of the Information for Bidders or (2) the Fund shall
accept the Proposal of the Principal and the Principal
shall enter into a Contract with the Fund in accordance
with the terms of such Proposal and/or enter into
certain prescribed subcontracts in accordance with the
terms of such Proposal and give such Bond or Bonds,
proof of insurances, and 120-day Schedule as may be
specified in the Bidding or Contract Documents, then

this obligation shall be null and void, otherwise to
remain in full force and effect.

The Surety, for value received, hereby stipulates and
agrees that the obligation of said Surety and its Bond
shall be in no way impaired or affected by any
extension of the time within which the Fund may accept
the Proposal of the Principal and said Surety does
hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal has hereunto
set its hand and seal and the Surety has caused this
instrument to be signed by its

and its corporate seal to be hereunto affixed this
day of _____ 20____.

Principal

By

(If Corporation, affix corporate seal)

Surety

By

(If Corporation, affix corporate seal)

ACKNOWLEDGMENTS

(ACKNOWLEDGMENT BY PRINCIPAL, UNLESS IT BE A CORPORATION)

STATE OF)
) ss.:
COUNTY OF)

On this _____ day of _____, 20____, before me personally came

_____, to me known and known to me to be the person(s) described in and who executed the foregoing instrument and acknowledged that he executed the same.

Notary Public

(ACKNOWLEDGEMENT BY CORPORATION)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came

_____, to me known, who, being by me duly sworn, did depose and say that he/she/they reside(s) in _____; that he/she/they is (are) the _____ (president or other officer or director or attorney in fact duly appointed) of the _____ (name of corporation), the corporation described in and which executed the above instrument; and that he/she/they signed his/her/their name(s) thereto by authority of the board of directors of said corporation.

Notary Public

;

(ACKNOWLEDGMENT BY SURETY COMPANY)

STATE OF)
) ss.:
COUNTY OF)

On this _____ day of _____, 20____, before me personally came

_____, to me known who, being by me

duly sworn, did depose and say that he resides in _____;

that he is the _____ of the

_____, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation and that he signed his name thereto by like order; and that the liabilities of said company do not exceed its assets as ascertained in the manner provided by the laws of the State of New York.

Notary Public

State University Construction Fund AGREEMENT

This Agreement made as of the day of X, 2020, by and between the State University Construction Fund, whose address is The State University Plaza, 353 Broadway, Albany, New York 12246, hereinafter referred to as the "Fund", and

hereinafter referred to as the "Contractor".

WITNESSETH:

The parties hereto agree that the Contractor shall (a) furnish and perform all work of every kind required and all other things necessary to complete in the most substantial and workmanlike manner the construction of

in strict accordance with the Contract Documents;

(b) complete all work necessary for substantial completion by .

or within days, starting after receipt of the Notice to Proceed,

[INSTRUCTIONS: Identify substantial completion date above utilizing only one method.]

or within the time to which such completion may have been extended in accordance with the Contract Documents; (c) in the event it fails to substantially complete all the work on time, pay to the Fund liquidated damages in the amount of

for each calendar day of delay of substantially completing all the work; and (d) do everything required by the Contract; subject, however, to the terms, provisions and conditions listed hereinafter.

Article I General Provisions

Section 1.01 Definitions

Where the following words and expressions are used in the Contract Documents it is understood that they have the meaning set forth as follows:

Allowance Any and all work and materials which may be required of the Contractor in performing work set forth under one or more allowances to this Contract shall be Work, as defined herein, which shall be performed in accordance with the base schedule for the performance of the Contractor's Work. Contractor shall not be entitled to an extension of time for the performance of an allowance or all allowances.

Consultant The Architect or Engineer named in the Notice to Bidders or such other person or firm designated by the Fund to provide general administration of the Contract and inspection of the work.

Bidding Documents Notice to Bidders, Information for Bidders and Proposals

Bonds Performance Bond and Labor and Material Bond

Delay For purposes of this document and as used herein and in any other contract documents between the Contractor and the Fund the word "delay" shall be interpreted broadly and shall include by way of example only and not by way of limitation: delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Fund and/or Consultant, and lack of coordination, cumulative impact of multiple change orders, delay and other impacts.

Contract or Contract The Agreement, Bonds, Specifications, Project Manual, Drawings, Addenda

Documents	issued prior to the opening of bids and Change Orders issued after award of the Contract.
Fund or Owner	State University Construction Fund
Notice of Award	Letter of Intent
Project	The facility or facilities to be constructed including all usual, appropriate and necessary attendant work shown on, described in or mentioned in the Contract.
Site	The area within the Contract limit lines, as shown on the Drawings, and all other areas upon which the Contractor is to perform work.
Substantial Completion	Substantial Completion is the completion of Work so that the Project can be fully occupied and used for the purposes for which it is intended. Substantial Completion includes: (1) completion of all work required for the issuance of a code compliance certificate, or a temporary approval for occupancy, completed in a manner that includes no uncorrected deficiency or material violation of the Building Code of New York State within the area or work for which the certificate is to be issued; (2) completion of all building systems and functional testing of said systems (other than tests that cannot be performed due to the seasonal environmental conditions in effect at the time of completion); (3) acceptance and approval of the Operating Instructions and Manuals and Training of Campus Personnel; and (4) the sum of values determined for Punch List work at the time of Substantial Completion shall not exceed one (1) percent of the amount of the Contract consideration unless otherwise agreed to by the Fund.
Work	The using, performing, installing, furnishing and supplying of all materials, equipment, labor, services and incidentals necessary or proper for or incidental to the successful completion of the Project and the carrying out of all

duties and obligations imposed upon the Contractor by the Contract.

Section 1.02 Captions

The titles or captions of Articles and Sections of the Contract are intended for convenience and reference purposes only and in no way define, limit or describe the scope or intent thereof or of the Contract or in any way affect the Contract.

Section 1.03 Nomenclature

Materials, equipment or other work described in words and abbreviations which have a well-known, technical or trade meaning shall be interpreted as having such meaning in connection with the Contract.

Section 1.04 Entire Agreement

The Contract constitutes the entire agreement between the parties hereto and no statement, promise, condition, understanding, inducement or representation, oral or written, expressed or implied, which is not contained herein shall be binding or valid and the Contract shall not be changed, modified, or altered in any manner except by an instrument in writing executed by the parties hereto.

Section 1.05 Successors and Assigns

The Contract shall bind the successors, assigns and representatives of the parties hereto.

Section 1.06 Accuracy and Completeness of Contract Documents

(1) The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all materials, plant, equipment, tools, skill and labor of every kind necessary for the proper execution of the work and also those things which may be reasonably inferable from the Contract Documents as being necessary to produce the intended results.

(2) The Contract Documents contemplate a finished piece of work of such character and quality as is reasonably inferable from them. The Contractor acknowledges that the Contract consideration includes sufficient money allowance to make its work complete and operational and in compliance with good practice and it agrees that inadvertent minor discrepancies or omissions or the failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another shall

not be the cause for additional charges or claims. In case of a conflict between any part or parts of the Contract Documents with any other part or parts thereof, as contrasted to an omission or failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another part thereof, the following shall be given preference, in the order hereinafter set forth, to determine what work the Contractor is required to perform: (a) Addenda (later dates to take preference over earlier dates); (b) Amendments to Agreement; (c) Agreement; (d) Specifications; (e) Schedules; (f) Large scale detail Drawings (detail drawings having a scale of 3/4" and over); (g) Large scale plan and section Drawings (plan and section drawings having a scale equal to or larger than that used for the basic floor or site plan, as the case may be); (h) Small scale detail Drawings (detail drawings having a scale of less than 3/4"); and (i) Small scale plan and section Drawings (plan and section drawings having a scale less than that used for the basic floor or site plan, as the case may be). In the event of such a conflict between or among parts of the Contract Documents that are entitled to equal preference, the more expensive way of doing the work, the better quality or greater quantity of material shall govern unless the Fund otherwise directs.

Section 1.07 Organization of Contract Documents

The Specifications and Drawings are generally divided into trade sections for the purpose of ready references, but such division is arbitrary and such sections shall not be construed as the prescription by the Consultant or the Fund of the limits of the work of any subcontractor or as a determination of the class of labor or trade necessary for the fabrication, erection, installation or finishing of the work required. The Contractor will be permitted to allot the work of subcontractors at its own discretion regardless of the grouping of the Specifications and Drawings. It shall be the Contractor's responsibility to settle definitively with each subcontractor the portions of the work which the latter will be required to do. The Fund and the Consultant assume no responsibility whatever for any jurisdiction claimed by any of the trades involved in the work.

Section 1.08 Furnishing of Contract Documents

The Fund shall establish the format for the Contract Documents (hard copy and/or electronic media) at the start of the Project. The Contractor shall be furnished, free of charge, with two (2) copies of the Specifications and Drawings in the selected format(s). Any other copies of the Specifications and Drawings which the

Contractor may desire can be obtained at the Contractor's expense.

Section 1.09 Examination of Contract Documents and Site

By executing the Contract, the Contractor agrees that it has carefully examined the Contract Documents together with the site of the proposed work as well as its surrounding territory; that it is fully informed regarding all the conditions affecting the work to be done and the labor and materials to be furnished for the completion of the Contract; and that its information has been acquired by personal investigation and research and not in the estimates and records of the Fund.

Section 1.10 Invalid Provisions

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

Section 1.11 No Collusion or Fraud

The Contractor hereby agrees that the Contract was secured without collusion or fraud and that neither any officer nor any employee of the Fund has or shall have a financial interest in the performance of the Contract or in the supplies, work or business to which it relates, or in any portion of the profits thereof.

Section 1.12 Notices

(1) All notices permitted or required hereunder shall be in writing and shall be transmitted either:

- a. via certified or registered United States mail, return receipt requested;
- b. by personal delivery;
- c. by expedited delivery service; or
- d. by email if actually received by the Fund.
Contractor bears the burden of service by email and receipt of email by the Fund.

Such notices shall be addressed as follows or to such different addresses as the parties may from time to time designate:

The State University Construction Fund

Name:

Title:

Address: 353 Broadway, Albany, NY 12246

Telephone Number:

E-mail address:

Contractor

Company Name:

Designated Contact Name:

Contact Title:

Address:

Telephone Number:

E-mail Address:

(2) Any such notice shall be deemed to have been given either at the time of personal delivery or actual receipt by the Fund, or in the case of email, upon receipt by the Fund.

(3) The parties may, from time to time, specify any new or different address in the United States as their address for purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.

Section 1.13 Singular-Plural; Male-Female

As used in the Contract Documents, the singular of any word or designation, whenever necessary or appropriate, shall include the plural and vice versa, and the masculine gender shall include the female and neutral genders and vice versa.

Article II

Contract Administration and Conduct

Section 2.01 Consultant's Status

(1) The Consultant, as the Fund's representative, shall provide general administration of the Contract and inspection of the work. The Consultant will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and it will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents. The Consultant's duties, services and work shall in no way supersede or dilute the

Contractor's obligation to perform the work in conformance with all Contract requirements, but it is empowered by the Fund to act on its behalf with respect to the proper execution of the work and to give instructions and/or direction when necessary to require such corrective measures as may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the Fund's interest.

(2) The Consultant shall have the authority to stop the work or to require and/or direct the prompt execution thereof whenever such action may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the interests of the Fund.

(3) Except as otherwise provided in the Contract, the Consultant shall determine the amount, quality, acceptability, fitness and progress of the work covered by the Contract and shall decide all questions of fact which may arise in relation to the interpretation of the plans and Specifications, the performance of the work and the fulfillment by the Contractor of the provisions of the Contract. The Consultant shall in the first instance be the interpreter of the provisions of the Contract and the judge of its performance and it shall use its power under the Contract to enforce its faithful performance.

Section 2.02 Finality of Decisions

(1) Any decision or determination of the Consultant under the provisions of the Contract shall be final, conclusive and binding on the Contractor unless the Contractor shall, within ten (10) working days after such decision, make and deliver to the Fund a verified written statement of its contention that the decision of the Consultant is contrary to a provision of the Contract. The Fund shall thereupon determine the validity of the Contractor's contention. Pending decision by the Fund, the Contractor shall proceed in accordance with the Consultant's decision.

(2) Wherever it is provided in the Contract Documents that an application must be made to the Fund and/or determination made by the Fund, the Fund's decision on such application and/or its determination under the Contract Documents shall be final, conclusive and binding upon the Contractor unless the Contractor, within ten (10) working days after receiving notice of the Fund's decision or determination, files a written statement with the Fund and the Consultant that it reserves its rights in connection with the matters covered by said decision or determination and after a court of competent

jurisdiction determines the Fund's said decision or determination to be fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith, in an action brought in accordance with Section 4.24.

Section 2.03 Claims and Disputes

(1) If the Contractor claims (i) that any work it has been ordered to do is extra work or (ii) that it has performed or is going to perform extra work or (iii) that any action or omission of the Fund or the Consultant is contrary to the terms and provisions of the Contract, it shall:

- a. Promptly comply with such order;
- b. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the Fund and the Consultant, within five (5) working days after being ordered to perform the work claimed by it to be extra work or within five (5) working days after commencing performance of the extra work, whichever date shall be the earlier, or within five (5) working days after the said action or omission on the part of the Fund or the Consultant occurred, a written notice of the basis of its claim and request a determination thereof,
- c. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the Fund and the Consultant, within thirty (30) calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be the earlier, or said alleged action or omission by the Fund or the Consultant occurred, a verified detailed statement, with documentary evidence, of the items and basis of its claim, including an initial and updated detailed Time Progress Schedule,
- d. Produce for the Fund's examination, upon notice from the Fund, such information and documentation as directed by the Fund, which shall include but not be limited to job cost reports and all estimates and documentation used to develop the Bid Proposal, all its books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks and cancelled checks, showing all of its actions and transactions in connection with or relating to or arising by reason of its claim, and submit persons in its employment and in its subcontractors' employment for examination under oath by any

person designated by the Fund to investigate any claims made against the Fund under the Contract, such examination to be made at the offices of the Contractor; and

- e. Proceed diligently, pending and subsequent to the determination of the Fund with respect to any such disputed matter, with the performance of the Contract and in accordance with all instructions of the Fund and the Consultant.

(2) The Contractor's failure to comply with any or all parts of subdivision b, c and d of paragraph (1) of this Section shall be deemed to be: (i) a conclusive and binding determination on its part that said order, work, action or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and (ii) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission. The provisions of subdivision b, c and d of paragraph (1) of this Section are for the purpose of enabling the Fund to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects or circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expenses or circumstances as they occur. Compliance with such provisions is essential whether or not the Fund is aware of the circumstances of any order or other circumstances which might constitute a basis for a claim and whether or not the Fund has indicated it will consider a claim in connection therewith.

(3) The Contractor's failure to submit and maintain a Time Progress Schedule in accordance with Section 3.02 of the Agreement shall be deemed to be a waiver by the Contractor of all claims for additional time, compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work. The Schedule of Record, regularly updated and submitted at required durations in accordance with the provisions of the General Requirements, Section paragraph titled "Project Schedule": (i) informs the Fund and affords it promptly of regular opportunities to change its plans or mitigate or remedy the effects or circumstances giving rise to a claim of delay in the completion of the work or take such other action as may seem desirable to verify any claimed circumstances as they occur; and (ii) forms a record which becomes the basis of the Fund's verification of an alleged cause of delay in the completion of the work.

(4) No person has power to waive or modify any of the foregoing provisions and, in any action against the Fund to recover any sum in excess of the sum certified by the Fund to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with the provisions of this Section.

(5) Nothing in this Section shall in any way affect the Fund's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by or against the Fund or the Contractor.

Section 2.04 Omitted Work

The Fund reserves the right at any time during the progress of the work to delete, modify or change the work covered by the Contract, by a Change Order or Field Order thereto providing for either a reduction or omission of any portion of the work, without constituting grounds for any claim by the Contractor for allowances for damages or for loss of anticipated profits and in such event a deduction shall be made from the Contract consideration, the amount of which is to be determined in accordance with the provisions of Section 4.02 or 4.05A of the Agreement.

Section 2.05 Extra Work

(1) The Fund reserves the right at any time during the progress of the work to add, modify or change the work covered by the Contract by Change Order or Field Order or as otherwise required by the Fund thereto providing for extra work of either a qualitative or quantitative nature and in such event the Contract consideration may be increased by an amount to be determined in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement and the completion date for all or any part of the work may be extended for such period of time as may be determined by the Fund as necessary, because of the extra work, to complete the work or any part thereof.

(2) Nothing in the Contract Documents shall excuse the Contractor from proceeding with the extra work as directed. The terms and conditions of the Contract Documents shall be fully applicable to all extra work.

(3) The Contractor shall have no claim for extra work or an extension of time if the performance of such work, in the judgment of the Consultant, is made necessary or desirable because of any act or omission of the Contractor which is not in accordance with the Contract.

(4) Notwithstanding the provisions of Section 2.02 of the Agreement and any other provisions of the Contract Documents to the contrary, an officer of the Fund, after conferring with the Consultant, shall have the right to overrule a determination or decision of the Consultant, that relates to whether certain work is included in the Contract Documents or is extra work, which he or she believes is incorrect; in the event an officer exercises such right, his or her determination or decision shall be final, conclusive and binding upon the Contractor and the Fund unless the same shall be determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith.

Section 2.06 Contractor to Give Personal Attention

(1) The Contractor shall give its constant personal attention to all the work while it is in progress and shall place the work in charge of a competent and reliable full-time superintendent acceptable to the Consultant and the Fund who shall have authority to act for the Contractor and who shall be accountable to the Consultant to the extent provided in the Contract. Unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ, such superintendent shall not be changed without the written permission of the Consultant and the Fund.

(2) When the Contractor and its superintendent are temporarily absent from the site of the work, the Contractor or its superintendent shall designate a responsible supervisory employee, approved by the Consultant and the Fund, to receive such orders as the Consultant or its representative may give. At no time shall any work be conducted on the site in the absence of an individual present who has been so designated by the Contractor or its superintendent as having authority to receive and execute instructions given by the Consultant or its representative.

(3) If the superintendent, project manager or other supervisory employees are not satisfactory to the Fund, the Contractor shall, if directed by the Fund, immediately replace such supervisory employees with other supervisory employees acceptable to the Consultant and the Fund. Such replacement and all related impacts shall be at no additional cost to the Fund.

Section 2.07 Employment of Workers

The Contractor shall at all times employ competent and suitable workers and equipment which shall be sufficient to prosecute all the work to full completion in

a disciplined orderly manner and in accordance with the Time Progress Schedule and the contractually required time of performance. All workers engaged in special or skilled work shall have had sufficient experience in such work to properly and satisfactorily perform the same. Should the Consultant deem any employee of the Contractor or any subcontractor incompetent, careless, insubordinate or otherwise objectionable or whose continued employment on the work is deemed by the Consultant to be contrary to the public interest, it shall so advise the Contractor and the latter shall dismiss or shall cause the subcontractor, if such employee is employed by the latter, to dismiss such employee and such employee shall not again be employed on the work to be performed under the Contract without obtaining the prior written approval of the Consultant.

Section 2.08 Detailed Drawings and Instructions

Upon timely notice from the Contractor that supplementary information is required, the Consultant shall furnish additional instructions, by means of Drawings or otherwise, necessary for the proper execution of the work. All such Drawings and instructions shall be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. The work shall be executed in conformity therewith and the Contractor shall do no work without proper Drawings and/or instructions.

Section 2.09 Contract Documents to Be Kept at Site

The Contractor shall keep at the site of the work a copy of the Drawings and Specifications and shall at all times give the Consultant and the Fund access thereto.

Section 2.10 Permits and Building Codes

The Contractor shall obtain from the proper authorities all permits legally required to carry on its work, pay any and all taxes and fees legally required and shall be responsible for conducting its operations in accordance with the provisions of such permits. Except as otherwise expressly provided in the Contract Documents, all of the work covered by this Contract which is to be performed on property owned by the State University of New York is not subject to the building code of any city, county or other political subdivision of the State of New York. It is, however, subject to the provisions of the Building Code of New

York State and the applicable Federal and State health and labor laws and regulations.

Section 2.11 Surveys

(1) From the data shown on the Drawings and identified at the site by the Consultant, a licensed surveyor, to be designated and paid for by the Fund, shall establish one (1) fixed benchmark and one (1) fixed base line at the site. The Contractor shall work from the benchmarks and base lines shown on the Drawings, identified at the site by the Consultant and established at the site by the aforesaid surveyor and shall establish such supplementary bench marks and base lines that are required in order for it to lay out the work. The Contractor shall be responsible for all measurements that may be required for execution of the work to the exact position and elevation as prescribed in the Specifications, shown on the Drawings, or as the same may be modified at the direction of the Consultant to meet changed conditions or as a result of modifications to the work covered by the Contract.

(2) The Contractor shall furnish at its own expense such stakes and other required equipment, tools and materials, and all labor as may be required in laying out any part of the work. If, for any reason, monuments are disturbed, it shall be the responsibility of the Contractor to reestablish them, without cost to the Fund, as directed by the Consultant. The Consultant may require that construction work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking completed work or the work in progress.

(3) In all multiple-story construction, the Contractor shall establish and maintain line marks at each floor level and grade marks four (4) feet above the finished floor at each floor level.

Section 2.12 Site Conditions

(1) The Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provision as it deems proper for all physical conditions and subsurface conditions as it could reasonably anticipate encountering from the provisions of the Contract Documents, borings, rock cores, topographical maps and such other information as the Fund or the Consultant made available to it prior to the Fund's receipt of bids or from its own inspection and examination of the site prior to the Fund's receipt of bids.

(2) In the event that the Contractor encounters subsurface physical conditions or other latent physical conditions at the site differing substantially from those shown on or described or indicated in the Contract Documents and which could not have been reasonably anticipated from the aforesaid information made available by the Fund or the Consultant or from the Contractor's aforesaid inspection and examination of the site, it shall give immediate notice to the Consultant of such conditions before they are disturbed. The Consultant will thereupon promptly investigate the conditions and, if it finds that they do substantially differ from that which should have been reasonably anticipated by the Contractor, it shall make such changes in the Drawings and Specifications as may be necessary and a Change Order or Field Order may be issued, the amount of which shall be determined in accordance with the provisions of Sections 4.02 and 4.05A, to reflect any increase or decrease in the cost of, or the time required for, performance of the Contract as a result of any of the aforesaid changes made by the Consultant and/or as a result of such unanticipated subsurface conditions.

Section 2.13 Right to Change Location

When additional information regarding the subsurface conditions becomes available to the Fund as a result of the excavation work, further testing or otherwise, it may be found desirable to change the location, alignment, dimensions or grades to conform to such conditions. The Fund reserves the right to make such reasonable changes in the work as, in its opinion, may be considered necessary or desirable; such changes and any adjustments in the Contract consideration as a result thereof are to be made in accordance with the provisions of Sections 2.04, 2.05 4.02 and 4.05A of the Agreement.

Section 2.14 Unforeseen Difficulties

Except as otherwise expressly provided in Section 2.12 of the Agreement and in other Sections of the Contract Documents, the Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provisions as it deems proper for any unforeseeable obstacles or difficulties which it may encounter in the performance of the work.

Section 2.15 Moving Materials and Equipment

Should it become necessary, in the judgment of the Consultant, at any time during the course of the work to move materials which are stored on the site and equipment which has been temporarily placed thereon, the Contractor upon request of the Consultant

shall move them or cause them to be moved at its sole cost and expense; provided, however, if materials and equipment that have been stored or placed by the Contractor at a location on the site expressly approved, in writing, by the Consultant and the same are moved or caused to be moved by the Contractor at the Consultant's request, such removal shall be deemed extra work and the Contractor shall be compensated therefor in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement.

Section 2.16 Other Contracts

(1) Prior to and during the progress of the work hereunder the Fund reserves the right to let or permit the letting of other contracts relating to the Project or in connection with work on sites within the Contract limit lines or adjoining or adjacent to that on which the work covered by this Contract is to be performed. In the event such other contracts are let, or have previously been let, the Contractor and such other contractors shall coordinate their work with each other, arrange the sequence of their work to conform with the progressive operation of all the work covered by such contracts and afford each other reasonable opportunities for the introduction and storage of their materials, supplies and equipment and the execution of their work. If the Contractor or such other contractors contend that their work or the progress thereof is being interfered with by the acts or omissions of the other or others or that there is a failure to coordinate or properly arrange the sequence of the work on the part of the Contractor or such other contractors, they shall, within five (5) working days of the commencement of such interference or failure of coordination or failure to perform work in proper sequence, give written notification to the Fund and the Consultant of such contention. Upon receipt of such notification or on its own initiative, the Consultant shall investigate the situation and issue such instructions to the Contractor or such other contractors with respect thereto as it may deem proper. The Consultant shall determine the rights of the Contractor and of such other contractors and the sequence of work necessary to expedite the completion of all work covered by this Contract in relation to the work covered by said other contracts.

(2) The Contractor agrees that it has and will make no claim for damages against the Fund by reason of any act or omission to act by any other contractor or in connection with the Consultant's or Fund's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to recover such damages from the other contractors.

(3) Not Used.

(4) If the proper and accurate performance of the work covered by the Contract depends upon the proper performance and execution of work not included herein or depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Consultant any defects in such work that render it unsuitable for proper execution and results. Its failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work covered by the Contract, except as to latent defects which may be discovered thereafter.

Section 2.17 Inspection and Testing

(1) All materials and workmanship shall be subject to inspection, examination and testing by the Consultant and the Fund at all times during the performance of the work and at all places where the work is carried on. Except as otherwise herein specified, the Fund shall pay for the cost of inspection, examination and testing by the Consultant or the Fund. If, however, the tests prove that the materials and/or work tested do not meet the requirements of the Contract, then the entire cost of such tests and any additional testing and or inspections required until the work is deemed compliant is to be borne by the Contractor. The Consultant will have the right to reject defective material and workmanship furnished by the Contractor or require its correction. The Contractor, without charge therefor, shall satisfactorily and promptly correct all rejected work and replace all rejected material with proper material.

(2) The Contractor shall promptly segregate and remove from the site of the work all rejected material and work. If the Contractor shall fail to proceed at once with the replacing of rejected material and/or correction of defective workmanship, the Fund may, by contract or otherwise, replace such material and/or correct such workmanship, and charge the costs thereof to the Contractor or it may cancel the Contract and terminate the Contractor's employment as provided in the Agreement.

(3) The Contractor, without additional charge, shall promptly furnish all reasonable facilities, labor materials and equipment with associated operators necessary for the safe and convenient access, inspection and testing that may be required by the Consultant or the Fund.

(4) If the Contract Documents or the Consultant's instructions or the applicable laws, ordinances or

regulations of any governmental authority require any part of the work covered by the Contract to be specially tested or inspected, the Contractor shall give the Consultant timely notice of its readiness for such testing or inspection or, if the same is to be performed by a governmental authority, of the date fixed therefor. If any such work, without the written permission of the Consultant, should be covered up prior to such testing or inspection, the Contractor, at its sole cost and expense must, if directed by the Consultant, uncover the same for testing or inspection and reconstruct same after the tests or inspection are conducted. All certificates of inspection or testing, involving the Contractor's work, required to be obtained from governmental authorities are to be secured by the Contractor at its sole cost and expense.

(5) Should it be considered necessary or advisable by the Consultant at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out same, the Contractor, upon request, shall furnish all necessary facilities, labor and material to perform such examination. If the work subject to such examination is found to be defective or nonconforming in any manner due to the fault of the Contractor or any of its subcontractors, such uncovering or destruction and necessary reconstruction, even though such includes work not covered in the Contract, shall be at the expense of the Contractor. If, however, such work after testing and examination is found to be satisfactory, the Fund will pay the Contractor the cost of such uncovering or destruction and reconstruction, such cost to be determined as in the case of extra work as provided in Sections 4.02 and 4.05A.

(6) Inspection of material and furnished articles to be incorporated in the work may be made at the place of production, manufacture or shipment unless otherwise stated herein. The inspection of material and workmanship for final acceptance as a whole or in part will be made at the site of the work.

Section 2.18 Subcontractors

(1) Except for subcontractors designated by the Fund, or required to be named at any earlier date, pursuant to the provisions of the Information for Bidders, within thirty (30) calendar days after receipt of the Notice to Proceed, the Contractor must submit a written statement to the Consultant giving the name and address of all proposed subcontractors. Said statement must contain a description of the portion of the work and materials which the proposed subcontractors are to perform and furnish and any other information tending to prove that the proposed

subcontractors have the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and provisions of the Contract Documents.

(2) If the Consultant finds that the proposed subcontractors are qualified, it will so notify the Contractor within ten (10) working days after receipt of the aforesaid information. If the determination is to the contrary, however, the Consultant within such period will notify the Contractor of such determination and the latter, unless it decides to do such work itself and is qualified, in the Consultant's opinion, to do such work, must, within ten (10) working days thereafter, submit similar information with respect to other proposed subcontractors.

(3) The Consultant's approval of a subcontractor and/or the Fund's designation of a subcontractor pursuant to the provisions of the Contract Documents shall not relieve the Contractor of any of its responsibilities, duties and liabilities hereunder. The Contractor shall be solely responsible to the Fund for the acts or defaults of such subcontractors and of such subcontractors' officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

(4) The Contractor shall be fully responsible for the administration, integration, coordination, direction and supervision of all of its subcontractors and of all work and it shall check all space requirements of the work and coordinate and adjust the same so that conflicts in space do not occur in the work being performed by it with its own employees and with the work being performed by its subcontractors and so that all equipment, piping, wiring, etc., can be installed, where possible, in the spaces allowed for same.

(5) No subcontractor shall be permitted to work at the site until: (a) it has furnished satisfactory evidence to the Consultant of the insurance required by law; (b) in the case of a Project involving a federal grant, it has furnished satisfactory evidence to the Consultant of the same type and amount of liability insurance as that required of the Contractor by Section 5.06 of the Agreement; and (c) except for subcontractors designated by the Fund pursuant to the provisions of the Information for Bidders, it has been approved by the Consultant.

(6) Within ten (10) working days after the Contractor receives payment from the Fund on account of a progress payment application for the percentage of the work done, it shall pay each of its

subcontractors the sum contained in said payment for the percentage of said subcontractor's work, less the same amount retained therefrom by the Fund under the terms of the Contract Documents or in consequence of any legal proceedings or statutory liens, and less any amounts due the Contractor under the subcontract for work not performed or not properly or timely performed by the subcontractor. In the event any subcontractor is not paid by the Contractor, the former should immediately notify the Fund of such fact.

(7) The Contractor shall execute with each of its subcontractors and shall require all subcontractors to execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Contract insofar as such terms and provisions are applicable to the work to be performed by such subcontractors. The Contractor shall require all subcontractors and sub-subcontractors to promptly, upon request, file with the Consultant and the Fund a conformed copy of such agreements, from which the price and terms of payment may be deleted.

(8) If for sufficient reason, at any time during the progress of the work to be performed hereunder, the Consultant determines that any subcontractor or sub-subcontractor is incompetent, careless, or uncooperative, the Consultant will notify the Contractor accordingly and immediate steps will be taken by the Contractor for cancellation of such subcontract or sub-subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor or sub-subcontractor for loss of prospective profits on work unperformed and/or work unfurnished and a provision to that effect shall be contained in all subcontracts and sub-subcontracts.

(9) No provisions of this Contract shall create or be construed as creating any contractual relation between the Fund and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

Section 2.19 Shop Drawings and Samples

(1) The Contractor in accordance with the approved Shop Drawing, Submittal, Mockup, and Sample schedules and with such promptness and in such sequence as to cause no delay in the work, shall submit for the Consultant's approval all Shop Drawings and Samples called for under the Contract or requested by the Consultant.

(2) Shop Drawings and mock-ups shall establish the actual detail of the work, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings include drawings, diagrams, schedules, product data and other information or materials specially prepared for the work by the Contractor to illustrate some portion of the work. Product data include standard illustrations, schedules, performance charts, instructions, brochures, diagrams and other information identified by the Contractor to illustrate materials or equipment for some portion of the work.

(3) All Shop Drawings, mock-ups and samples shall be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Consultant for approval and all Shop Drawings shall bear the Contractor's recommendation for approval. Any Shop Drawings submitted without this stamp of approval and certification, and Shop Drawings which, in the Consultant's opinion, are incomplete, contain numerous errors or have not been checked or only checked superficially, will be returned unchecked by the Consultant for resubmission by the Contractor. In checking Shop Drawings, the Contractor shall verify all dimensions and field conditions and shall check and coordinate the Shop Drawings of any section or trade with the requirements of all other sections or trades whose work is related thereto, as required for proper and complete installation and sequence of the work.

(4) Samples must be of sufficient size or number to show the quality, type, range of color, finish and texture of the material. Each Sample shall be properly labeled to show the nature of the material, trade name of manufacturer, name and location of the work where the material represented by the Sample is to be used and the name of the Contractor submitting the Sample. Transportation charges to the Consultant must be prepaid on Samples forwarded to it.

(5) At the start of the Project, the format for submittals shall be established by the Fund. If an electronic method is selected for the submission and approval of submittals, the Contractor shall provide submittals in a PDF format and the Consultant will return the submittals in electronic format to the Contractor. For both hard-copy and electronic submittal formats, all submittals that require physical samples or mock-ups shall be provided in accordance with the requirements set forth in the Contract Specifications. Shop Drawings and Samples,

submitted by the Contractor in accordance with the approved Shop Drawing and Sample schedule that is included in the Time Progress Schedule, will be reviewed by the Consultant within fifteen (15) working days and if satisfactory will be approved. A Shop Drawing, when approved, will be returned to the Contractor. If not satisfactory, the Drawings and Samples will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall resubmit to the Consultant a corrected copy of the Shop Drawing or a new Sample, as the case may be. The Contractor shall make any correction required by the Consultant and shall appropriately note any changes or revisions on the Shop Drawing, dated to correspond with the date of the Consultant's request for the change. Upon approval of the Shop Drawing by the Consultant, the Contractor shall promptly furnish to the Consultant as many copies thereof as the Consultant may reasonably request. Should more than two (2) separate reviews of any required shop drawings or samples submitted be necessary, in the judgement of the Consultant and the Fund, the Contractor shall be responsible for the reasonable costs incurred by the Fund for such additional reviews by the Consultant.

(6) At the time of submission of a Shop Drawing or Sample, the Contractor shall inform the Consultant and the Fund in writing of any deviation in the Shop Drawing or Sample from the requirements of the Contract Documents. Unless such deviation is specifically noted by the Contractor with a notation that such deviation will result in extra work for which the Contractor requests payment, the Contractor shall be deemed to have waived any claim for extra work, additional compensation or payment or an extension of time with respect to all work shown on, described in or related to the Shop Drawing or Sample.

(7) The Consultant's approval of Shop Drawings or Samples is for design only and is not a complete check on the method of assembly, erection or construction. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, except where the Contractor, in accordance with the provisions of paragraph 6 of this Section, has previously notified the Fund and the Consultant of such departure; (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, omissions or otherwise that may exist; (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength; (d) relieving the Contractor of full responsibility for satisfactory performance of all work and coordination with the work of all subcontractors

and other contractors; or (e) permitting departure from additional details or instructions previously furnished by the Consultant.

(8) No work requiring a Shop Drawing or Sample shall be commenced until a Shop Drawing or Sample is approved by the Consultant and all such work shall be: (a) in accordance with the approved Shop Drawing, provided the latter conforms in all respects to the Contract Documents or to such deviations therefrom as have been previously noted by the Contractor in accordance with the provisions of paragraph 6 of this Section; and (b) in conformance in all respects to the sample furnished to and approved by the Consultant and, unless otherwise specified, as new and of good quality.

(9) The Contractor may be required to provide professional services that constitute the practice of architecture or engineering when specifically required by the Contract Documents for a portion of the work or the Contractor needs to provide such services in order to carry out its responsibilities for construction means, methods, techniques, sequences and procedures. When professional services are required in the Contract Documents, the Consultant will specify all performance and design criteria that such services must satisfy. The Fund and Consultant shall be entitled to rely on the adequacy, accuracy and completeness of the professional services, certifications, and approvals performed or provided by design professionals working for the Contractor.

(10) Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% in the review or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.19.

Section 2.20 Equivalents - Approved Equal

(1) Equivalents or Approvals - General

a. The words "similar and equal to", or equal", "equivalent" and such other words of similar content and meaning shall for the purposes of this Contract be deemed to mean similar and equivalent to one of the named products. For the purposes of subdivisions (1) and (2) of this Section and for the purposes of the Bidding Documents, the word "products" shall be deemed to include the words "articles", "materials", "items", "equipment" and "methods". Whenever in the Contract

Documents one or more products are specified, the words "similar and equal to" shall be deemed inserted.

- b. Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent is not to limit competition, but to establish a standard of quality which the Consultant has determined is necessary for the Project. A Contractor may at its option use any product other than that specified in the Contract Documents provided the same is approved by the Consultant in accordance with the procedures set forth in subdivision (2) of this Section. In all cases the Consultant shall be the sole judge as to whether a proposed product is to be approved and the Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Consultant, that the proposed product is similar and equal to the named product. In making such determination the Consultant may establish such objective and appearance criteria as it may deem proper that the proposed product must meet in order for it to be approved.
- c. Nothing in the Contract Documents shall be construed as representing, expressly or implied, that the named product is available or that there is or there is not a product similar and equal to any of the named products and the Contractor shall have and make no claim by reason of the availability or lack of availability of the named product or of a product similar and equal to any named product.
- d. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Consultant in considering a product proposed by the Contractor or by reason of the failure of the Consultant to approve a product proposed by the Contractor.
- e. Requests for approval of proposed equivalents will be received by the Consultant only from the Contractor.
- f. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, sequence of work, omissions or otherwise that may exist, (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or

deficiencies in strength, (d) relieving the Contractor of full responsibility for satisfactory performance of all work to achieve a functionally complete facility or result and coordination with the work of all subcontractors and other contractors or (e) permitting departure from additional details or instructions previously furnished by the Consultant.

- g. Contractor agrees that the Contractor approves and authorizes the deduction from Contractor's applications for payment any and all costs incurred by the Construction Manager, Consultant, Design Professional or otherwise in evaluating Contractor's submissions under this Section 2.20, together with a markup upon such hard costs in the amount of 15%.

(2) **Equivalents or Approvals After Bidding**

- a. Any and all submissions for "or equal" products which are submitted by the Contractor after award of the Contract must be made by the Contractor within ninety (90) calendar days after the date of award. Contractor agrees that it waives and relinquishes the right, claim or privilege, if any, to submit "or equal" proposals if such are made ninety (90) calendar days after the date of award of the Contract to the Contractor.
- b. Requests for approval of proposed equivalents will be considered by the Consultant after bidding only in the following cases: (a) the named product cannot be obtained by the Contractor because of strikes, lockouts, bankruptcies or discontinuance of manufacture and the Contractor makes a written request to the Consultant for consideration of the proposed equivalent within ten (10) calendar days of the date it ascertains it cannot obtain the named product; or (b) the proposed equivalent is superior, in the opinion of the Consultant, to the named product; or (c) the proposed equivalent, in the opinion of the Consultant, is equal to the named product and its use is to the advantage of the Fund, e.g., the Fund receives an equitable credit, acceptable to it, as a result of the estimated cost savings to the Contractor from the use of the proposed equivalent or the Fund determines that the Contractor has not failed to act diligently in placing the

necessary purchase orders and a savings in the time required for the completion of the construction of the Project should result from the use of the proposed equivalent.

- c. Where the Consultant pursuant to the provisions of this subdivision approves a product proposed by a Contractor and such proposed product requires a revision or redesign of any part of the work covered by this Contract, all such revision and redesign and all new Drawings and details required therefor shall be subject to the approval of the Consultant and shall be provided by the Contractor at its own cost and expense.
- d. Where the Consultant pursuant to the provisions of this Section approves a product proposed by a Contractor and such proposed product requires a different quantity and/or arrangement of duct work, piping, wiring, conduit or any other part of the work from that specified, detailed or indicated in the Contract Documents, the Contractor shall provide the same at its own cost and expense.

- (3) Contractor agrees that the Fund may deduct from any application for payment made by the Contractor any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund, together with a markup upon such hard costs in the amount of 15%, in the consideration or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.20.

Section 2.21 Patents, Trademarks and Copyrights

The Contractor acknowledges that the Contract consideration includes all royalties, license fees and costs arising from patents or trademarks in any way involved in the work; provided, however, that the Contract consideration shall not be deemed to have included therein any royalty, license fee or cost arising from a patent or trademark for a design prepared by the Consultant and the Contractor shall have no liability in connection therewith. Where the Contractor is required or desires to use any product, device, material or process covered by patent or trademark, the Contractor shall indemnify and save harmless the Fund from any and all claims, actions, causes of action or demands, for infringement by reason of the use of such patented product, device, material or process, and shall indemnify the Fund from any cost, liability,

damage and expense, including reasonable attorneys' fees and court costs, which it may be obligated to incur or pay by reason of any claim or infringement at any time both before or after the Fund's final acceptance of all the work to be performed under the Contract.

Section 2.22 Possession Prior to Completion

If before the final completion of all the work it shall be deemed advisable or necessary by the Fund to take over, use, occupy or operate any part of the completed or partly completed work or to place or install therein equipment and furnishings, the Fund, upon reasonable written notice to the Contractor, shall have the right to so do and the Contractor will not in any way interfere therewith or object to the same. Such action by the Fund shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract Documents and the Contractor acknowledges that such action by the Fund does not in any way evidence the completion of the work or any part thereof or in any way signify the Fund's acceptance of the work or any part thereof. The Contractor agrees to continue the performance of all work covered by the Contract in a manner which will not unreasonably interfere with such takeover, use, occupancy, operation, placement or installation.

Section 2.23 Completion and Acceptance

(1) Partial Completion

If before the final completion of all the work any portion of the permanent construction has been satisfactorily completed and the same will be immediately useful to the Fund, the latter may, by written notice, advise the Contractor that it accepts such portion of the work. Such action by the Fund shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any work not so completed and accepted. The partial completion of any portion of the Contractor's work by the Fund, the Campus or the Consultant, shall not impact the assessment of liquidated damages or actual costs for delays or disruption to the Project caused by the Contractor, its subcontractors or vendors.

(2) Substantial Completion

When all the Work covered by the Contract is substantially completed, as defined in Section 1.01, the Contractor shall give written notice thereof to the Fund and the Consultant. The latter will then promptly make an inspection of the work and, if they shall determine that all the work is substantially completed, they shall so advise the Contractor. Such action shall

in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any uncompleted (including untested or deferred work), unaccepted or corrective work or in any way affect, limit or preclude the issuance by the Consultant, from time to time thereafter, of "Punch Lists", i.e., lists of uncompleted or corrective work which the Contractor is to promptly complete and/or correct. In the judgement of the Fund, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

The Contractor must fully, completely and acceptably perform all Punch List work and any other work subsequently discovered remaining to be completed or corrected, within ninety (90) calendar days of Substantial Completion or within such other timeframe stipulated by the Fund or Consultant. Failure to complete the Punch List within the time so designated hereunder may be deemed default on the part of the Contractor.

(3) Final Completion and Acceptance

After the completion of all the work the Contractor shall give written notice to the Fund and the Consultant that all the work is ready for inspection and final acceptance. The Fund and the Consultant shall promptly make such inspection and, if they shall determine that all the work has been satisfactorily completed, the Fund shall thereupon by written notice advise the Contractor that it accepts such work. In the judgement of the Fund, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

Section 2.24 Record Drawings

(1) At the start of the Project, the format for Record Drawings shall be established by the Fund. Prior to acceptance by the Fund of all work covered by the Contract, the Contractor shall furnish to the Consultant one (1) set of current Contract Drawings on which the Contractor has recorded, using colored

pencil for hard copy format or electronic editing tool in contrasting color for electronic format, in a neat and workmanlike manner, all instances where actual field construction differs from work as indicated on the Contract Drawings. These "Record". Drawings shall show the following information: (a) all significant changes in plans, sections, elevations and details, such as shifts in location of walls, doors, windows, stairs and the like made during construction; (b) all significant changes in foundations, columns, beams, openings, concrete reinforcing, lintels, concealed anchorages and "knock-out" panels made during construction; (c) final location of electric panels, final arrangement of electric circuits and any significant changes made in electrical design as a result of Change Orders, Field Orders or job conditions; (d) final location and arrangement of all mechanical equipment and major concealed plumbing, including, but not limited to, supply and circulating mains, vent stacks, sanitary and storm water drainage; (e) final location and arrangement of all underground utilities, connections to building and/or rerouting of existing utilities, including, but not limited to, sanitary, storm, heating, electric, signal, gas, water and telephone; and (f) final make and model for all significant equipment and devices listed in the specifications. The Contractor shall also provide an electronic version as determined by the Consultant.

(2) Periodically during the work, the Consultant may request submission of a progress set of Record Drawings for review and advise the Contractor of errors or omissions, if any, that must be corrected or completed prior to final submission of the Record Drawings. Shop Drawings shall not be acceptable as Record Drawings.

(3) The Contractor shall submit the Record Drawings to the Consultant at least fifteen (15) days prior to the date of Substantial Completion. The Consultant will then review the Record Drawings and, if they shall determine that the Record Drawings represent the actual field construction being completed, they shall so advise the Contractor. If not satisfactory, the Record Drawings will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall promptly correct and resubmit to the Consultant a corrected copy of the Record Drawings. Acceptance of the Record Drawings by the Fund is a condition precedent to the Contractor's entitlement to receive Final Payment.

Section 2.25 Guarantees

(1) The Contractor, at the convenience of the Fund, shall remove, replace and/or repair at its own cost and expense any defects in workmanship, materials, ratings, capacities or characteristics occurring in or to the work covered by the Contract within one (1) year or within such longer period as may otherwise be provided in the Contract, the period of such guarantee to commence with the Fund's final acceptance of all work covered under the Contract or at such other date or dates as the Fund may specify prior to that time, and the Contractor, upon demand, shall pay for all damage to all other work resulting from such defects and all expenses necessary to remove, replace and/or repair such other work which may be damaged in removing, replacing or repairing the said defects. The obligations of the Contractor under the provisions of this paragraph or any other guarantee provisions of the Contract Documents are not limited to the monies retained by the Fund under the Contract.

(2) Unless such removal, replacement and/or repair shall be performed by the Contractor within ten (10) working days after it receives written notice from the Fund specifying such defect, or if such defect is of such a nature that it cannot be completely removed, repaired and/or replaced within said ten (10) day period and the Contractor shall not have diligently commenced removing, repairing and/or replacing such defect within said ten (10) day period and shall not thereafter with reasonable diligence and in good faith proceed to do such work, the Fund may employ such other person, firm or corporation as it may choose to perform such removal, replacement and/or repair and the Contractor agrees, upon demand, to pay to the Fund all amounts which it expends for such work.

Section 2.26 Default of Contractor

(1) In addition to those instances specifically referred to in other Sections hereof, the Fund shall have the right to declare the Contractor in default of the whole or any part of the work if:

- a. The Contractor becomes insolvent; or if
- b. The Contractor makes an assignment for the benefit of creditors pursuant to the statutes of the State of New York; or if
- c. A voluntary or involuntary petition in bankruptcy is filed by or against the Contractor; or if

- d. A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if
- e. The Contractor fails to commence work when notified to do so by the Consultant; or if
- f. The Contractor shall abandon the work; or if
- g. The Contractor shall refuse to proceed with the Work or extra Work when and as directed by the Consultant or Fund; or if
- h. The Contractor shall without just cause reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the Fund, to complete the work in accordance with the approved time progress schedule, and shall fail or refuse to sufficiently increase such working force when ordered to do so by the Consultant; or if
- i. The Contractor shall sublet, assign, transfer convey, or otherwise dispose of the Contract other than as herein specified; or if
- j. The Fund shall be of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if
- k. The Fund shall be of the opinion that the work cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the Fund's opinion, attributable to conditions within the Contractor's control; or if
- l. The work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if
- m. The Fund shall be of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Contract;
- n. The Fund shall be of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms; or if
- o. At any time during the period of the Agreement, insurance as required is not in effect or proof thereof is not provided to the Fund.

(2) Before the Fund shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items *a, b, c, d, e, f, g, h, j, k, l, m, n* and *o*, it shall give the Contractor three (3) working days' notice of its intention to declare the Contractor in default and unless, within such three (3) day period, the Contractor shall make arrangements, satisfactory to the Fund, to correct and/or eliminate the conditions set forth in the Fund's aforesaid notice, the Contractor may be declared in default at the expiration of such three (3) day period or at the expiration of such longer period of time as the Fund may determine.

(3) The right to declare in default for any of the grounds specified or referred to shall be exercised by the Fund sending the Contractor a written notice setting forth the ground or grounds upon which such default is declared. Upon receipt of notice that it has been declared in default, the Contractor shall immediately discontinue all further operations under the Contract and shall immediately quit the site, leaving untouched all plant, materials, equipment, tools and supplies then on site.

(4) The Fund, after declaring the Contractor in default, may then have the work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or it may call upon the Contractor's surety at its own expense to do so.

(5) In the event that the Fund declared the Contractor in default of the work or any part of the work, the Contractor, in addition to any other liability to the Fund hereunder or otherwise provided for or allowed by law, shall be liable to the Fund for any costs it incurs for additional architectural and engineering services necessary, in its opinion, because of the default and the total amount of liquidated damages from the date when the work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the work, both of which items shall be considered as expenses incurred by the Fund in completing the work and the amount of which may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the work had been completed without a default.

(6) If the Fund completes the work, the Consultant shall issue a certificate stating the expenses incurred in such completion, including the

cost of re-letting. Such certificate shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.

(7) The expense of such completion, as so certified by the Consultant, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the work; the balance of such monies, if any, subject to the other provisions of the Contract, to be paid to the Contractor without interest after such completion. Should the expense of such completion, so certified by the Consultant, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, any such excess shall be paid by the Contractor to the Fund upon demand.

(8) In the event the Fund shall determine to complete the work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said work shall be wholly completed and accepted by the Fund.

(9) In case the Fund shall declare the Contractor in default as to a part of the work only, the Contractor shall discontinue such part, shall continue performing the remainder of the work in strict conformity with the terms of the Contract, and shall in no way hinder or interfere with any other contractors or persons whom the Fund may engage to complete the work as to which the Contractor was declared in default.

(10) The provisions relating to declaring the Contractor in default as to the entire work shall be equally applicable to a declaration of partial default, except that the Fund shall be entitled to utilize for completion of the part of the work as to which the Contractor was declared in default only such plant, materials, equipment, tools and supplies as had been previously used by the Contractor on such part.

(11) In completing the whole or any part of the work, the Consultant and the Fund shall have the power to depart from, change or vary the terms and provisions of the Contract; provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variations, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Consultant's certificate of the cost of completion, nor shall it constitute a defense to any action to recover the amount by which such certificate exceeds the

amount which would have been payable to the Contractor hereunder but for its default.

(12) The provisions of this Section shall be in addition to any and all other legal or equitable remedies provided by this Agreement and otherwise applicable by law.

Section 2.27 Termination for Convenience

(1) The performance of work under this Contract may be terminated by the Fund, in whole or in part, whenever the Fund shall determine that such termination is in the best interest of the Fund. Any such termination shall be effected by a notice in writing to the Contractor specifying the date upon which such termination shall become effective and the extent to which performance of the Contract shall be terminated. Such termination shall be effective on the date and to the extent specified in said notice.

(2) Upon receipt of a notice of termination, and except as otherwise directed in writing by the Fund, the Contractor shall:

- a. Discontinue all work and the placing of all orders for materials and facilities otherwise required for the performance thereof;
- b. Cancel all existing orders and subcontracts to the extent such orders and subcontracts relate to the performance of work terminated by the notice of termination;
- c. Take such action as may be necessary to secure to the Fund the benefits of any rights of the Contractor under orders or subcontracts which relate to the performance of work terminated by the notice of termination, including, but not limited to, the assignment to the Fund, in the manner and to the extent directed by the Fund, all the right, title and interest of the Contractor under the orders or subcontracts so terminated and cancelled. In the event of such assignment, the Fund shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination and cancellation of such orders and subcontracts;
- d. Transfer title and deliver to the Fund, in accordance with the direction of the Fund, all materials, supplies, work in process, facilities, equipment, machines or tools produced as a part of or acquired by the Contractor in connection with the work terminated by said notice, and all plans, Drawings, Working Drawings, sketches, Specifications and information for use in

connection therewith; provided, however, that the Contractor may retain any of the foregoing if it so elects and foregoes reimbursement therefor;

- e. Take such action as may be necessary or as the Consultant or the Fund may prescribe for the protection and preservation of all property in the possession or control of the Contractor in which the Fund, under the provisions of the Contract, has or may acquire an interest.

(3) Notwithstanding the foregoing, should the notice of termination relate to only a portion of the work covered by the Contract, the Contractor will proceed with the completion of such portions of the work as are not terminated.

(4) The Fund will pay and the Contractor shall accept, in full consideration for the performance and completion of the portions of the work as are not terminated, a sum calculated by determining the percentage the portions of the work not terminated bear to the total amount of the work covered by the Contract, and by multiplying the Contract consideration by such percentage - the product thereof being the amount to be paid to the Contractor. The Fund shall determine the amount of such consideration in accordance with the foregoing.

(5) Upon compliance by the Contractor with the foregoing provisions of this Section and subject to deductions for payments previously made, the Fund, for the portions of the work terminated, shall compensate the Contractor as follows:

- a. By reimbursing the Contractor for actual expenditures made with respect to such work, including expenditures made in connection with any portion thereof which may have been completed prior to termination, as well as expenditures made after termination in completing those portions of the work covered by the Contract which the Contractor may have been required by the notice of termination to complete. The Fund shall determine the allowability and amount of such expenditures.
- b. By reimbursing the Contractor for all actual expenditures made, with the prior written approval of the Fund or pursuant to a court judgment, in settling or discharging any outstanding contractual obligations or commitments incurred or entered into by the Contractor in good faith with respect to the Contract and resulting from the termination thereof.

- c. By reimbursing the Contractor for all actual expenditures made after the effective date of the notice of termination resulting from or caused by the Contractor taking necessary action or action prescribed by the Consultant or the Fund for the protection and preservation of all property in the possession or control of the Contractor in which the Fund, under the provisions of the Contract, has or may acquire an interest.

- d. By paying the Contractor a markup, which is to be calculated in the same manner as that provided for in subdivision c of paragraph (1) of Sections 4.02 and 4.05A for extra work, on the foregoing expenditures, which markup is to cover the Contractor's overhead and profit; provided, however, that if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, said markup shall be reduced by one-third.

(6) The sum of all amounts payable under this Section, plus the sum of all amounts previously paid by the Fund under the provisions of the Contract, shall not exceed the amount of the Contract consideration. In no event shall the Contractor be entitled to any payment for loss of anticipated profits on uncompleted work and the Fund shall not be liable for same.

(7) Termination by the Fund under the provisions of this Section shall be without prejudice to any claims or rights which the Fund may have against the Contractor. The Fund may retain from the amount due to the Contractor under the provisions of this Section such monies as may be necessary to satisfy any claim which the Fund may have against the Contractor in connection with the Contract; provided, however, that the Fund's failure to retain such monies shall not be deemed a waiver of any of its rights or claims against the Contractor.

(8) Notwithstanding the foregoing, where the Contractor and the Consultant can agree upon another method of determining the amount of the consideration to be paid to the Contractor under the provisions of this Section, such method, subject to the approval of the Fund, may, at the option of the Fund, be substituted for the method set forth above.

Article III Time of Performance

Section 3.01 Commencement, Prosecution and Completion of Work

(1) The Contractor agrees that it will begin the work herein embraced upon receipt of the Notice to Proceed, unless the Fund consents, in writing, to begin at a different date, and that it will prosecute the same with such diligence that all work covered by the Contract shall be substantially completed and performed on or before the time specified on page A-1 of the Agreement.

(2) The Contractor further agrees that time is of the essence in this Contract and that all the Work shall be prosecuted in such manner and with sufficient plant and forces to complete all Work timely.

Section 3.02 Time Progress Schedule

(1) To show compliance with the requirements of Section 3.01 of the Agreement, provide and maintain a Time Progress Schedule in accordance with the General Requirements, Special Conditions, Section paragraph titled "Project Schedule". Unless otherwise accepted by the Fund, the Time Progress Schedule shall be strictly adhered to by the Contractor. The time for substantial completion shall be on or before the time specified on page A-1 of the Agreement.

(2) If through the fault of the Contractor or any subcontractor the Contractor shall fail to adhere to the time progress schedule, it must promptly adopt such other and additional means and methods of construction as will make up for the time lost and will assure completion in accordance with such schedule.

(3) The failure of the Contractor to submit a Time Progress Schedule, the Fund's or the Consultant's acceptance of the Contractor's time progress schedule or lack of such acceptance, the means and/or methods of construction employed by the Contractor, including any revisions thereof, and/or its failure to revise the same shall not relieve the Contractor of its obligation to accomplish the result required by the Contract in the time specified on page A-1 of the Agreement, nor shall the exercise of the Consultant's or the Fund's right to reject any portion of the work, create or give rise to any claim, action or cause of action, legal, equitable or otherwise, against the Consultant or the Fund.

(4) The failure of the Contractor to submit and maintain a Time Progress Schedule in accordance with the General Requirements shall be deemed to be a waiver by the Contractor of all claims for additional

compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work.

Section 3.03 Time Progress Schedule for Shop Drawings and Samples

The Contractor shall include activities for preparation and submission of all Shop Drawings, mock-ups and Samples in the Time Progress Schedule in Section 3.02.

Section 3.04 Notice of Conditions Causing Delay

(1) Within ten (10) working days after the commencement of any condition which is causing or may cause delay in completion or require Contractor to request an extension of time, the Contractor must notify the Consultant and the Fund in writing of the effect, if any, of such condition upon the Time Progress Schedule, and must state why and in what respects, if any, the condition is causing or may cause such delay.

(2) Contractor agrees that an express condition precedent to Contractor's entitlement to any extension of time on the project shall be full and complete compliance to the satisfaction of the Fund with the Contractor's obligations in Section 3.06, Contractor's Progress Reports. Failure to submit proper Contractor's progress reports in appropriate and timely fashion shall be deemed a waiver and relinquishment of any right, claim or privilege to obtain an extension of time for the performance of the Contractor's work.

(3) Failure to strictly comply with this requirement may, in the discretion of the Fund, be deemed sufficient cause to deny any extension of time on account of delay in completion arising out of or resulting from any change, extra work, suspension, or other condition.

(4) Except as otherwise set forth in this Section 3.04 all procedures set forth in Sections 2.02 and 2.03 of this Agreement shall be complied with by the Contractor. Furthermore, full and complete compliance with the requirements of this Article III is a condition precedent to the Contractor's entitlement to receive an extension of time.

Section 3.05 Extension of Time

(1) Within ten (10) working days after the commencement of any condition which is causing or

may cause the Contractor to incur, require or otherwise need an extension of time, the Contractor shall notify the Consultant and the Fund of such condition. Full and complete compliance with this paragraph 3.05(1) is a condition precedent to the Contractor obtaining an extension of time for performance of any portion or all of its work.

(2) An extension or extensions of time for the completion of the work may be granted by the Fund subject to the provisions of this Section, but only upon written application therefor by the Contractor to the Fund and the Consultant.

(3) An application for an extension of time must set forth in detail the source and the nature of each alleged cause of delay in the completion of the work, the date upon which each such cause of delay began and ended and the number of days of delay attributable to each of such causes. It must be submitted prior to completion of the work.

(4) If such an application is made, the Contractor may be entitled to an extension of time for delay in completion of the work caused solely: (a) by the acts or omissions of the Fund, its trustees, officers, agents or employees; or (b) by the acts or omissions of other contractors, not including subcontractors of the Contractor, on this Project; or (c) by unforeseeable supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes).

(5) The Contractor may, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the Fund may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section and Section 3.04. The Fund shall make such determination within ninety (90) calendar days after receipt of the Contractor's application for an extension of time; provided, however, said application complies with the requirements of this Section.

(6) The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the Fund, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of its subcontractors or material-men

and would of itself (irrespective of the concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such an act, fault or omission.

(7) The granting of an application for an extension of time for causes of delay other than those herein referred to shall be entirely within the discretion of the Fund.

(8) If the Contractor shall claim to have sustained any damages by reason of delays, extraordinary or otherwise, or hindrances which it claims to be due to any action, omission, direction or order by the Fund or the Consultant, the Contractor shall be entitled only to an extension of time as hereinabove provided and shall not have or assert any claim or prosecute any suit, action, cause of action or proceeding against the Fund based upon such delays or hindrances, unless such delays or hindrances were caused by the Fund's bad faith or its willful, malicious, or grossly negligent conduct, or un contemplated delays, or delays so unreasonable that they constitute an intentional abandonment of the Contract by the Fund, or delays resulting from the Fund's breach of a fundamental obligation of the Contract.

(9) The Contractor shall not be entitled to an extension of time for the performance of any or all of the Work set forth in allowances to the Contract. All allowance work shall be performed in accordance with the Contractor's schedule.

Section 3.06 Contractor's Progress Reports

After commencement of the work the Contractor shall furnish the Consultant with written monthly reports setting forth the condition and progress of the work, the percentage of each part of the work that has been finished, those parts of the work which have been completed within the scheduled time and those parts of the work which have not been finished within the scheduled time, and the general progress of the work that is being performed away from the site and the approximate date when such work will be finished and delivered to the site. Contractor agrees that compliance with this Section 3.06 is an express condition precedent to the Contractor's right, claim or entitlement to obtain an extension of time for the performance of the Contractor's work. Failure to comply with this Section 3.06 shall be a waiver and relinquishment of all such rights, claims and privileges to request or obtain an extension of time for the performance of Contractor's work.

Article IV Payment

Section 4.01 Compensation to Be Paid Contractor

The Fund shall pay to the Contractor and the latter shall accept as full and complete payment for the performance of this Contract, subject to additions or deductions as provided herein, the sum of _____ which sum is the amount of the Contract consideration.

Section 4.02 Value of Omitted and Extra Work

(1) The amount by which the Contract consideration is to be increased or decreased by any Change Order or Field Order shall be determined by the Fund by one or more of the following methods:

- a. By applying the applicable price or prices set forth on the attached Schedule "I" of this Agreement or by applying a unit price agreed to by both parties. Subject to the provisions of Section 4.04, this method must be used if the Contract Documents contain applicable unit prices.
- b. By estimating the fair and reasonable cost of: (i) labor, including all wages, required wage supplements and insurance required by law (workers' compensation, social security, disability, unemployment, etc.) paid to or on behalf of foremen, workers and other employees below the rank of superintendent directly employed at the site of the Project; (ii) materials; and (iii) equipment, excluding hand tools, which, in the judgment of the Fund, would have been or will be employed exclusively and directly on the omitted work or extra work, as the case may be; and, in the case of extra work, where the same is performed directly by the Contractor, by adding to the total of such estimated costs a sum equal to 15 percent thereof, but, where the extra work is performed by a subcontractor, by adding a sum equal to 15 percent of said costs for the benefit of such subcontractor, and by adding, for the benefit of the Contractor (no further allowance will be made where extra work is performed by the sub-subcontractor), an additional sum equal to 10 percent of the first \$10,000 of the above-estimated costs, including the subcontractor's percentage override, plus 5 percent of the next \$90,000 of the total of said items, plus 3 percent of any sum in excess of \$100,000 of the total of said items. There is no markup on the premium portion of overtime labor. For the purposes of the aforesaid

percentage overrides, the words "extra work" shall be defined as a complete item of added, modified or changed work as described in the Consultant's written instructions to the Contractor. Such "extra work" may include the work of one or more trades and/or subcontractors or sub-subcontractors and shall include all labor, materials, plant, equipment, tools and all incidentals directly and/or indirectly necessary, related, involved in or convenient to the successful completion of the extra work item. Where the Consultant's aforesaid written instructions to the Contractor involve both an increase and a reduction in similar or related work, the above percentage overrides will be applied only on the amount, if any, the cost of the increased work exceeds the cost of the reduced work.

No overhead and profit shall be retained by the Contractor on the cost of work determined by the method provided in Subparagraph (1)a.

All profit, overhead and expense of whatsoever kind and nature, other than those set forth above in items (i) through (iii), of the Contractor, its subcontractors and sub-subcontractors, are covered by the aforesaid percentage overrides and no additional payment therefor will be made by the Fund.

The Fund may make such cost estimate either before or after the extra work is completed by the Contractor.

- c. By determining the actual cost of the extra work in the same manner as in the above subdivision b except that actual costs of the Contractor shall be utilized in lieu of estimated costs. The Fund shall have the option to utilize this method provided it notifies the Contractor of its intent to do so prior to the time the Contractor commences performance of such extra work.

(2) Irrespective of the method used or to be used by the Fund in determining the value of a Change Order or Field Order, the Contractor, within fifteen (15) working days after a request for the same, must submit to the Fund and the Consultant a detailed breakdown of the Contractor's estimate of the value of the omitted and/or extra work. All change and field orders must be prepared and submitted using the Fund's Open Item Log (OIL) System.

(3) Equipment Watch Rental Rate Blue Book (published online by Intertec Penton Media, Inc.) or other published rates as approved by the Fund in

writing, will be utilized for the equipment rental pricing. For the purposes of paragraph (1) hereof, the cost of equipment shall be determined, irrespective of the actual price for any rental or actual cost associated with such equipment as follows: take the monthly rate listed in Equipment Watch and dividing the same by 176 hours to establish an hourly rate and then multiplying such hourly rate by the actual number of hours that the equipment was used. The Contractor will submit an actual rental invoice, or acceptable quotation from a bonafide equipment rental supplier for rented equipment when equipment is not owned by the Contractor. The equipment rental supplier cannot be an "affiliate" of the Contractor, nor in any way be related to the Contractor. If submitted invoices/quotations are acceptable to the Fund, the Contractor will be reimbursed the actual rental cost including sales tax and appropriate mark-up. If no listing of rates for an item of equipment is contained in Equipment Watch, the Fund shall determine the reasonable rate of rental of the particular item of equipment by such other means as it finds appropriate. The edition Equipment Watch to be used shall be that in effect on the date of the receipt of bids for this Contract. None of the provisions of Equipment Watch shall be deemed referred to or included in this Contract excepting only the aforesaid monthly rates. To the cost of equipment as determined above, there is to be added the actual cost of gasoline, oil, grease and maintenance required for operation of such equipment and, in the case of equipment utilized only for extra work when, in the opinion of the Consultant, suitable equipment therefor was not available on the site, the reasonable cost of transporting said equipment to and from the site. Notwithstanding the foregoing, if the Consultant should determine that the nature or size of the equipment used by the Contractor in connection with the extra work is larger or more elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Consultant to be suitable for the extra work, the cost of equipment will not be based upon the equipment used by the Contractor but instead will be based on the smallest or least elaborate equipment determined by the Consultant to have been suitable for the performance of the extra work.

(4) Unless otherwise specifically provided for in a Change Order or Field Order, the compensation specified therein for extra work includes full payment for both the extra work covered thereby and for any damage or expense caused the Contractor by any delays to other work to be done under the Contract resulting from or on account of said extra work, and the Contractor waives all rights to any other

compensation for said extra work, damage or expense.

Section 4.03 Adjustment for Bond and Insurance Premiums

Upon final acceptance of the work to be performed under this Contract, the Fund may adjust the Contract consideration to reflect any changes in the cost of all required Bonds and liability and builder's risk insurance premiums which the Contractor had to pay for on all extra work and would have had to furnish and pay for on all omitted work. Unless such cost is agreed upon by the Fund and the Contractor, the Fund may calculate and determine the amount of the adjustment in the Contract consideration by estimating such costs. There is no markup on bond or insurance premium adjustment.

Section 4.04 Unit Prices

(1) Except as otherwise provided in the second paragraph of this Section, the unit prices, set forth on the attached Schedule "I" of this Agreement, will be binding upon both the Fund and the Contractor in determining the value of omitted and/or extra work, and, in the case of extra work, such unit prices shall be deemed to include all profit, overhead and expenses of whatsoever kind and nature of the Contractor, its subcontractors and sub-subcontractors, and the Contractor agrees that it shall make no claim for any profit, overhead, expense or percentage override in connection therewith.

(2) Where said Schedule "I" sets forth a unit price for added and/or deducted work, the Fund shall have the option, whenever it is found that the quantity of changed work varies by more than 15 percent from the quantity that is stated or that can be determined by the Contract Documents at the time of execution thereof, to accept or reject such unit price for the quantity that the changed work varies by more than 15 percent from the stated or determinable quantity. Where a quantity is not specifically stated in the Contract Documents, the Fund's determination of the amount of said quantity included in the Contract Documents shall determine the applicability of this paragraph. Where the Fund, pursuant to the foregoing provisions, exercises its aforesaid option, the amount of the increase or decrease in the Contract consideration for the quantity of work which varies by more than 15 percent from the stated or determinable quantity shall be determined in accordance with the provisions of Section 4.02 of the Agreement as if there was no unit price therefor set forth in said Schedule "I".

Section 4.05 Allowances

(1) The Contractor acknowledges that the Contract consideration includes the allowances set forth on the attached Schedule "II" and "III" of this Agreement and, except for quantitative and field order allowances, it agrees to cause the work covered thereby to be done by such contractors for such sums as the Fund may direct. Where cash allowances are provided, the allowances shall be deemed to include the purchase of the materials and/or equipment and the delivery of same to the job site. Unless otherwise specified in the Contract Documents, cash allowances do not include the proper installation of the materials and/or equipment or the connection for final utilities thereto; the cost of said installation and/or connection having been included in the amount of the Contract consideration.

(2) The Contractor acknowledges that the Contract consideration includes such sums for expenses and profit on account of cash allowances as it deems proper and that it shall make no claim for expenses or profit or any percentage override in addition thereto; said items having been included in the amount of the Contract consideration.

(3) In the event any of the cash allowances listed below are either higher or lower than the cost of having the work done in accordance herewith, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be the difference between the amount of the allowance and the actual cost of performing the work covered thereby.

(4) When quantitative allowances are provided, progress payments thereof to the Contractor will be based upon the applicable unit prices set forth on the attached Schedule "I" of the Agreement, subject, however, to the provisions of paragraph (2) of Section 4.04. In the event any of said quantitative allowances are more than or less than the actual quantity of work performed, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be determined in accordance with the provisions of Sections 4.02, 4.04 and 4.05A of the Agreement.

Section 4.05A Field Orders

When the Agreement contains a Field Order Allowance, the bid shall include the amount of such allowance. Said amount shall cover the cost of additional labor, materials and time for contingent activities within the scope of the Agreement as

directed and described by the Fund in writing in a Field Order. The Field Order will include a description of the work and the method for determining the value of such work. The value of the work directed under this allowance will be determined by one or more of the provisions of Section 4.02. If the net cost(s) of all Field Orders issued are more or less than the specified amount of the allowance, the Contract sum will be adjusted by Change Order.

Section 4.06 Deductions for Unperformed and/or Uncorrected Work

(1) Without prejudice to any other rights, remedies or claims of the Fund, in the event that the Contractor at any time fails or neglects to supply working forces and materials of the proper quantity and quality necessary, in the opinion of the Consultant or the Fund, to comply with the approved time progress schedule, or fails in any respect to prosecute the work with promptness and diligence or causes by any action or omission the stoppage or delay of or interference with the work of any other contractor having a contract with the Fund, or fails in the performance of any obligations and responsibilities under this Contract, then, and in that event, the Fund, acting itself or through the Consultant, may, upon three (3) working days' notice to the Contractor, either itself provide or have any other contractor, including but limited to the Fund's Job Order Contracting Program, provide any and all labor or materials or both necessary, in its opinion, to correct any aforesaid deficiency of the Contractor, and the Fund will thereafter backcharge the Contractor by issuing a Change Order reducing the amount of the Contract consideration for all costs and expenses it incurs in connection with the correction of such deficiency. The Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for services required in connection with the correction of such deficiency(ies).

(2) Notwithstanding any provisions in the Contract Documents to the contrary, if the Fund deems it inexpedient to correct work not done in accordance with the Contract or any work damaged as a result thereof, it shall notify the Contractor of such fact and the latter shall not remedy or correct the same. In such event, however, the amount of the Contract consideration shall be decreased by an amount, determined by the Fund, which is equal to the difference in value of the work as performed by the Contractor and the value of the work had it been

satisfactorily performed in accordance with the Contract or which is equal to the cost of performing the corrective work, whichever shall be the higher amount.

Section 4.07 Liquidated Damages

In the event that the Contractor shall fail to substantially complete all the work within the time fixed for such completion on page A-1, or within the time to which such completion may have been extended or in the event that the Contractor abandons the work and the same is not substantially completed within the aforesaid time for such completion, the Contractor must pay to the Fund as damages for each calendar day of delay in completing the work the amount set forth on page A-1. In view of the difficulty of accurately ascertaining the loss which the Fund will suffer by reason of delay in completion of the work hereunder, said sum is hereby fixed and agreed as liquidated damages which the Fund will suffer by reason of such delay and not as a penalty. The Fund may deduct and retain out of the monies which may become due hereunder to the Contractor the amount of any such liquidated damages and, in case the amount which may become due to the Contractor under the provisions of the Contract may be less than the liquidated damages suffered by the Fund, the Contractor shall pay the difference, upon demand, to the Fund.

Section 4.08 Contract Breakdown

Prior to the submission of its first application for a progress payment, the Contractor shall present to the Fund and the Consultant for their approval a detailed schedule showing the breakdown of the Contract consideration. The Contract Breakdown Summary shall be further broken down on separate Fund provided forms as required by the Consultant and the Fund. Contract Breakdown Summary and supporting forms shall be able to interface with the Fund's electronic payment system. Such schedule must contain the amount estimated for each part of the work and quantity survey for each part of the work. It shall also list the estimated value of the Contractor's guarantee obligations under the provisions of the Contract Documents, which is hereby fixed at \$5,000 or one-half of one percent (1/2%) of the Contract award amount, whichever is the lesser sum. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the Fund and the Consultant and shall not be changed after the Fund and the Consultant have approved the same. The amounts set forth in the schedule will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

Section 4.09 Prompt Payment Requirements

(1) For the purposes of Article XI-A of the State Finance Law, the Controller's Office of the State University Construction Fund, whose mailing address is The State University Plaza, 353 Broadway, Albany, New York 12246, is the Fund's designated payment office. Applications for payment must contain the approval of the Consultant before being submitted to the Fund.

(2) Whenever the Consultant's approval of an application for payment is required under the Contract, the Consultant shall have fifteen (15) calendar days, after receipt of such application, to inspect the work before acting on the application.

(3) Until such time that the Contract is approved by the Fund, the thirty (30) day period, referred to in Article XI-A of the State Finance Law for the payment of invoices without interest, shall not begin.

Section 4.10 Progress Payments

(1) Unless otherwise provided in the Contract, progress payments will be made as the work progresses upon applications submitted by the Contractor and approved by the Consultant and the Fund. Payment of such approved applications shall be made by the Fund within thirty (30) days after such approval has been given.

(2) The Fund shall make progress payments to the Contractor on the basis of such approved applications, less an amount equal to 5 percent thereof, plus an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged, , together with any back charges and offsets which are deemed necessary or likely to be incurred by the Fund as a result of any failure by the Contractor to fully, completely, accurately and timely perform its work, which it shall reserve from each such payment until all of the work covered by the Contract has been completed.

(3) When the Fund and the Consultant have determined that all the work is substantially completed, or that a substantial portion of the permanent construction has been completed and accepted, the Fund shall make a progress payment to the Contractor, on the basis of an application submitted by the Contractor and approved by the Consultant and the Fund, which shall reduce the unpaid amount due to the Contractor under the terms of the Contract, including all monies retained by the Fund from

previous progress payments to the Contractor, to an amount equal to two (2) times the cost, estimated by the Consultant, of performing, in accordance with the Contract, all uncompleted, unaccepted and corrective work, plus an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged. As the remaining items of work are satisfactorily completed or corrected, the Fund shall make progress payments to the Contractor, on the basis of applications submitted by the Contractor and approved by the Fund and the Consultant, covering said items of work less an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

Section 4.11 Applications for Progress Payments

The Contractor shall prepare all applications for progress payments for work performed, together with supporting data and computations as are deemed necessary by the Consultant to determine the accuracy of the application. The application for payment and all required supporting documentation shall be submitted using the Fund's prescribed forms and electronic payment system. The Contractor shall include with such applications reports detailing actual payments to minority and women-owned businesses who participate on Fund projects. Failure of the Contractor to submit applications for progress payments, or lack of complete and accurate supporting data, shall be sufficient reason for withholding payment until such omissions or errors are rectified. Unless otherwise directed, such applications, signed and certified as correct by the Contractor, shall be delivered by the Contractor to the Consultant once each month showing the total value of work completed and in place on the last day of the payment period covered by the application.

Section 4.12 Progress Payments for Materials Delivered to Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment to be furnished and installed under the Contract, after such materials and equipment have been delivered and accepted at the site of the work.

(2) Materials and equipment for which such progress payment has been made shall not be removed from the site, shall be stored until incorporated into the work in a location approved by the Consultant and shall be adequately protected from

fire, theft and vandalism, the effects of the elements and any other damage whatsoever, and shall at all times be available for inspection by the Consultant and the Fund.

Section 4.13 Transfer of Title to Materials Delivered to Site

Title to all supplies and materials to be furnished or provided by the Contractor to the Fund pursuant to the provisions of the Contract Documents shall immediately vest in and become the sole property of the Fund upon delivery of such supplies and materials to the site. Notwithstanding such transfer of title, the Contractor shall have the full continuing responsibility to install such materials and supplies, protect them, maintain them in proper condition and forthwith repair, replace and make good any damage thereto without cost to the Fund until such time as the work covered by the Contract is fully accepted by the Fund. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that, after title has passed to the Fund, any of such supplies and materials are rejected as being defective or otherwise unsatisfactory, title to all such supplies and materials shall be deemed to have been transferred back to the Contractor.

Section 4.14 Progress Payments for Materials Stored Off Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment which are in short and/or critical supply or have been specially fabricated for the Project. Materials and equipment, for which a progress payment is made pursuant to the preceding sentence, shall be stored by the Contractor, after fabrication, until such time as their delivery to the site is required, at a facility and location approved by the Consultant; shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever; and shall at all times be available for inspection by the Consultant and the Fund. No progress payment shall, however, be made for said materials and equipment until:

- a. The Contractor furnishes to the Fund a bill of sale listing quantity and costs of said materials and equipment f.o.b. point of origin;
- b. The Consultant shall have inspected said materials and equipment and recommended payment therefor; and

- c. The Contractor furnishes to the Fund a builder's risk insurance policy, with the broad form extended coverage endorsement, for said materials and equipment, in an amount equal to 100 percent of the value thereof, which policy shall be maintained, at the sole cost and expense of the Contractor, until said materials and equipment have been incorporated into the Project. The said insurance policy shall contain a provision that the loss, if any, is to be made adjustable with and payable to the Fund as trustee for the insured, i.e., the Fund and the Contractor, and a provision that it shall not be changed or cancelled and that it will be automatically renewed upon expiration and continued in force unless the Fund is given thirty (30) days written notice to the contrary.
- d. The Contractor shall develop and provide a preventive maintenance log for stored equipment when determined appropriate by the Consultant. The Contractor shall provide timely notification and opportunity for the Consultant and the Fund to view the Contractor's preventative maintenance efforts.

(2) Materials and equipment for which a progress payment has been made by the Fund pursuant to this Section shall be, become and remain the sole property of the Fund; provided, however, that the Contractor shall have the full continuing responsibility to install such materials and equipment, to deliver it to the site, to protect it, to maintain it in proper condition and to forthwith repair, replace and make good any damage thereto without cost and/or additional time to the Fund until such time as the work covered by the Contract is fully accepted by the Fund. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract.

Section 4.15 Withholding of Progress Payments

Notwithstanding anything contained in the Contract to the contrary, the Fund may withhold payment of all or any part of a progress, final or guarantee payment, in such an amount as it may deem proper to enforce the provisions of the Contract and to satisfy the claims of third parties, when:

- a. The Fund shall learn of any claim, of whatsoever nature or kind, against the Fund or the Contractor, which in any way arises or is alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract or out of or in connection with the Contractor's operations or performance at

or in the vicinity of the construction site, that, in the opinion of the Fund, may not be adequately covered by insurance.

If an action on such claim is timely commenced and the liability of the Fund and/or the Contractor shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the Fund shall pay such judgment or admitted claim out of the monies retained by it under the provisions of the Contract and return the balance, if any, without interest, to the Contractor.

The Fund may withhold from the Contractor any payments retained by it until such time as all such claims are either satisfied or barred by law from being presented. At such time the Fund, upon written demand by the Contractor, shall return to the Contractor the amount so withheld, without interest.

- b. The Contractor has not complied with any lawful or proper direction of the Consultant or the Fund or their representatives concerning the work covered by the Contract or the performance of the Contract or the production of records as required under the provisions of the Contract.
- c. There exists any of the conditions, listed in Section 2.26, which would allow the Fund to declare the Contractor in default of the whole or any part of the work.
- d. The Contractor is a foreign contractor and has not furnished satisfactory proof that all taxes due by such Contractor under the provisions of the Tax Law have been paid. The Certificate of the New York State Tax Commission to the effect that all such taxes have been paid shall be conclusive proof of the payment of such taxes. The term "foreign contractor" as used herein means, in the case of an individual, a person who is not a resident of the State of New York; in the case of a partnership, one having one or more partners not a resident of the State; and in the case of a corporation, one not organized under the laws of the State of New York.
- e. The Contractor, upon request of the Fund at any time after the initial progress payment by the Fund to the Contractor, fails to furnish the Fund with such documentary evidence that the Fund may deem necessary to prove to it that material and labor paid for by the Fund under previous

applications for payment submitted have been paid for by the Contractor and that there are no outstanding claims or liens in connection therewith or fails to satisfy the Fund that the Contractor, with good cause, has sufficiently provided for the payment and/or satisfaction of claims for said material and labor.

Section 4.16 Lien Law

The attention of the Contractor is specifically called to the provisions of the Lien Law of the State of New York, wherein funds received by a Contractor for a public improvement are declared to constitute trust funds in the hands of such Contractor to be applied first to the payment of certain claims.

Section 4.17 Substitution of Securities for Retainage

Any time after 50 percent of all the work has been completed, the Fund, if the progress and performance of the work is satisfactory to it, on request of the Contractor, will allow the Contractor to withdraw up to 50 percent of the aforesaid amount retained by the Fund by depositing with the Comptroller of the State of New York government securities, of the type and kind specified in Section 139 of the State Finance Law, having a market value not exceeding par, at the time of deposit, equal to the amount so withdrawn. The Comptroller of the State of New York shall, from time to time, collect all interest or income on the obligations so deposited, and shall pay the same, when and as collected, to the Contractor. If the deposit be in the form of coupon bonds, the coupons as they respectively become due shall be delivered to the Contractor; provided, however, that the Contractor shall not be entitled to interest or coupons or income on any of the deposited securities, the proceeds of which have or will be used or applied by the Fund. In the event that the Contractor does not, in accordance with the terms and provisions of the Contract, comply with and fulfill all of its obligations and responsibilities thereunder, the Comptroller of the State of New York shall have the right to sell, assign, transfer or otherwise dispose of the aforesaid securities and the Fund shall have the right to use and apply all or any part of the monies obtained by the Comptroller of the State of New York from such a sale, assignment, transfer or disposition or from the collection of interest or income from said securities to the performance and fulfillment of said obligations and responsibilities. Notwithstanding the foregoing, when the Fund makes a payment under Section 4.10 (3) of the Agreement, it will return to the Contractor, as part of such payment, its substituted securities, and thereafter all retention of

the Fund shall be in funds and not in substituted securities.

Section 4.18 Final Payment

Upon acceptance of all the work, except for the Contractor's guarantee obligations under Section 2.25 of the agreement and the Contractor's guarantee obligations under any provision of the Specifications, the Contractor shall prepare and submit to the Fund and the Consultant, for their approval, a final application for payment, which the Fund, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to 100 percent of the Contract consideration excluding the Contractor's guarantee obligations, less:

- a. All previous payments by the Fund to the Contractor;
- b. All deductions authorized to be made by the Fund under the Contract; and
- c. An amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.
- d. The Contractor shall not be entitled to any interest on the monies retained by the Fund pursuant to Subdivision c of Section 4.18 of the Agreement.

Section 4.19 Acceptance of Final Payment

(1) The acceptance by the Contractor, or by any one claiming by or through it, of the final payment shall, except with respect to the amount retained by the Fund pursuant to the provisions of subdivisions b and c of Section 4.18 of the Agreement, constitute and operate as a release to the Fund from any and all claims of any liability for anything theretofore done or furnished for or relating to or arising out of the work covered by the Contract and for any prior act, neglect or default on the part of the Fund or any of its trustees, officers, agents or employees in connection therewith.

(2) Should the Contractor refuse to accept the final payment as tendered by the Fund or should the Contractor refuse to execute the final application for payment without protest and without reserving any rights or claims against the Fund, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said final application for payment.

Section 4.20 Guarantee Payment

(1) Subject to the provisions of the second paragraph of this Section, at the expiration of one (1) year after the Fund has accepted all the work covered by the Contract, the Contractor shall prepare and submit to the Fund and the Consultant, for their approval, a guarantee application for payment, which the Fund, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to the monies retained by the Fund for the Contractor's guarantee obligations under the Agreement, less any monies deducted by the Fund under this Section. The Contractor shall not be entitled to any interest on the monies retained by the Fund pursuant to subdivision c of Section 4.18 of the Agreement.

(2) In the event the Contractor does not, in accordance with the terms and provisions of the Contract, complete all corrective work or comply with and fulfill its contractual obligations, the Fund may use and apply all or any part of the monies retained by it to have such work or obligations performed or fulfilled by a person, firm or corporation other than the Contractor. The obligations of the Contractor, under the terms and provisions of the Contract, shall not, however, be limited to the monies retained by the Fund pursuant to the provisions of the Contract.

(3) No payments may be made under this agreement for work completed more than 365 days after the completion date unless the date/duration listed on page A-1, is extended in writing by the Fund.

Section 4.21 Acceptance of Guarantee Payment

The acceptance by the Contractor or by anyone claiming by or through it, of the guarantee payment shall constitute and operate as a release to the Fund from any and all claims in connection with monies retained by the Fund. Should the Contractor refuse to accept the guarantee payment as tendered by the Fund or should the Contractor refuse to execute the guarantee application for payment without protest and without reserving any rights or claims against the Fund, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said guarantee application for payment.

Section 4.22 Contractor Limited to Money Damages

Inasmuch as the Contractor can be compensated adequately by money damages for any breach of the

Contract which may be committed by the Fund, the Contractor agrees that no default, act or omission of the Fund shall constitute a material breach of the Contract entitling it to cancel or rescind the same or to suspend or abandon performance thereof; and it hereby waives any and all rights and remedies to which it might otherwise be or become entitled to because of any wrongful act or omission of the Fund or its representatives, saving only its right to money damages.

Section 4.23 No Estoppel or Waiver

(1) The Fund shall not be precluded or estopped by any inspection, acceptance, application for payment or payment, final or otherwise, issued or made under the Contract or otherwise issued or made by it, the Consultant, or any trustee, officer, agent or employee of the Fund, from showing at any time the true amount and character of the work performed, or from showing that any such inspection, acceptance, application for payment or payment is incorrect or was improperly issued or made; and the Fund shall not be precluded or estopped, notwithstanding any such inspection, acceptance, application for payment or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on its part to comply strictly with the Contract and any monies which may be paid to it or for its account in excess of those to which it is lawfully entitled.

(2) Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefor; nor any order or application for payment issued under the Contract or otherwise issued by the Fund, the Consultant, or any trustee, officer, agent or employee of the Fund; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the Fund of any of the Contractor's duties or obligations; nor any aid lent to the Contractor by the Fund in its performance of such duties or obligations; nor any delay or omission by the Fund to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise; nor any other thing done or omitted to be done by the Fund, its trustees, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the Performance Bond or a waiver of any provision of the Contract or of any rights or remedies to which the Fund may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole

or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the Fund may be entitled because of such breach. No waiver by the Fund of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.

Section 4.24 Limitation of Actions

(1) No action or proceeding shall be maintained by the Contractor, or anyone claiming under or through the Contractor, against the Fund, or its trustees, officers, agents or employees, upon any claim arising out of or based upon the Contract or any breach thereof or by reason of any act or omission or requirement of the Fund, or its trustees, officers, agents or employees, unless:

- a. Such action or proceeding is instituted in the Supreme Court of the State of New York in and for the County of Albany;
- b. The Contractor or the person claiming under or through it shall have strictly complied with all requirements relating to the giving of notices and information with respect to such claims and shall have provided the Fund with both electronic and hard copy versions of any claims, including all required information and electronic and hard copy versions of all contractually required notices that the Contractor provided to the Fund and the Consultant throughout the duration of the Contract ;
- c. Such action or proceeding by the Contractor shall be commenced within eighteen months after the date of substantial completion set by the Fund or its Consultant and issued in writing to the Contractor. Any action or proceeding not commenced within this time frame shall be dismissed with prejudice;
- d. If the Contract is terminated or the Contractor declared in default by the Fund, such action is commenced within six (6) months after the date of such termination or declaration of default by the Fund; and
- e. All claims and disputes which are subject to or related to this Contract and the Project shall be subject to non-binding mediation, at the sole option and discretion of the Fund. Should the Fund at its sole option and in the exercise of its sole discretion elect to mediate under this clause, then a letter from the Fund indicating the completion of such mediation shall be a condition precedent to

any litigation by Contractor against the Fund or the State of New York. In the absence of the Fund exercising its right to proceed to mediation, the condition precedent to any litigation against the Fund of the State of New York, shall be a letter citing that the Fund declines its rights under this clause. The costs of any mediation shall be paid equally by the parties to the mediation.

(2) Notwithstanding anything in the laws of the State of New York to the contrary, the Contractor, or anyone claiming under or through the Contractor, shall not be entitled to any additional time to begin anew any other action if an action commenced within the times herein specified is dismissed or discontinued for any reason whatsoever.

Section 4.25 Electronic Payments

The Contractor shall provide complete and accurate payment applications in order to receive payment. Payment applications submitted must contain all information and supporting documentation required by the Fund. Payment for applications submitted by the Contractor shall only be rendered electronically unless payment by paper check is expressly authorized by the Fund's General Manager, in the General Manager's sole discretion, due to extenuating circumstances. Such electronic payment shall be made in accordance with ordinary State procedures and practices. The Contractor shall comply with the State Comptroller's procedures to authorize electronic payments. Authorization forms are available at the Office of the State Comptroller's website at www.osc.state.ny.us/epay/index.htm; by email at epunit@osc.state.ny.us; or by telephone at 518-474-4032. The Contractor acknowledges that it will not receive payment on any invoices submitted under this Contract if it does not comply with the State Comptroller's electronic payment procedures, except where the Fund's General Manager has expressly authorized payment by paper check as set forth above.

Article V Protection of Rights and Property

Section 5.01 Accidents and Accident Prevention

The Contractor shall at all times take reasonable precautions for the safety of persons engaged in the performance of the work. The Contractor shall comply fully with all applicable provisions of the laws of the State of New York and OSHA and with all valid rules and regulations thereunder. The Contractor's

attention is specifically called to the applicable rules and regulations, codes and bulletins of the New York State Department of Labor.

Section 5.02 Adjoining Property

The Contractor shall be required to protect all the adjoining property and to repair or replace any such properties damaged or destroyed by it, its employees or subcontractors through, by reason of or as a result of activities under, for or related to the Contract.

Section 5.03 Emergencies

(1) In case of an emergency which threatens loss or injury to persons or property, the Contractor will be allowed to act, without previous instructions from the Consultant or the Fund, in a diligent manner, to the extent required to avoid or limit such loss or injury, and it shall notify the Consultant and the Fund immediately thereafter of the action taken by it and of such emergency. Where the Contractor has not taken action but has notified the Consultant or the Fund of an emergency which threatens loss or injury to persons or property, it shall act in accordance with the instructions and/or authorization by the Consultant or the Fund.

(2) In the event that the Contractor performs extra work in accordance with the preceding paragraph, it will be compensated therefor in accordance with the provisions of Section 4.02.

Section 5.04 Fire Safety

(1) Contractor shall comply with the General Requirements, Section paragraph titled Temporary Fire Protection.

(2) Solid fuel salamanders and heaters shall not be used by the Contractor or any of its subcontractors. All other salamanders used by the Contractor or any of its subcontractors shall require constant attendance of competent persons on each floor where in use.

(3) All temporary fabric used by the Contractor or any of its subcontractors for curtains or awnings shall be either non-combustible or flame retarded so that it will not burn or propagate flame.

Section 5.05 Risks Assumed by Contractor

(1) To the fullest extent permitted by law, the Contractor solely assumes the following distinct several risks whether they arise from acts or omissions (whether negligent or not and whether supervisory or

otherwise) of the Contractor, of the Fund, of third persons or from any other cause, including unforeseen obstacles and difficulties which may be encountered in the prosecution of the work covered by the Contract, whether such risks are within or beyond the control of the Contractor and whether such risks involve a legal duty, primary or otherwise, imposed upon the Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York, excepting only risks which arise from defects in maps, plans, designs or Specifications prepared, acquired or used by the Consultant or the Fund, from the negligence of the Fund, its agents or employees or from affirmative acts of the Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York or their trustees, officers, agents or employees committed with intent to cause the loss, damage and injuries herein below set forth:

- a. The risk of loss or damage, direct or indirect, to the work covered by the Contract or to any plant, equipment, tools, materials or property furnished, used, installed or received by the Fund or by the Contractor or any subcontractor, material man or worker performing services or furnishing materials for the work covered hereunder. The Contractor shall bear such risk of loss or damage until the work covered by the Contract has been finally accepted by the Fund or until completion of removal of such plant, equipment, tools, materials or property from the construction site and the vicinity thereof, whichever event occurs last. In the event of such loss or damage, the Contractor shall forthwith repair, replace and/or make good any such loss or damage without cost to the Fund.
- b. The risk of claims, just or unjust, by third persons against the Contractor, the Fund, the Dormitory Authority of the State of New York, the State of New York, or the State University of New York on account of wrongful death, bodily injuries and property damage, direct or consequential, loss or damage of any kind whatsoever arising or alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract (whether actually caused by or resulting from the performance of the Contract) or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site.

(2) To the fullest extent permitted by law, the Contractor shall indemnify and save harmless the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University

of New York, their trustees, officers, agents or employees against all claims described above and for all costs and expenses incurred by them in the defense, settlement or satisfaction thereof, including attorneys' fees and court costs. If so directed, the Contractor shall at its own expense defend against such claims, in which event it shall not, without obtaining express advance permission from Counsel of the Fund, raise any defense involving in any way jurisdiction of the tribunal over the Fund, governmental nature of the Fund or the provisions of any statutes respecting suits against the Fund.

(3) Neither the Fund's final acceptance of the work to be performed hereunder nor the making of any payment shall release the Contractor from its obligations under this Section. The enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which it is responsible shall not be deemed to limit the effect of the provision of this Section or to imply that it assumes or is responsible for only risks or claims of the type enumerated.

Section 5.06 Compensation and Liability Insurance

(1) General Requirements

- a. Prior to the commencement of the work to be performed by the Contractor, the Contractor shall procure at its sole cost and expense, and maintain in force at all times during this Agreement until Final Payment and as further required by the Contract, policies of insurance as herein set forth below. All insurance shall be written by insurance carriers approved by the Fund, licensed to do business in the State of New York ("admitted" carriers), and rated at least "A-" by A.M. Best Company.
- b. Prior to the commencement of the work, the Contractor shall submit to the Fund, certificates of insurance, in a form acceptable to the Fund, showing evidence of compliance with all insurance requirements contained in this Agreement. Certificates of Insurance (with the exception of Workers' Compensation and Disability) must be provided on an ACORD 25 Certificate of Insurance, or an equivalent form. Certificates of Insurance shall disclose any deductible, self-insured retention, aggregate limit or any exclusion to the policy that materially changes the coverage required by the Contract; specify the additional insureds and named insureds as required herein; and be signed by an authorized representative of

the insurance carrier or producer. Deductibles or self-insured retentions above \$25,000 are subject to approval by the Fund and additional security may be required. Certificates shall reference the Contract number. Only original documents will be accepted.

- c. All insurance shall provide that the required coverage apply on a primary and not on an excess or contributing basis as to any other insurance that may be available to the Fund for any claim arising from the Contractor's work under this Agreement, or as a result of Contractor's activities. Any other insurance maintained by the Fund shall be in excess of and shall not contribute with the Contractor's insurance, regardless of the "other insurance" clause contained in the Fund's own policy of insurance. A copy of the endorsement reflecting this requirement may be requested by the Fund.
- d. Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the Fund with updated replacement certificates of insurance and endorsements. The Contractor shall advise the Fund of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the Fund on any letter or notification that cancels, materially changes, or non- renews the policy. If, at any time during the period of the Agreement, insurance as required is not in effect, or proof thereof is not provided to the Fund, the Fund shall have the options to (i) direct the Contractor to stop work with no additional cost or extension of time due on account thereof; or (ii) treat such failure as an event of default under Section 2.26 of the Agreement. At any time the coverage provisions and limits of the policies required herein do not meet the provisions and limits set forth in the Agreement the Contractor shall immediately cease Work on the Project. The Contractor shall not resume Work on the Project until authorized to do so by the Fund. Any delay or time lost as a result of the Contractor not having insurance required by the Agreement shall not give rise to a delay claim or any other claim against the Fund. If required by the Fund, Contractor shall deliver to the Fund within forty-five (45) days of such request, a copy of any or all policies of insurance not previously provided, certified by the insurance carrier as true and complete.
- e. Should the Contractor engage a subcontractor, the Contractor shall impose the insurance

requirements of this document on those entities, as applicable. Required insurance limits should be determined commensurate with the work of the subcontractor. Contractor shall keep the subcontractor certificates of insurance on file and produce them upon the demand of the Fund.

- f. The aggregate insurance limits set forth herein shall apply separately to each contract for which a certificate of insurance and/or policy is issued.
- g. Unless otherwise agreed to in writing by the Fund, policies must be endorsed to provide that there shall be no right of subrogation against the Fund. To the extent that any of the policies of insurance prohibit such a waiver of subrogation, Contractor shall secure the necessary permission to make this waiver.
- h. Except as otherwise specifically provided herein or agreed in writing, policies must be written on an occurrence basis. The insurance policy(ies) shall name the Fund, State University of New York, State of New York, its officers, agents, and employees as additional insureds thereunder. The additional insured requirement does not apply to Workers' Compensation or Disability coverage. Include ISO Endorsement CG 20 10 11 85 or its equivalent.

(2) Specific Coverage and Limits

The Contractor shall obtain and maintain in full force and effect, the following insurance with limits not less than those described below and as required by the terms of the Contract, or as required by law, whichever is greater:

- a. Commercial General Liability Insurance. A Commercial General Liability insurance policy with coverage that shall include, but not be limited to coverage for bodily injury, property damage, personal/advertising injury, premises liability, independent contractors, blanket contractual liability including tort liability of another assumed in Contract, liability arising from all work and operations under this Agreement, defense and indemnification obligations, including those assumed under Contract, cross liability coverage for additional insureds, products/completed operations for a term no less than three years commencing upon acceptance of the work, explosion, collapse, and underground hazards, contractor means and methods, and liability resulting from Section 240 or Section 241 of the NYS Labor Law. The limits under such policy shall not be less than: \$5,000,000 each occurrence; \$5,000,000 general aggregate; and products/completed operations with an aggregate limit of \$5,000,000.
- b. Workers Compensation and Disability Benefits as required by New York State.
- c. Comprehensive Business Automobile Liability Insurance. A policy with a combined single limit for bodily injury and property damage of no less than \$1,000,000 covering liability arising out of the use of any motor vehicle in connection with the work, including owned, leased, hired, and non-owned vehicles bearing, or, under the circumstances under which they are being used, required by the Motor Vehicle Laws of the State of New York to bear license plates. If the Contract involves the removal of hazardous waste from the project site or otherwise transporting hazardous materials, pollution liability coverage for covered autos shall be provided by form CA 99 48 03 06 or CA 00 12 03 06 and the Motor Carrier Act Endorsement (MCS90) shall be attached.
- d. Umbrella and Excess Liability. When the limits of the Commercial General Liability, Auto, and/or Employers Liability policies procured are insufficient to meet the limits specified, the Contractor shall procure and maintain Commercial Umbrella and/or Excess Liability policies with limits in excess of the primary, provided, however, that the total amount of insurance coverage is at least equal to the requirements set forth above. Such policies shall follow the same form as the primary. Any insurance maintained by the Fund or additional insured shall be considered excess of and shall not contribute with any other insurance procured or maintained by the Contractor including primary, umbrella and excess liability regardless of the "other insurance" clause contained in either party's policy.
- e. Owner's Protective Liability Insurance. A policy issued to and covering the liability for damages imposed by law upon the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, with respect to all operations under the Contract by the Contractor and its subcontractors, and/or their interest in the Project and the property upon which work under the Contract is to be performed, including omissions and supervisory acts of the former. Said insurance policy limits shall be no

less than \$1,000,000 each occurrence and \$2,000,000 general aggregate.

- f. **Asbestos Abatement Insurance.** A liability insurance policy issued to and covering the liability, of the Contractor and/or subcontractor engaged in the removal, handling or wrapping of asbestos, if any of such work is to be performed under the Contract, for bodily injury, illness, sickness or property damage caused by exposure to asbestos in an amount not less than \$1,000,000 per occurrence and \$2,000,000 aggregate. The Contractor and/or its aforesaid subcontractor shall either obtain an endorsement to the aforesaid required insurance policy adding the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, as additional parties insured thereunder or shall obtain a separate owner's protective liability insurance policy for such parties with coverage similar to that required by the first sentence of this subdivision. In addition, any Contractor or subcontractor engaged in the removal, handling, or wrapping of asbestos shall, to the fullest extent permitted by law, hold harmless and indemnify the Fund, the Dormitory Authority of the State of New York the State of New York and the State University of New York, their trustees, officers, agents or employees, for any claims or liabilities in connection with illness or sickness arising from work performed, not performed, or which should have been performed. The Contractor shall have said hold-harmless and indemnification conditions stipulated in all Contracts with subcontractors.

Section 5.07 Builder's Risk

(1) The Contractor shall procure and maintain, at its own cost and expense, until final acceptance of all work covered by this Contract or until the Project has been turned over for use by the State University of New York, whichever event occurs earlier, a builder's risk insurance policy covering all risks, with fire, extended coverage, vandalism and malicious mischief coverage. In the event the loss occurs at an occupied facility, the policy shall permit occupancy without the consent of the insurance company. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by operation of any law, ordinance, or regulation, and property of the State held in their care, custody and/or control.

(2) The policy shall be in an amount equal to the Project's insurable value, i.e., the Contract consideration less the cost of the Contractor's

Performance and Labor and Material Bonds; the cost of trees, shrubbery, lawn grass, plants and the maintenance of the same; the cost of demolition; the cost of excavation; the cost of foundations, piers or other supports which are below the undersurface of the lowest basement floor, or where there is no basement, which are below the surface of the ground, concrete and masonry work; the cost of underground flues, pipes or wiring; the cost of earthmoving, grading and the cost of paving, roads, walks, parking lots or athletic fields; and the cost of bridges, tunnels, dams, piers, wharves, docks, retaining walls and radio and/or television towers and antennas.

(3) The policy may contain a provision for a \$500 deductible for each loss to a Project having an insurable value of less than \$1,500,000 and a \$1,000 deductible for each loss to a Project having an insurable value of \$1,500,000 or more.

(4) The Fund, the Contractor and its subcontractors, as their interests may appear, shall be named as the parties insured under said policy.

(5) The Contractor shall have the sole responsibility to promptly report any loss to the insurer and/or its representatives and to furnish the latter with all necessary details relating to the occurrence of the loss and the amount thereof. The Fund, the Contractor and all subcontractors of the Contractor waive all rights, each against the others, for damages caused by fire or other perils covered by insurance provided under the terms of this Section, except such rights as they may have to the proceeds of insurance received; provided, however, this waiver shall not apply to any manufacturer, supplier or similar agent under any guarantee or warranty.

(6) The Contractor shall not violate or permit to be violated any condition of such policy and shall at all times satisfy the fire safety requirements of the Fund and the insurance company issuing the same.

(7) The procurement and maintenance of said policy shall in no way be construed or be deemed to relieve the Contractor from any of the obligations and risks imposed upon it by this Contract or to be a limitation on the nature or extent of such obligations and risks.

(8) Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the Fund with an updated replacement certificate of insurance and endorsements. The Contractor shall advise the Fund of any letter or notification that cancels, materially changes, or non- renews the policy

and Contractor shall require the insurance carrier(s) to copy the Fund on any letter or notification that cancels, materially changes, or non- renews the policy. Before the Contractor shall be entitled to have any progress payment rendered on account of the work which is to be insured pursuant to this Section, it shall furnish to the Fund a certificate in duplicate of the insurance herein required. Such insurance must be procured from an insurance carrier approved by the Fund, licensed to do business in the State of New York ("admitted" carrier), and rated at least "A-" by A.M. Best Company.

Section 5.08 Effect of Procurement of Insurance

Neither the procurement nor the maintenance of such insurance shall in any way affect or limit the obligations, responsibilities or liabilities of the Contractor hereunder.

Section 5.09 No Third Party Rights

Nothing in this Section or in this Agreement shall create or give to third parties, except the Dormitory Authority of the State of New York, the State of New York and the State University of New York any claim or right of action against the Contractor, the Consultant, the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York beyond such as may legally exist irrespective of this Section or this Agreement.

Article VI Minority and Women's Business Enterprises (MWBEs) / Equal Employment Opportunity (EEO) Provisions

Section 6.01 Definitions

The terms "Minority-owned business enterprise" ("MBE"), "Women-owned business enterprise" ("WBE") or "minority group member", and "Subcontract" shall have the same meaning as under Article 15-A of the New York State Executive Law, and 5 NYCRR Parts 140 – 145, as the same may be from time to time amended.

Section 6.02 MWBE/EEO Policy Statement

(1) The Fund recognizes the need to take affirmative action to promote the employment of minority group members and women and to ensure that Minority and Women Business Enterprises are

given the opportunity to participate in the performance of its construction program. This opportunity for participation in our free enterprise system by socially and economically disadvantaged persons is essential to obtain social and economic equality and improve the functioning of the State economy. Accordingly, it is the policy of the Fund to provide for participation of minorities and women on the Project.

(2) The Contractor acknowledges its understanding of the policy herein stated and agrees to cooperate with the Fund in the implementation of this policy.

Section 6.03 Participation by Minority and Women's Business Enterprises (MWBEs)/ Equal Employment Opportunity (EEO)

(1) General Provisions

- a. The Fund is required to implement the provisions of New York State Executive Law Article 15-A, 5 NYCRR Parts 140-145 of the New York Codes, Rules and Regulations ("NYCRR"), and Executive Order No. 162 dated January 9, 2017 ("E.O. 162") for all State contracts as defined therein, with a value (1) in excess of \$25,000 for labor, services, equipment, materials, or any combination of the foregoing or (2) in excess of \$100,000 for real property renovation and/or construction.
- b. The Contractor agrees, in addition to any other nondiscrimination provision of the Contract and at no additional cost to the Fund, to fully comply and cooperate with the Fund in the implementation of New York State Executive Law Article 15-A, the regulations promulgated thereunder, and E.O. 162. These requirements include equal employment opportunities for minority group members and women ("EEO") and contracting opportunities for New York State certified minority and women-owned business enterprises ("MWBEs"). Contractor's demonstration of "good faith efforts" pursuant to 5 NYCRR §142.8 shall be a part of these requirements. These provisions shall be deemed supplementary to, and not in lieu of, the nondiscrimination provisions required by New York State Executive Law Article 15 (the "Human Rights Law") and other applicable federal, state or local laws.

c. Failure to comply with all of the requirements herein may result in a finding of non-responsiveness, non-responsibility and/or a breach of contract, leading to the assessment of liquidated damages pursuant to Section 7 of this Article, withholding of funds and such other remedies as may be available to the Fund pursuant to the Contract and applicable law, including but not limited to bid rejection or contract termination for cause.

d. Contractor will include the provisions of this Article in each and every agreement, contract, and/or subcontract with each and every subcontractor and supplier in such a manner that the provisions of this Article will be binding upon each subcontractor and supplier as to work in connection with and related to this Agreement. All subcontractors and suppliers must be approved by the Fund and the MWBE Utilization plans are subject to approval by the Fund's Opportunities Program.

(2) Contract Goals

a. For purposes of this Contract, the Fund hereby establishes goals of ___% for New York State-certified Minority-Owned Business Enterprises ("MBE") participation and ___% for New York State-certified Women-Owned Business Enterprises ("WBE") participation (collectively "MWBE Contract Goals") based on the current availability of MBEs and WBEs.

i. The ___% goal for Minority-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from MBEs.

ii. The ___% goal for Women-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from WBEs.

b. For purposes of providing meaningful participation by MWBEs on the Contract and achieving the MWBE Contract Goals established in Section 2a hereof, Contractor should reference the Directory of New York State Certified MWBEs found at the following

internet address:
<https://www.ny.newnycontracts.com>.

Additionally, the Contractor is encouraged to contact the Fund's Opportunities Program Office. The Contractor can also reach out to the Division of Minority and Women's Business Development at (212) 803-2414 to discuss additional methods of maximizing participation by MWBEs on the Contract.

c. The Contractor understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR §140.1, may be applied towards the achievement of the applicable MWBE participation goal. The portion of a contract with an MWBE serving as a supplier, that shall be deemed to represent the commercially useful function performed by the MWBE, shall be 60 percent of the total value of the contract. The portion of a contract with an MWBE serving as a broker, that shall be deemed to represent the commercially useful function performed by the MWBE, shall be the monetary value for fees, or the markup percentage, charged by the MWBE.

d. Where MWBE Contract Goals have been established herein, the Contractor must document "good faith efforts" pursuant to 5 NYCRR §142.8, to provide meaningful participation by MWBE's as subcontractors and suppliers, in the performance of the Contract. Such documentation shall include, but not necessarily be limited to:

- i. Evidence of outreach to MWBEs,
- ii. Any responses from MWBE's to the Contractor's outreach;
- iii. Copies of advertisements for participation by MWBEs in appropriate general circulation, trade and minority or women-owned publications;
- iv. The dates of attendance at any pre-bid, pre-award or other meetings, if any, scheduled by the Fund with MWBE's; and,
- v. Information describing specific steps undertaken by the Contractor to reasonably structure the Contract Scope of work to maximize opportunities for

MWBE participation.

(3) Equal Employment Opportunity (EEO)

- a. The provisions of Article 15-A of the Executive Law, the rules and regulations promulgated thereunder, and E.O. 162 pertaining to equal employment opportunities for minority group members and women, shall apply to the Contract. Contractor agrees to be bound by them. In the event of any conflict, the provisions of the statute, regulations and Executive Order shall govern over any contrary provisions of this Agreement.
- b. In performing the Contract, the Contractor shall:
 - i. Ensure that the Contractor and each contractor and subcontractor performing work on the Contract shall undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, EEO shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.
 - ii. Within seven (7) calendar days after the opening of bids or upon receipt of a request by the Fund, the Contractor shall have submitted an EEO policy statement to the Fund.
 - iii. If the Contractor or any of its subcontractors do not have an existing EEO policy statement, the Fund may require the Contractor or subcontractor to adopt a model statement.
 - iv. The Contractor's EEO policy statement shall include the following language:
 - (a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability or marital status, will undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without

discrimination, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force.

(b) The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the Contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

(c) At the request of the Fund, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(d) The Contractor will include the provisions of paragraphs a through c of this subdivision (iv) and paragraph e of this subsection 3 which provides for relevant provisions of the Human Rights Law, in every subcontract in such a manner that the requirements of the subdivision will be binding upon each subcontractor as to work in connection with the Contract.

c. Staffing Plan

To ensure compliance with E.O.162, in connection with all low bids in excess of \$250,000, the Contractor shall, as a required condition of contract award, prepare and submit a staffing plan, as part of the Contractor's bid or proposal, or within a reasonable time after the bid opening or proposal submission and prior to final contract award, as directed by the Fund. The Contractor shall do so using the staffing plan form provided by the Fund, to document the composition of the proposed workforce to be utilized in the performance of the Contract by the specified categories listed, including ethnic background, gender, and Federal occupational categories.

d. Monthly Workforce Utilization/Gross Wages Report

i. For each and every real property renovation and/or construction contract in excess of \$100,000, the Contractor shall, during the term of the Contract and as part of the normal course of performing the work of the Contract, submit a monthly Workforce Utilization/Gross Wages Report, and shall require each of its subcontractors to submit a Workforce Utilization/Gross Wages Report in the electronic form prescribed by the Fund on a monthly basis.

ii. Separate forms shall be completed by the Contractor and any subcontractors.

iii. Pursuant to E.O.162, in addition to required Equal Employment Opportunity (EEO) information, the Contractor and its subcontractors are also required to include in such monthly reports the job titles and gross wages paid to each of their employees for the work performed by such employees on the Contract; or for each and every member of their entire workforce, if they are unable to determine which employees are working directly on the contract for which the report is submitted.

e. Contractor shall comply with the provisions of the Human Rights Law, all other State and Federal statutory and constitutional non-discrimination provisions. Contractor and sub-contractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

(4) MWBE Utilization Plan

a. The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan for the Fund's approval prior to the execution of the Contract and within seven (7) calendar days after receipt of a request thereof.

b. Contractor agrees to adhere to such MWBE Utilization Plan in the performance of the Contract.

c. Contractor further agrees that a failure to submit and/or adhere to such MWBE Utilization Plan may constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, the Fund shall be entitled to any remedy provided herein, including but not limited to, a finding that the Contractor is non-responsive

(5) Waivers

If the Contractor, after making good faith efforts, is unable to achieve the MWBE Contract Goals stated herein, the Contractor may submit a request for a waiver through a method provided by the Fund. Such waiver request must be supported by evidence of the Contractor's good faith efforts to achieve the maximum feasible MWBE participation towards the applicable MWBE Contract Goals. If documentation included with the waiver request is completed, the Fund shall evaluate the request and issue a written notice of approval or denial within twenty (20) business days of receipt.

If the Fund, upon review of the MWBE Utilization Plan, the reports described in Section 6.04, or any other relevant information, determines that the Contractor is failing or refusing to comply with the MWBE Contract Goals, and no waiver has been issued in regards to such non-compliance, the Fund may issue a notice of deficiency to the Contractor. The Contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE Contract Goals.

(6) Liquidated Damages

a. Where the Fund determines that Contractor is not in compliance with the provisions of this Article and the Contractor refuses to comply with such requirements, or if the Contractor is found to have willfully and intentionally failed to comply with the MWBE Contract Goals, Contractor shall be obligated to pay liquidated damages to the Fund.

b. Such liquidated damages shall be calculated as an amount equaling the difference between:

- i. All sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and
- ii. All sums actually paid to MWBEs for work performed or materials supplied under the Contract.
- c. In the event a determination has been made which requires the payment of liquidated damages and such identified sums have not been withheld by the Fund, Contractor shall pay such liquidated damages to the Fund within sixty (60) days after they are assessed. Provided, however, that if the Contractor has filed a complaint with the Director of the Division of Minority and Woman Business Development pursuant to 5 NYCRR § 142.12, liquidated damages shall be payable only in the event of a determination adverse to the Contractor following the complaint process.

Section 6.04 Reports, Records and Documentation

- a. The Contractor shall, for each and every real property renovation and/or construction contract in excess of \$100,000, file with the Fund monthly reports in the electronic form prescribed by the Fund, regarding actions taken pursuant to this Article, as well as a list of and value of subcontracts and supply contracts.
- b. The Contractor shall permit access to its books, records and accounts by the Fund for purposes of investigation to ascertain compliance with the provisions of this Article. The Contractor shall include this provision in every subcontract so that such provision will be binding upon each subcontractor.
- c. Failure to comply with the foregoing requirements entitles the Fund to take such action as the withholding of funds, suspension or termination of the Contract or such other actions or enforcement proceedings as allowed by the Contract. Such failure may also result in a finding of non-responsiveness, non-responsibility and/or a breach of the Contract.

Article VII Provisions Required by Law

Section 7.01 Provisions Deemed Inserted

Each and every provision required by law to be inserted in the Contract, including, but not limited to, the applicable provisions set forth in Schedule "A" which is attached hereto and made a part hereof, shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Contract shall forthwith be physically amended to make such insertion or correction.

Section 7.02 Wage Rates

The Contractor shall post the appropriate prevailing wage schedules in a conspicuous place at the construction site. The Department of Labor shall provide the Contractor with posters relating to prevailing wage rates and same shall be displayed by the Contractor in a conspicuous place at the construction site. The Contractor shall also distribute wallet cards, to be provided by the Department of Labor, to all workers engaged at the construction site containing information relating to wage rates and telephone numbers to call if a worker believes his or her rights are being violated. The Contractor shall provide each worker with a written notice, informing them of the applicable prevailing wage requirements, and the Contractor must obtain a signed statement or declaration from such worker attesting to the fact that he or she has been given this information. Further, the Contractor is required to keep certified copies of its payrolls at the construction site.

Section 7.03 Iran Energy Sector Divestment

Pursuant to New York State Finance Law §165-a, Iran Divestment Act of 2012 (Act), the Office of General Services is required to post on its website a list of persons who have been determined to engage in investment activities in Iran ("prohibited entities list"), as defined by the Act. New York State Public Authorities Law § 2879-c, with certain exceptions, prohibits the Fund from entering into or awarding a Contract with persons identified on the prohibited entities list and requires that the person (as defined in paragraph (e) of subdivision one of Section 165-a of the State finance law) entering into the contract with the Fund certify, under penalty of perjury, that it is not on the prohibited entities list. By signing this Agreement with the Fund, each person (as defined in

paragraph (e) of subdivision one of Section 165-a of the State finance law) and each person signing on behalf of any other party certifies, and in the case of a joint bid or partnership each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each person is not on the prohibited entities list.

Article VIII Vendor Responsibility

(1) The Contractor shall at all times during the Agreement term remain responsible. The Contractor shall provide the Fund with written notice as required by this Article of any issues impacting its responsibility, which shall minimally include updated responses to the its filed vendor responsibility questionnaire. The Contractor agrees, if requested by the Fund, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance and organizational and financial capacity.

(2) The Fund, at its sole discretion, reserves the right to suspend any or all activities under this Agreement, at any time, when the Fund discovers information that calls into question the responsibility of the Contractor. In the event of such suspension, the Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, the Contractor must comply with the terms of the suspension order. Agreement activity may resume at such time as the Fund issues a written notice authorizing a resumption of performance under the Agreement.

(3) Upon written notice to the Contractor, and a reasonable opportunity to be heard with appropriate Fund officials or staff, the Contractor may be terminated by the Fund at the Contractor's expense where the Contractor is determined by the Fund to be non-responsible. In such event, the Fund may complete the contractual requirements in any manner that the Fund may deem advisable and pursue available legal or equitable remedies for breach.

(4) In addition to the notice requirements set forth in Section 1.12 of this Agreement, the Contractor shall provide the notice required by this section as follows:

The State University Construction Fund

Attention: Corporate Integrity Officer

Address: 353 Broadway, Albany, NY 12246

Telephone Number: (518) 320-1746

E-mail address: JoAnne.DiStefano@suny.edu

In no case shall termination of the Contract by the Fund be deemed a breach by the Fund thereof, nor shall the Fund be liable for any damages or lost profits or otherwise, which may be sustained by Contractor as a result of such termination.

Article IX Use of Service-Disabled Veteran-Owned Business Enterprises in Contract Performance

(1) Article 17-B of New York State Executive Law acknowledges that Service-Disabled Veteran-Owned Businesses (SDVOBs) strongly contribute to the economies of the State and the nation. As defenders of our nation and in recognition of their economic activity in doing business in New York State, the Contractor for the Project and Work defined in this Agreement, agrees to, at no additional cost to the Fund, fully comply and cooperate with the Fund's implementation of New York State Executive Law Article 17-B and provide opportunities for SDVOBs in the fulfillment of the requirements of this Agreement. SDVOBs can be readily identified on the directory of certified businesses at:

<https://ogs.ny.gov/Veterans/#1>

(2) The Contractor is strongly encouraged to the maximum extent practical and consistent with legal requirements of the State Finance Law and the Executive Law to use responsible and responsive SDVOBs in purchasing and utilizing commodities, services and technology that are of equal quality and functionality to those that may be obtained from non-SDVOBs. Furthermore, Contractors are reminded that they must continue to utilize small, minority and women-owned businesses consistent with current State law

(3) Utilizing SDVOBs in State contracts will help create more private sector jobs, rebuild New York State's infrastructure, and maximize economic activity to the mutual benefit of the Contractor and its SDVOB partners. SDVOBs will promote the Contractor's optimal performance under the Agreement, thereby fully benefiting the public sector programs that are supported by associated public procurements.

(4) Public procurements can drive and improve the State's economic engine through promotion of the use of SDVOBs by the Manager. The Fund, therefore, expects Contractors to provide maximum assistance to SDVOBs in the performance of services for this Agreement. The potential participation by all kinds of SDVOBs will deliver great value to the State and its taxpayers.

(5) For the purposes of this Agreement, the Fund hereby establishes the goal of «SDVOB_goal»% participation for SDVOBs. For the purposes of providing meaningful participation by SDVOBs on the Agreement and achieving the Agreement Goal, the Contractor should reference the directory of New York State Certified SDVOBs at the following internet address:

<https://ogs.ny.gov/Veterans/#1>

(6) Damages – SDVOB Participation: Any Contractor who willfully and intentionally fails to comply with the SDVOB participation requirements of the SDVOB regulations set forth in 9 NYCRR Section 252, and as set forth in this Agreement, shall be liable to the Fund for damages as otherwise specified in this agreement, and shall provide for other appropriate remedies on account of such breach. Damages shall be calculated based on the actual cost incurred by the Fund related to the Fund's expenses for personnel, supplies and overhead related to establishing, monitoring and reviewing certified SDVOB enterprise programmatic goals.

(7) The Contractor is required to submit a Compliance Report to the Fund in every application for payment or by request of the Fund and such report must document the progress made towards achievement of the SDVOB goal of the Agreement.

Article X Requirement for Office of State Comptroller Review

In accordance with the Memorandum of Understanding (MOU) dated as of August 15, 2019 by and between the Governor, the Office of State Comptroller (State Comptroller), the Fund and other entities, it was agreed that certain Fund contracts (Covered Contracts) are subject to review by the State Comptroller.

As such a Covered Contract, the State shall have no liability under this Agreement and this Agreement is not valid, effective or binding until it has been approved by the State Comptroller and filed in his or her office; provided however that if the State Comptroller does not approve or reject this Agreement within the time period specified in the MOU, then this Agreement shall be valid and enforceable without such approval.

IN WITNESS WHEREOF, the parties hereto have
executed this Agreement as of the day and year first
above written.

STATE UNIVERSITY CONSTRUCTION FUND

By _____
General Manager
Robert M. Haelen

By _____

Date: _____

If Corporation, affix Corporate Seal

SUCF Project No.

Contract No.

ACKNOWLEDGMENTS

(ACKNOWLEDGMENT BY INDIVIDUAL)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came

_____, to me known and known to me to be the
person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

Notary Public

(ACKNOWLEDGMENT BY PARTNERSHIP)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came

_____, to me known and known to me to be the
person who executed the above instrument, who, being duly sworn by me, did for himself depose and say that he is a
member of the firm of _____ consisting of himself and

that he executed the foregoing instrument in the firm name of _____

and that he had authority to sign same, and he did duly acknowledge to me that he executed the same as the act and
deed

of said firm of _____, for the uses and purposes mentioned therein.

Notary Public

(ACKNOWLEDGEMENT BY CORPORATION)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came

_____, to me known, who, being by me duly sworn, did depose

and say that he/she/they reside(s) in _____; that he/she/they is (are) the

_____ (president or other officer or director or attorney in fact duly appointed) of the

_____ (name of corporation), the corporation described in and which executed

the above instrument; and that he/she/they signed his/her/their name(s) thereto by authority of the board of directors of said
corporation.

Notary Public

Appendix “A”

Standard Clauses For New York State Contracts

The parties to the attached contract, license, lease, amendment or other agreement of any kind (hereinafter, "the contract" or "this contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party other than the State, whether a contractor, licensor, licensee, lessor, lessee or any other party; the word "State" herein refers to the State of New York and/or the State University Construction Fund "Fund"):

1. EXECUTORY CLAUSE. In accordance with Section 41 of the State Finance Law, the State shall have no liability under this contract to the Contractor or to anyone else beyond funds appropriated and available for this contract.

2. NON-ASSIGNMENT CLAUSE. In accordance with Section 138 of the State Finance Law, this contract may not be assigned by the Contractor or its right, title or interest therein assigned, transferred, conveyed, sublet or otherwise disposed of without the State's previous written consent, and attempts to do so are null and void. Notwithstanding the foregoing, such prior written consent of an assignment of a contract let pursuant to Article XI of the State Finance Law may be waived at the discretion of the Fund and with the concurrence of the State Comptroller where the original contract was subject to the State Comptroller's approval, where the assignment is due to a reorganization, merger or consolidation of the Contractor's business entity or enterprise. The State retains its right to approve an assignment and to require that any Contractor demonstrate its responsibility to do business with the State. The Contractor may, however, assign its right to receive payments without the State's prior written consent unless this contract concerns Certificates of Participation pursuant to Article 5-A of the State Finance Law.

3. COMPTROLLER'S APPROVAL. In accordance with the Memorandum of Understanding dated as of August 15, 2019 by and between the Governor, the Office of State Comptroller ("State Comptroller"), the Fund and other entities, providing for State Comptroller review of certain contracts, any such covered contracts shall not be valid, effective or binding upon the State until either such contract has been approved by the State Comptroller or the allowed time period has passed without State Comptroller approval or rejection and such contracts are filed in his or her office.

4. WORKERS' COMPENSATION BENEFITS. In accordance with Section 142 of the State Finance Law, this contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

5. NON-DISCRIMINATION REQUIREMENTS. To the extent required by Article 15 of the Executive Law (also known as the Human Rights Law) and all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment, nor subject any individual to harassment, because of age, race, creed, color, national origin, sexual orientation, gender identity or expression, military status, sex, disability, predisposing genetic characteristics, familial status, marital status, or domestic violence victim status or because the individual has opposed any practices forbidden under the Human Rights Law or has filed a complaint, testified, or assisted in any proceeding under the Human Rights Law. Furthermore, in accordance with Section 220-e of the Labor Law, if this is a contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 thereof, Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. Contractor is subject to fines of \$50.00 per person per day for any violation of Section 220-e or Section 239 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation.

6. WAGE AND HOURS PROVISIONS. If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 thereof, neither Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the Labor Law and as set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law. Additionally, effective April 28, 2008, if this is a public work contract covered by Article 8 of the Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with Subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to payment by the State of any State approved sums due and owing for work done upon the project.

7. NON-COLLUSIVE BIDDING CERTIFICATION. In accordance with Section 139-d of the State Finance Law, if this contract was awarded based upon the submission of bids, Contractor affirms, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. Contractor further affirms that, at the time Contractor submitted its bid, an authorized and responsible person executed and delivered to the State a non-collusive bidding certification on Contractor's behalf.

8. INTERNATIONAL BOYCOTT PROHIBITION. In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds \$5,000, the Contractor agrees, as a material condition of the contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 et seq.) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the State Comptroller within five (5) business days of such conviction, determination or disposition of appeal (2 NYCRR § 105.4).

9. SET-OFF RIGHTS. The State and the Fund shall have rights of set-off. These rights shall include, but not be limited to, the option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing to the State or the Fund with regard to this contract or any other Fund contract, as well as any other contract with any State department or agency, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the State or the Fund for any other reason including, without limitation, tax delinquencies, fee delinquencies or monetary penalties, adjustments, fees or claims for damages. The State and the Fund shall exercise its set-off rights in accordance with normal State practices including, in cases of set-off pursuant to an audit, the finalization of such audit by the State, the Fund its representatives, or the State Comptroller.

10. RECORDS. The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (hereinafter, collectively, the "Records"). The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter. The State Comptroller, the Attorney General and any other person or entity authorized to conduct an examination, as well as the Fund, shall have access to the Records during normal business hours at an office of the Contractor within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. The State shall take reasonable steps to protect from public disclosure any of the Records which are exempt from disclosure under Section 87 of the Public Officers Law (the "Statute") provided that: (i) the Contractor shall timely inform an appropriate State official, in writing, that said records should not be disclosed; and (ii) said records shall be sufficiently identified; and (iii) designation of said records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, the State's or the Fund's right to discovery in any pending or future litigation.

11. IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION. (a) Identification Number(s). Every invoice or New York State Claim for Payment submitted to the Fund by a payee, for payment for the sale of goods or services or for transactions (e.g., leases, easements, licenses, etc.) related to real or personal property must include the payee's identification number. The number is any or all of the

following: (i) the payee's Federal employer identification number, (ii) the payee's Federal social security number, and/or (iii) the payee's Vendor Identification Number assigned by the Statewide Financial System. Failure to include such number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or Claim for Payment, must give the reason or reasons why the payee does not have such number or numbers.

(b) Privacy Notification. (1) The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in Section 5 of the State Tax Law. Disclosure of this information by the seller or lessor to the State is mandatory. The principal purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their tax liabilities and to generally identify persons affected by the taxes administered by the Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law. (2) The personal information is requested by the Fund to purchase the goods or services or lease the real or personal property covered by this contract or lease. The information is maintained in the Statewide Financial System by the Vendor Management Unit within the Bureau of State Expenditures, Office of the State Comptroller, 110 State Street, Albany, New York 12236.

12. EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN. In accordance with Section 312 of the Executive Law and 5 NYCRR Part 143, if this contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of \$25,000.00, whereby a contracting agency is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the Fund; or (ii) a written agreement in excess of \$100,000.00 whereby the Fund is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of \$100,000.00 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project, then the following shall apply and by signing

this agreement the Contractor certifies and affirms that it is Contractor's equal employment opportunity policy that:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on State contracts and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. Affirmative action shall mean recruitment, employment, job assignment, promotion, upgradings, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation;

(b) at the request of the Fund, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein; and

(c) the Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the State contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

Contractor will include the provisions of "a," "b," and "c" above, in every subcontract over \$25,000.00 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State. The State shall consider compliance by a contractor or subcontractor with the requirements of any federal law concerning equal employment opportunity which effectuates the purpose of this clause. The Fund shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such federal law and if such duplication or conflict exists, the Fund shall waive the applicability of Section 312 to the extent of such duplication or conflict.

Contractor will comply with all duly promulgated and lawful rules and regulations of the Department of Economic Development's Division of Minority and Women's Business Development pertaining hereto.

13. CONFLICTING TERMS. In the event of a conflict between the terms of the contract (including any and all attachments thereto and amendments thereof) and the terms of this Schedule A, the terms of this Schedule A shall control.

14. GOVERNING LAW. This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

15. LATE PAYMENT. Timeliness of payment and any interest to be paid to Contractor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law. For the purposes of Article 11-A of the State Finance law, the Controller's Office of the State University Construction Fund, whose mailing address is the State University Plaza, 353 Broadway, Albany, New York 12246, is the Fund's designated payment office.

16. NO ARBITRATION. Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized), but must, instead, be heard in a court of competent jurisdiction of the State of New York.

17. SERVICE OF PROCESS. In addition to the methods of service allowed by the State Civil Practice Law & Rules ("CPLR"), Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Contractor's actual receipt of process or upon the Fund's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Contractor must promptly notify the Fund, in writing, of each and every change of address to which service of process can be made. Service by the Fund to the last known address shall be sufficient. Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

18. PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS. The Contractor certifies and warrants that all wood products to be used under this contract award will be in accordance with, but not limited to, the specifications and provisions of Section 165 of the State Finance Law, (Use of Tropical Hardwoods) which prohibits purchase and use of tropical hardwoods, unless specifically exempted, by

the State or any governmental agency or political subdivision or public benefit corporation. Qualification for an exemption under this law will be the responsibility of the contractor to establish to meet with the approval of the State.

In addition, when any portion of this contract involving the use of woods, whether supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in § 165 State Finance Law. Any such use must meet with the approval of the State; otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the State.

19. MACBRIDE FAIR EMPLOYMENT PRINCIPLES. In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992), the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in Section 165 of the New York State Finance Law), and shall permit independent monitoring of compliance with such principles.

20. OMNIBUS PROCUREMENT ACT OF 1992. It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority- and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business
Albany, New York 12245
Telephone: 518-292-5100
Fax: 518-292-5884
email: opa@esd.ny.gov

A directory of certified minority- and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business Development

633 Third Avenue
New York, NY 10017
212-803-2414
email: mwbecertification@esd.ny.gov
<https://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp>

The Omnibus Procurement Act of 1992 (Chapter 844 of the Laws of 1992, codified in State Finance Law § 139-i and Public Authorities Law § 2879(3)(n)-(p)) requires that by signing this bid proposal or contract, as applicable, Contractors certify that whenever the total bid amount is greater than \$1 million:

(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority- and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to the State;

(b) The Contractor has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the State upon request; and

(d) The Contractor acknowledges notice that the State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

21. RECIPROCITY AND SANCTIONS PROVISIONS. Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act 1994 and 2000 amendments (Chapter 684 and Chapter 383, respectively, codified in State Finance Law § 165(6) and Public Authorities Law § 2879(5))) require that they be denied contracts which they would otherwise obtain. NOTE: As of October 2019, the list of discriminatory jurisdictions subject to this provision

includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii.

22. COMPLIANCE WITH BREACH NOTIFICATION AND DATA SECURITY LAWS. Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law § 899-aa and State Technology Law § 208) and commencing March 21, 2020 shall also comply with General Business Law § 899-bb.

23. COMPLIANCE WITH CONSULTANT DISCLOSURE LAW. If this is a contract for consulting services, defined for purposes of this requirement to include analysis, evaluation, research, training, data processing, computer programming, engineering, environmental, health, and mental health services, accounting, auditing, paralegal, legal or similar services, then, in accordance with Section 163 (4)(g) of the State Finance Law (as amended by Chapter 10 of the Laws of 2006), the Contractor shall timely, accurately and properly comply with the requirement to submit an annual employment report for the contract to the Fund, the Department of Civil Service and the State Comptroller.

24. PROCUREMENT LOBBYING. To the extent this agreement is a "procurement contract" as defined by State Finance Law §§ 139-j and 139-k, by signing this agreement the contractor certifies and affirms that all disclosures made in accordance with State Finance Law §§ 139-j and 139-k are complete, true and accurate. In the event such certification is found to be intentionally false or intentionally incomplete, the Fund may terminate the agreement by providing written notification to the Contractor in accordance with the terms of the agreement.

25. CERTIFICATION OF REGISTRATION TO COLLECT SALES AND COMPENSATING USE TAX BY CERTAIN STATE CONTRACTORS, AFFILIATES AND SUBCONTRACTORS.

To the extent this agreement is a contract as defined by Tax Law § 5-a, if the contractor fails to make the certification required by Tax Law § 5-a or if during the term of the contract, the Department of Taxation and Finance or the covered agency, as defined by Tax Law § 5-a, discovers that the certification, made under penalty of perjury, is false, then such failure to file or false certification shall be a material breach of this contract and this contract may be terminated, by providing written notification to the Contractor in accordance with the terms of the agreement, if the covered agency determines that such action is in the best interest of the State.

26. IRAN DIVESTMENT ACT. By entering into this Agreement, Contractor certifies in accordance with State Finance Law § 165-a that it is not on the "Entities Determined to be Non-Responsive Bidders/Offerers pursuant to the New York State Iran Divestment Act of 2012" ("Prohibited Entities List") posted at: <https://ogs.ny.gov/list-entities-determined-be-non-responsive-biddersofferers-pursuant-nys-iran-divestment-act-2012>

Contractor further certifies that it will not utilize on this Contract any subcontractor that is identified on the Prohibited Entities List. Contractor agrees that should it seek to renew or extend this Contract, it must provide the same certification at the time the Contract is renewed or extended. Contractor also agrees that any proposed Assignee of this Contract will be required to certify that it is not on the Prohibited Entities List before the contract assignment will be approved by the State Fund.

During the term of the Contract, should the Fund receive information that a person (as defined in State Finance Law § 165-a) is in violation of the above-referenced certifications, the Fund will review such information and offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment activity which is in violation of the Act within 90 days after the determination of such violation, then the Fund shall take such action as may be appropriate and provided for by law, rule, or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

27. ADMISSIBILITY OF REPRODUCTION OF CONTRACT. Notwithstanding the best evidence rule or any other legal principle or rule of evidence to the contrary, the Contractor acknowledges and agrees that it waives any and all objections to the admissibility into evidence at any court proceeding or to the use at any examination before trial of an electronic reproduction of this contract, in the form approved by the State Comptroller, if such approval was required, regardless of whether the original of said contract is in existence.

SCHEDULE I Unit Prices

Refer to Section 4.04 of the Agreement for additional information.

<u>Work or Material Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
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SCHEDULE II Allowance(s)

Refer to Section 4.05 of the Agreement for additional information. The amount(s) indicated below shall be included in the Total Bid amount and their total indicated on the Proposal in the space provided.

<u>Work or Material Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
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SCHEDULE III Field Order Allowance

Refer to Section 4.05A of the Agreement for additional information. The amount indicated below shall be included in the Total Bid amount and indicated on the Proposal in the space provided.

(in words)

(in figures)

LABOR AND MATERIAL BOND

KNOW ALL PERSONS BY THESE PRESENTS, that

(hereinafter called the "Principal") and

(hereinafter called the "Surety") are held and firmly bound to the State University Construction Fund (hereinafter called the "Fund") in the full and just sum of

dollars (\$)

good and lawful money of the United States of America, for the payment of which sum of money, well and truly to be made and done, the Principal binds itself, its heirs, executors, administrators, successors and assigns and the Surety binds itself, its successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract bearing date on the

day of , 20 ,

with the Fund for the

a copy of which Contract is annexed to and hereby made a part of this Bond as though herein set forth in full; and

WHEREAS, the Fund has required this Bond guaranteeing prompt payment of monies due to all persons furnishing the Principal or any subcontractor of the Principal with labor or materials in the prosecution of the work provided in such Contract;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall

promptly pay all monies due to all persons furnishing the

Principal or any subcontractor of the Principal with labor or materials in the prosecution of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, the said Surety, for value received, hereby stipulates and agrees that no change, extension, alteration or addition to the terms of the said Contract or Specifications accompanying the same, shall in any way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension, alteration or addition; and further.

PROVIDED, HOWEVER, the place of trial of any action on this Bond shall be in the county in which the said Contract was to be performed, or if said Contract was to be performed in more than one county, then in any such county, and not elsewhere; and further

PROVIDED, HOWEVER, this Bond shall be enforceable in accordance with the terms and provisions of Section 137 of the State Finance Law.

IN WITNESS WHEREOF, the Principal has hereunto set its hand and seal and the Surety has caused this instrument to be signed by its attorney-in-fact and its corporate seal to be hereto affixed this

day of , 20 .

Principal

By _____

(If Corporation, affix corporate seal)

Surety

By _____

(If Corporation, affix corporate seal)

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that

(hereinafter called the "Principal") and

(hereinafter called the "Surety") are held and firmly bound to the State University Construction Fund (hereinafter called the "Fund") in the full and just sum of

dollars (\$)

good and lawful money of the United States of America, for the payment of which sum of money, well and truly to be made and done, the Principal binds itself, its heirs, executors, administrators, successors and assigns and the Surety binds itself, its successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract bearing date on the day of , 20 , with the Fund for the

a copy of which Contract is annexed to and hereby made part of this Bond as though herein set forth in full; and

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, its representatives or assigns, shall well and faithfully comply with and perform all the terms, covenants and conditions of said Contract on its part to be kept and performed and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to the true intent and meaning of said Contract, including repair and/or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the Fund from all cost and damage which it may suffer by reason of failure to do so, and shall fully reimburse and repay the Fund for all outlay and expense which the Fund may incur in making good any such default, and shall protect the said Fund against, and pay any and all amounts, damages, costs and judgments which may or shall be recovered against said Fund or its trustees, officers, agents or employees or which the said Fund may be called upon to pay to any person or corporation by reason of any damages arising or growing out of the doing of said work, or the repair of maintenance thereof, or the manner of doing the same, or the neglect of the said Principal, or its agents, or the improper performance of the said work by the said Principal, or its agents, or the infringement of any patent or patent rights by reason of the use of any materials furnished or

work done as aforesaid or otherwise, then this obligation shall be null and void, otherwise to remain in full force and effect;

PROVIDED, HOWEVER, the said Surety, for value received, hereby stipulates and agrees, if requested to do so by the Fund, to fully perform and complete the work mentioned and described in said Contract, pursuant to the terms, conditions, and covenants thereof, if for any cause the Principal fails or neglects to so fully perform and complete such work and the Surety further agrees to commence such work of completion within ten (10) calendar days after written notice thereof from the Fund and to complete such work within 10 (10) calendar days from the expiration of the time allowed the Principal in the Contract for the completion thereof; and further

PROVIDED, HOWEVER, the Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety and its Bond shall be in no way impaired or affected by an extension of time, modification, omission, addition, or change in or to the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer of any work to be performed or any monies due or to become due thereunder or by the Fund's takeover, use, occupancy or operation of any part or all of the work covered by the Contract; and said Surety does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts, transfers, takeovers, uses, occupancies or operations, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety as though done or omitted to be done by or in relation to said Principal.

IN WITNESS WHEREOF, the Principal has hereunto set its hand and seal and the Surety has caused this instrument to be signed by its attorney-in-fact, and its corporate seal to be hereunto affixed this day of , 20 .

Principal

By _____

(If Corporation, affix corporate seal)

Surety

By _____

(If Corporation, affix corporate seal)

ACKNOWLEDGMENTS FOR BONDS

(ACKNOWLEDGMENT BY PRINCIPAL, UNLESS IT BE A CORPORATION)

STATE OF)
) ss.:
COUNTY OF)

On this _____ day of _____, 20_____, before me personally came

_____, to me known and known to me to be the person(s)
described in and who executed the foregoing instrument and acknowledged that he executed the same.

Notary Public

(ACKNOWLEDGMENT BY PRINCIPAL, IF A CORPORATION)

STATE OF)
) ss.:
COUNTY OF)

On this _____ day of _____, 20_____, before me personally came

_____, to me known who, being by me

duly sworn, did depose and say that he resides in _____;

that he is the _____ of the

_____, the corporation described in and
which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said
instrument is such corporate seal; that is was so affixed by order of the Board of Directors of said corporation and that he
signed h name thereto by like order.

Notary Public

(ACKNOWLEDGMENT BY SURETY COMPANY)

STATE OF)
) ss.:
COUNTY OF)

On this _____ day of _____, 20_____, before me personally came

_____, to me known who, being by me

duly sworn, did depose and say that he resides in _____;

that he is the _____ of the _____,
the corporation described in and which executed the foregoing instrument; that he knows the seal of said
corporation; that the seal affixed to said instrument is such corporate seal; that is was so affixed by order of the Board of
Directors of said corporation and that he signed h name thereto by like order; and that the liabilities of said
company do not exceed its assets as ascertained in the manner provided by the laws of the State of New York.

Notary Public

00 73 43 Wage Rate Requirements

Wage Rates and Supplements

The following are the rates of wages and supplements determined by the Industrial Commissioner of the State of New York as prevailing in the locality of the site at which the work will be performed:

*Effective 7/1/01, NYSDOL stopped providing individually printed copies of the **updated** schedules on existing contracts. Updated schedules may be obtained on the NYSDOL website:*

<http://www.labor.state.ny.us>



Andrew M. Cuomo, Governor

Roberta Reardon, Commissioner

State University of New York

JOHN O'CONNOR, Associate
307 SEVENTH AVENUE, 1501
NEW YORK NY 10001

Schedule Year 2020 through 2021
Date Requested 08/05/2020
PRC# 2020008156

Location SUNY New Paltz
Project ID# 081047-00
Project Type Replace Roofs at the Smiley Arts Building, College Theatre, Dorsky Museum, and Faculty Office Building

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2020 through June 2021. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission; a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion [online](#).

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the ["Request for a dispensation to work overtime" form \(PW30\)](#) and ["4 Day / 10 Hour Work Schedule" form \(PW 30.1\)](#).

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid

or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers' compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.



Andrew M. Cuomo, Governor

Roberta Reardon, Commissioner

State University of New York

JOHN O'CONNOR, Associate
307 SEVENTH AVENUE, 1501
NEW YORK NY 10001

Schedule Year 2020 through 2021
Date Requested 08/05/2020
PRC# 2020008156

Location SUNY New Paltz
Project ID# 081047-00
Project Type Replace Roofs at the Smiley Arts Building, College Theatre, Dorsky Museum, and Faculty Office Building

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

Contractor Information

All information must be supplied

Federal Employer Identification Number: _____		
Name: _____		
Address: _____ _____		
City: _____	State: _____	Zip: _____
Amount of Contract: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

Phone: (518) 457-5589 Fax: (518) 485-1870
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Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, www.labor.ny.gov. <https://labor.ny.gov/formsdocs/ui/IA999.pdf>

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov.

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.



Required Notice under Article 25-B of the Labor Law

**Attention All Employees, Contractors and Subcontractors:
You are Covered by the Construction Industry Fair Play Act**

The law says that you are an employee unless:

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

Penalties for paying workers off the books or improperly treating employees as independent contractors:

- **Civil Penalty**
 - First offense: Up to \$2,500 per employee
 - Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty**
 - First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 - Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)

Attention Employees

THIS IS A: **PUBLIC WORK PROJECT**

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Chapter 629 of
the Labor Laws
of 2007:

**These wages are set by law and must be posted
at the work site. They can also be found at:**
www.labor.ny.gov

If you feel that you have not received proper wages or benefits,
please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5156		

* For New York City government agency construction projects, please
contact the Office of the NYC Comptroller at (212) 669-4443, or
www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
 Bureau of Public Work
 State Office Campus, Bldg. 12
 Albany, NY 12240

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Ulster County General Construction

Boilermaker	08/01/2020
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JOB DESCRIPTION Boilermaker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2020 01/01/2021

Boilermaker	\$ 61.24	\$63.38
Repairs & Renovations	61.24	63.38

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2020 01/01/2021

Boilermaker	32% of hourly	32% of hourly
Repair \$ Renovations	Wage Paid	Wage Paid
	+ \$ 25.35	+ TBA

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

Repairs & Renovation see (B,E,Q)

HOLIDAY

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE

NOTE: *Employee must work in pay week to receive Holiday Pay.

**Employee gets 4 times the hourly wage rate for working Labor Day.

REGISTERED APPRENTICES

Wage per hour:

(1/2) Year Terms at the following percentage of Boilermaker's Wage

1st	2nd	3rd	4th	5th	6th	7th
65%	70%	75%	80%	85%	90%	95%

Supplemental Benefits Per Hour:

	07/01/2020	01/01/2021
Apprentice(s)	32% of Hourly	32% of Hourly
	Wage Paid Plus	Wage Paid Plus
	Amount Below	Amount Below

1st Term	\$ 19.38	\$ TBA
2nd Term	20.24	TBA
3rd Term	21.08	TBA
4th Term	21.94	TBA
5th Term	22.79	TBA
6th Term	23.65	TBA
7th Term	24.48	TBA

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

Carpenter - Building / Heavy&Highway	08/01/2020
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JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 2

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

PARTIAL COUNTIES

Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing west to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

WAGES

Wages per hour:	07/01/2020	07/01/2021 Additional
Carpenter - ONLY for Artificial Turf/Synthetic Sport Surface	\$ 31.48	\$ 1.15

Note - Does not include the operation of equipment. Please see Operating Engineers rates.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 23.65
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OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid:	See (5) on HOLIDAY PAGE
Overtime:	See (5, 6, 16) on HOLIDAY PAGE

Notes:

When a holiday falls upon a Saturday, it shall be observed on the preceding Friday. When a holiday falls upon a Sunday, it shall be observed on the following Monday.

An employee taking an unexcused day off the regularly scheduled day before or after a paid Holiday shall not receive Holiday pay.

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
55%	60%	70%	80%

Supplemental Benefits per hour:

1st year term	\$ 11.80
2nd year term	11.80
3rd year term	14.45
4th year term	14.45

2-42AtSS

Carpenter - Building / Heavy&Highway

08/01/2020

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Columbia, Dutchess, Orange, Sullivan, Ulster

WAGES

WAGES:(per hour)		
BUILDING/HEAVY&HIGHWAY/TUNNEL	07/01/2020	07/01/2021 Additional
Carpenter, Dockbuilder, Piledriver, Dive Tender, and Diver (Dry)	\$ 39.02	\$ 0.80
Diver (Wet)	\$ 54.76	

SHIFT DIFFERENTIAL: When mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

NOTE: Carpenters employed in the removal or abatement of asbestos or any toxic or hazardous material or required to work near asbestos or any toxic or hazardous material and required to wear protective equipment shall receive two (2) hours extra pay per day, plus applicable benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 28.03
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OVERTIME PAY

BUILDING:

See (B, E, Q) on OVERTIME PAGE.

HEAVY&HIGHWAY/TUNNEL:

See (B, E, P, *R, **T, X) on OVERTIME PAGE.

*R applies to Heavy&Highway/Tunnel Overtime Holiday Code 25 with benefits at straight time rate.

**T applies to Heavy&Highway/Tunnel Overtime Holiday Codes 5 & 6 with benefits at straight time rate.

HOLIDAY

BUILDING:

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.

Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:

Paid: See (5, 6, 25) on HOLIDAY PAGE including benefits.

Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

1 Year terms at the following wage rates.

Indentured after July 1 2016

1st	2nd	3rd	4th	5th
\$ 19.68	\$ 23.11	\$ 24.82	\$ 26.53	\$ 29.96

Indentured before July 1 2016

1st	2nd	3rd	4th
\$ 19.68	\$ 23.11	\$ 26.53	\$ 29.96

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.33

11-279.2B/H&H

Carpenter - Floor Coverer

08/01/2020

JOB DESCRIPTION Carpenter - Floor Coverer

DISTRICT 11

ENTIRE COUNTIES

Columbia, Sullivan, Ulster

PARTIAL COUNTIES

Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing west to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

WAGES

WAGES:(per hour)

	07/01/2020	07/01/2021
		Additional
Carpet/Resilient Floor Coverer	\$ 39.02	\$ 0.80

SHIFT DIFFERENTIAL: When mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen (15) percent of wage plus applicable benefits.

NOTE: Carpenters employed in the removal or abatement of asbestos or any toxic or hazardous material or required to work near asbestos or any toxic or hazardous materials and required to wear protective equipment shall receive two (2) hours extra pay per day, plus applicable benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journey worker \$ 28.03

OVERTIME PAY

BUILDING:

See (B, E, Q) on OVERTIME PAGE.

HEAVY/HIGHWAY:

See (B, E, P, *R, **T, X) on OVERTIME PAGE.

*R applies to Heavy/Highway Overtime Holiday Code 25 with benefits at straight time rate.

**T applies to Heavy/Highway Overtime Holiday Codes 5 & 6 with benefits at straight time rate.

HOLIDAY

BUILDING:

Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.
Holidays that fall on Sunday will be observed Monday.

HEAVY/HIGHWAY:

Paid: See (5, 6, 25) on HOLIDAY PAGE including benefits.
Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

1 Year terms at the following wage rates.

Indentured after July 1 2016

1st	2nd	3rd	4th	5th
\$ 19.68	\$ 23.11	\$ 24.82	\$ 26.53	\$ 29.96

Indentured before July 1 2016

1st	2nd	3rd	4th
\$ 19.68	\$ 23.11	\$ 26.53	\$ 29.96

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.33

11-279.2Floor

Electrician

08/01/2020

JOB DESCRIPTION Electrician

DISTRICT 11

ENTIRE COUNTIES

Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Only in the Townships of Andes, Harpersfield, Kortwright, Stamford, Bovina, Roxbury, Middletown and those portions of Colchester and Hancock south of the East Branch of the Delaware River.

Dutchess: All of the county except for the towns of Fishkill, East Fishkill, and Beacon.

Greene: That portion of the county south of a line following the south limits of the city of Catskill in a Westerly direction from the Hudson River to Highway 23A along 23A to the road following the Little Westkill and continuing along this road to Delaware County.

WAGES

Per hour:

Electrician Wireman/ Technician	07/01/2020	04/01/2021
Electrical/Technician Projects		
under \$ 250,000.00	\$ 42.00	\$ 43.00
over \$ 250,000.00	\$ 46.00	\$ 47.00

SHIFT DIFFERENTIAL: On Public Work in New York State when shift work is mandated either in the job specifications or by the contracting agency, the following rates apply:

Shift worked between 4:30pm & 12:30am

Electrical/Technician Projects

under \$ 250,000.00	\$ 49.28	\$ 50.45
over \$ 250,000.00	\$ 53.97	\$ 55.15

Shift worked between 12:30am & 8:30am

Electrical/Technician Projects

under \$ 250,000.00	\$ 55.20	\$ 56.51
over \$ 250,000.00	\$ 60.46	\$ 61.77

NOTE ADDITIONAL AMOUNTS PAID FOR THE FOLLOWING WORK LISTED BELOW (subject to overtime premiums):

- On jobs where employees are required to work from boatswain chairs, swinging scaffolds, etc., forty (40) feet or more above the ground, or under compressed air, using Scottair packs, gas masks or in shafts or tunnels, they shall receive an additional \$2.00 per hour above the regular straight time rate.

- Journeyman Wireman when performing welding or cable splicing: \$2.00 above the Journeyman Wireman rate of pay

- Journeyman Wireman required to have a NYS Asbestos Certificate: \$2.00 above the Journeyman Wireman rate of pay

- Journeyman Wireman required to have a CDL: \$2.00 above the Journeyman Wireman rate of pay.

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2020	04/01/2021
Journeyman	\$ 32.38 plus 3% of straight or premium wage	\$ 33.69 plus 3% of straight or premium wage

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 13, 15, 16, 25) on HOLIDAY PAGE

When the holiday falls on a Saturday it is observed the Friday before. When the holiday falls on a Sunday it is observed on the Monday after.

REGISTERED APPRENTICES

WAGES:

(1)year terms at the following rates

07/01/2020	1st	2nd	3rd	4th	5th	6th
1st Shift	\$ 13.20	\$ 17.60	\$ 22.00	\$ 26.40	\$ 30.80	\$ 33.00
2nd Shift	15.49	20.65	25.81	30.98	36.14	38.72
3rd Shift	17.35	23.13	28.91	34.70	40.48	43.47
04/01/2021	1st	2nd	3rd	4th	5th	6th
1st Shift	\$ 13.50	\$ 18.00	\$ 22.50	\$ 27.00	\$ 31.50	\$ 33.75
2nd Shift	15.84	21.12	26.40	31.68	36.96	39.60
3rd Shift	17.74	23.66	29.57	35.48	41.40	44.36

SUPPLEMENTAL BENEFITS per hour:

07/01/2020

1st term	\$ 14.92 plus 3% of straight or premium wage
2nd term	\$ 16.42 plus 3% of straight or premium wage
3rd term	\$ 18.42 plus 3% of straight or premium wage
4th term	\$ 19.92 plus 3% of straight or premium wage
5th & 6th term	\$ 21.92 plus 3% of straight or premium wage

09/01/2020

1st term	\$ 15.81 plus 3% of straight or premium wage
2nd term	\$ 16.31 plus 3% of straight or premium wage
3rd term	\$ 18.31 plus 3% of straight or premium wage
4th term	\$ 19.81 plus 3% of straight or premium wage
5th term	\$ 21.81 plus 3% of straight or premium wage
6th term	\$ 22.31 plus 3% of straight or premium wage

11-363/2

Elevator Constructor

08/01/2020

JOB DESCRIPTION Elevator Constructor

DISTRICT 1

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury, Hancock & Stamford

Rockland: Only the Township of Stony Point.

Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per Hour	07/01/2020	01/01/2021
Mechanic	\$ 60.49	\$62.51
Helper	70% of Mechanic Wage Rate	70% of Mechanic Wage Rate

Four (4), ten (10) hour days may be worked for New Construction and Modernization Work at straight time during a week, Monday thru Thursday or Tuesday thru Friday.

***Four (4), ten (10) hour days are not permitted for Contract Work/Repair Work

NOTE - In order to use the '4 Day/10 Hour Work Schedule' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule', form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour

	07/01/2020	01/01/2021
Journey person/Helper	\$ 34.765*	\$ 34.825*

(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

REGISTERED APPRENTICES

Wages per hour:

0-6 mo*	6-12 mo	2nd yr	3rd yr	4th yr
50 %	55 %	65 %	70 %	80 %

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journey person/Helper

1-138

Glazier

08/01/2020

JOB DESCRIPTION Glazier

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per hour:	7/01/2020	5/31/2021
		Additional
Glazier	\$ 57.55	\$ 2.00
*Scaffolding	58.55	
Glass Tinting &	29.17	
Window Film		
**Repair & Maintenance	29.17	

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building, whenever performed, where the total cumulative contract value is under \$148,837. All Glass tinting, window film, regardless of material or intended use, and all affixing of decals to windows or glass.

SUPPLEMENTAL BENEFITS

Per hour:	7/01/2020
Journey worker	\$ 34.59
Glass tinting &	20.29
Window Film	
Repair & Maintenance	20.29

OVERTIME PAY

See (B,H,V) on OVERTIME PAGE.

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' see (B, B2, I, S) on overtime page.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' Only

Paid: See(5, 6, 16, 25)

Overtime: See(5, 6, 16, 25)

REGISTERED APPRENTICES

Wage per hour:

(1) year terms at the following wage rates:

7/01/2020

1st term	\$ 20.14
2nd term	28.21
3rd term	34.10
4th term	45.80

Supplemental Benefits:

(Per hour)

1st term	\$ 16.16
2nd term	22.76
3rd term	25.16
4th term	29.73

8-1087 (DC9 NYC)

Insulator - Heat & Frost

08/01/2020

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 1

ENTIRE COUNTIES

Albany, Columbia, Delaware, Essex, Fulton, Greene, Hamilton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, Sullivan, Ulster, Warren, Washington

WAGES

Wages per hour 07/01/2020

Asbestos Worker*	\$ 36.36
Insulator*	36.36
Firestopping Worker*	30.91

(*)On Mechanical Systems only.

On government mandated shift work additional 12% of wage for all shifts starting after 3:30 P.M.

SUPPLEMENTAL BENEFITS

Per hour

Journey person \$ 22.78

OVERTIME PAY

See (*B1, **Q) on OVERTIME PAGE

*B1=Double time begins after 10 hours on Saturday

**Q=Triple time on Labor Day if worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

When a holiday falls on Sunday the following Monday shall be observed as the holiday.

REGISTERED APPRENTICES

Wages per hour

one year terms at the following percentage of Journey person's wage.

1st	2nd	3rd	4th
60 %	70 %	80 %	90 %

Supplemental Benefits per hour worked:

Apprentices \$ 22.78

1-40

Ironworker

08/01/2020

JOB DESCRIPTION Ironworker

DISTRICT 11

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster

WAGES

Per hour:

07/01/2020

Structural	\$ 48.98
Reinforcing*	48.98
Ornamental	48.98
Chain Link Fence	48.98

*NOTE: For Reinforcing classification ONLY, Ironworker 4-46Reinf rates apply in Rockland County's southern section (south of Convent Road and east of Blue Hills Road).

On Government Mandated Irregular Work Days or Shift Work, the following wage will be paid:

1st Shift	\$ 48.98
2nd Shift	62.38
3rd Shift	66.85

**Note- Any shift that works past 12:00 midnight shall receive the 3rd shift differential.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 40.35
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OVERTIME PAY

See (B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16) on HOLIDAY PAGE

If a holiday falls on Saturday, it will be observed Friday. If a holiday falls on Sunday, it will be observed Monday.

REGISTERED APPRENTICES

Wages:

(1) year terms at the following wage:

	1st yr	2nd yr	3rd yr	4th yr
1st Shift	\$ 24.49	\$ 29.39	\$ 34.29	\$ 39.18
2nd Shift	33.35	39.16	44.97	50.76
3rd Shift	36.31	42.42	48.53	54.63

Supplemental Benefits per hour:

1st year	\$ 34.60
2nd year	35.75
3rd year	36.90
4th year	38.05

11-417

Laborer - Building

08/01/2020

JOB DESCRIPTION Laborer - Building

DISTRICT 11

ENTIRE COUNTIES

Orange, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Only the Townships of Andes, Bovina, Davenport, Delhi, Franklin, Hamden, Harpersfield, Kortright, Meredith, Middletown, Roxbury, and Stamford.

Greene: Only the Township of Catskill.

WAGES

GENERAL LABORER: flag person, portable generator tender, portable pump tender, temporary heat tender, chipping hammer, acoustic pump, mixer, concrete laborer, demolition, demo saw, gunite, general cleanup, landscaping, mason tender, jackhammer, pavement breaker, pressure blasting, signalperson, buggies, wrecking, chain saw, vacuums, cutting torch, discharge pipe, mega mixer, pump crete machine.

INTERMEDIATE LABORER: excavation, grading, backfilling, tampers, walk behind roller, when OSHA or contractor requires negative respirator.

PREMIUM LABORER: Asbestos abatement work, toxic and hazardous abatement, lead abatement work, environmental work.

WAGES:(per hour)

	07/01/2020	06/01/2021	06/01/2022
General	\$ 37.20	\$ 38.25	\$ 39.30

Intermediate	39.00	40.10	41.20
Premium	41.85	43.00	44.20

These rates will cover all work within five feet of the building foundation line.

Shift Differential: On all Governmental mandated irregular or off shift work, an additional 25% of wage is required. The 25% shift differential will be paid on public works contract for shifts or irregular workdays outside the normal working hours for 2nd and 3rd shifts or irregular work day or when mandated or required by state, federal, county, local or other governmental agency contracts.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 29.93	\$ 30.95	\$ 32.00
Shift	36.70	37.97	39.28

OVERTIME PAY

See (B, E, E5, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

Holidays that fall on Saturday shall be observed on Friday, when holidays fall on Sunday they shall be observed on Monday.

REGISTERED APPRENTICES

1000 hour terms at the following wage rates:

1st term	\$ 20.46	\$ 21.04	\$ 21.62
2nd term	24.18	24.86	25.55
3rd term	27.90	28.69	29.48
4th term	31.62	32.51	33.41

Supplemental Benefits per hour:

Apprentices	\$ 24.83	\$ 25.85	\$ 26.90
Shift	30.17	31.44	32.75

11-17.BA

Laborer - Heavy&Highway

08/01/2020

JOB DESCRIPTION Laborer - Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Orange, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Only the Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Meredith, and Davenport.

Greene: Only the Township of Catskill.

WAGES

CLASS 1: Flagperson, gateperson.

CLASS 2: General laborer, chuck tender, nipper, powder carrier, magazine tender, concrete men, vibrator men, mason tender, mortar men, traffic control, custodial work, temporary heat, pump men, pit men, dump men, asphalt men, joint setter, signalman, pipe men, riprap, dry stone layers, jack hammer, bush hammer, pavement breaker, gunnite nozzle, men on mulching & seeding machines, all seeding & sod laying, landscape work, walk behind self-propelled power saws, grinder, groover, walk behind rollers and tampers of all types, burner men, filling and wiring of baskets for gabion walls, chain saw operator, railroad track laborers, power buggy & pumpcrete ops., plaster & acoustic pump, power brush cutter, retention liners, walk behind surface planer, chipping hammer, manhole, catch basin or inlet installing, mortar mixer, laser men. *Micropaving and crack sealing.

CLASS 3: Asbestos, toxic, bio remediation and phyto remediation, lead or hazardous materials abatement when certification or license is required, Drilling Equipment Only Where a Separate Air Compressor Unit Supplies Power.

CLASS 4: Asphalt screedman, blaster, all laborers involved in pipejacking and boring operations not exceeding more than 10 feet into pipe, boring or drilled area.

WAGES:(per hour)

07/01/2020

CLASS 1	\$ 35.25
CLASS 2	40.00
CLASS 3	44.25
CLASS 4	49.10

*NOTE: Micropaving and crack sealing laborers shall receive \$2.50 per hour over the CLASS 2 rate.

SHIFT DIFFERENTIAL: On all NYS D.O.T. or other Governmental mandated irregular or off shift work, an additional 15% of wage is required.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 29.75
Shift	33.81

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

Employees that work on a holiday which falls on a Saturday, shall be paid two and one-half (2-1/2) times the regular hourly rate for all hours worked on that day.

HOLIDAY

Paid:	See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime:	See (5, 6, 15, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

1000 hour terms at the following wage rates.

1st term	\$ 20.46
2nd term	24.18
3rd term	27.90
4th term	31.62

Supplemental Benefits per hour:

Apprentices	\$ 24.65
Shift	27.85

11-17.1H/H

Laborer - Tunnel

08/01/2020

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 11

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

PARTIAL COUNTIES

Chenango: Townships of Columbus, Sherburne and New Berlin.

Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and Davenport.

WAGES

Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

	07/01/2020	07/01/2021	07/01/2022
Class 1	\$ 50.45	\$ 51.95	\$ 53.45
Class 2	52.60	54.10	55.60
Class 4	59.00	60.50	62.00
Class 5	42.25	43.50	44.80

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional \$ 3.00 an hour.

SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:

- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

SUPPLEMENTAL BENEFITS

Per hour:

Benefit 1	\$ 32.15	\$ 33.25	\$ 34.45
Benefit 2	48.15	49.80	51.60
Benefit 3	64.15	66.35	68.75

Benefit 1 applies to straight time hours, paid holidays not worked.

Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.

Benefit 3 applies to Sunday and Holiday hours worked.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

REGISTERED APPRENTICES

FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

Lineman Electrician

08/01/2020

JOB DESCRIPTION Lineman Electrician

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

WAGES

Per hour:

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines

Below rates applicable on all overhead and underground distribution and maintenance work, and all overhead and underground transmission line work and the installation of fiber optic cable where no other construction trades are or have been involved. (Ref #14.01.01)

07/01/2020

Lineman, Technician	\$ 53.50
Crane, Crawler Backhoe	53.50
Welder, Cable Splicer	53.50
Digging Mach. Operator	48.15
Tractor Trailer Driver	45.48
Groundman, Truck Driver	42.80
Equipment Mechanic	42.80
Flagman	32.10

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all electrical sub-stations, switching structures, fiber optic cable and all other work not defined as "Utility outside electrical work". (Ref #14.02.01-A)

Lineman, Technician	\$ 53.50
Crane, Crawler Backhoe	53.50
Cable Splicer	58.85
Certified Welder -	
Pipe Type Cable	56.18
Digging Mach. Operator	48.15
Tractor Trailer Driver	45.48
Groundman, Truck Driver	42.80
Equipment Mechanic	42.80
Flagman	32.10

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates apply on switching structures, maintenance projects, railroad catenary install/maintenance third rail installation, bonding of rails and pipe type cable and installation of fiber optic cable. (Ref #14.02.01-B)

Lineman, Tech, Welder	\$ 54.82
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Crane, Crawler Backhoe	54.82
Cable Splicer	60.30
Certified Welder -	
Pipe Type Cable	57.56
Digging Mach. Operator	49.34
Tractor Trailer Driver	46.60
Groundman, Truck Driver	43.86
Equipment Mechanic	43.86
Flagman	32.89

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all overhead and underground transmission line work & fiber optic cable where other construction trades are or have been involved. This applies to transmission line work only, not other construction. (Ref #14.03.01)

Lineman, Tech, Welder	\$ 56.01
Crane, Crawler Backhoe	56.01
Cable Splicer	56.01
Digging Mach. Operator	50.41
Tractor Trailer Driver	47.61
Groundman, Truck Driver	44.81
Equipment Mechanic	44.81
Flagman	33.61

Additional \$1.00 per hour for entire crew when a helicopter is used.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM to 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM to 1:00 AM REGULAR RATE PLUS 17.3 %
3RD SHIFT	12:30 AM to 9:00 AM REGULAR RATE PLUS 31.4 %

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (also required on non-worked holidays):

The following SUPPLEMENTAL BENEFITS apply to all classification categories of CONSTRUCTION, TRANSMISSION and DISTRIBUTION.

Journeyman	\$ 24.90
	*plus 6.75% of hourly wage

*The 6.75% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for all emergency work designated by the Dept. of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid	See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
Overtime	See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour: Same as Journeyman

6-1249a

Lineman Electrician - Teledata

08/01/2020

JOB DESCRIPTION Lineman Electrician - Teledata

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

	07/01/2020	01/01/2021
Cable Splicer	\$ 33.77	\$ 34.78
Installer, Repairman	\$ 32.05	\$ 33.01
Teledata Lineman	\$ 32.05	\$ 33.01
Tech., Equip. Operator	\$ 32.05	\$ 33.01
Groundman	\$ 16.99	\$ 17.50

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED:

1ST SHIFT	REGULAR RATE
2ND SHIFT	REGULAR RATE PLUS 10%
3RD SHIFT	REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 5.06	\$ 5.06
	*plus 3% of wage paid	*plus 3% of wage paid

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting

08/01/2020

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting

DISTRICT 6

ENTIRE COUNTIES

Columbia, Dutchess, Orange, Putnam, Rockland, Ulster

WAGES

Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

A Groundman/Groundman Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.
(Ref #14.01.02)

Per hour: 07/01/2020

Lineman, Technician	\$ 47.48
Crane, Crawler Backhoe	47.48
Certified Welder	49.85
Digging Machine	42.73
Tractor Trailer Driver	40.36
Groundman, Truck Driver	37.98
Equipment Mechanic	37.98
Flagman	28.49

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman	\$ 24.90
	*plus 6.75% of hourly wage

* The 6.75% is based on the hourly wage paid, straight time rate or premium rate.

Supplements paid at STRAIGHT TIME rate for holidays.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for all emergency work designated by the Dept. of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked.

Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms.

	07/01/2020
1st term	\$ 28.49
2nd term	30.86
3rd term	33.24
4th term	35.61

5th term	37.98
6th term	40.36
7th term	42.73

SUPPLEMENTAL BENEFITS per hour: Same as Journeyman

6-1249aReg8LT

Lineman Electrician - Tree Trimmer

08/01/2020

JOB DESCRIPTION Lineman Electrician - Tree Trimmer

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

WAGES

Applies to line clearance, tree work and right-of-way preparation on all new or existing energized overhead or underground electrical, telephone and CATV lines. This also would include stump removal near underground energized electrical lines, including telephone and CATV lines.

Per hour:	07/01/2020	01/03/21	01/02/22	01/01/23
Tree Trimmer	\$ 26.56	\$ 27.36	\$ 28.25	\$ 29.59
Equipment Operator	23.49	24.19	24.98	26.17
Equipment Mechanic	23.49	24.19	24.98	26.17
Truck Driver	19.56	20.15	20.80	21.79
Groundman	16.11	16.59	17.13	17.94
Flag person	11.61	11.96	12.35	12.94

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman	\$ 9.98	\$ 9.98	\$ 10.23	\$ 10.48
	*plus 3% of hourly wage	*plus 3% of hourly wage	*plus 3% of hourly wage	*plus 3% of hourly wage

* The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked.

Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 16, 25) on HOLIDAY PAGE

NOTE: All paid holidays falling on a Saturday shall be observed on the preceding Friday.

All paid holidays falling on a Sunday shall be observed on the following Monday.

6-1249TT

Mason - Building

08/01/2020

JOB DESCRIPTION Mason - Building

DISTRICT 11

ENTIRE COUNTIES

Dutchess, Sullivan, Ulster

PARTIAL COUNTIES

Orange: Entire county except the Township of Tuxedo.

WAGES

Per hour:	07/01/2020
Bricklayer	\$ 41.31
Cement Mason	41.31
Plasterer/Stone Mason	41.31
Pointer/Caulker	41.31

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:

Irregular work day requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 34.44

OVERTIME PAY

Cement Mason See (B, E, Q, W) on OVERTIME PAGE.
All Others See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5du-b

Mason - Building	08/01/2020
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JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Sullivan, Ulster

WAGES

Per hour:

07/01/2020	12/07/2020
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Building:

Tile, Marble,& Terrazzo	Additional
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Mechanic/Setter	\$54.63	\$0.79
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SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker: \$ 22.31*
+ \$7.50

* This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

Double time rate applies after 10 hours

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

(Counties of Orange & Putnam)

750 hour terms at the following wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1-	751-	1501-	2251-	3001-	3751-	4501-	5251-	6001-	6751-
750	1500	2250	3000	3750	4500	5250	6000	6750	7500
07/01/2020									
\$20.35	\$25.11	\$32.09	\$36.83	\$40.25	\$43.50	\$46.95	\$51.69	\$54.34	\$58.19

Supplemental Benefits per hour:
(Counties of Orange & Putnam)

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$12.55*	\$12.55*	\$15.06*	\$15.06*	\$16.06*	\$17.56*	\$18.56*	\$18.56*	\$16.56*	\$21.81*
+\$0.66	+\$0.70	+\$0.80	+\$0.85	+\$1.23	+\$1.27	+\$1.62	+\$1.67	+\$5.82	+\$6.31

Wages per hour:
(Counties of Dutchess, Sullivan, Ulster)

750 hour terms at the following wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1-	751-	1501-	2251-	3001-	3751-	4501-	5251-	6001-	6751-
750	1500	2250	3000	3750	4500	5250	6000	6750	7500
\$19.16	\$23.16	\$25.14	\$29.14	\$31.81	\$35.32	\$38.52	\$41.52	\$43.05	\$46.30

Supplemental Benefits per hour:
(Counties of Dutchess, Sullivan, Ulster)

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$12.55*	\$12.55*	\$14.56*	\$14.56*	\$15.56*	\$16.06*	\$16.56*	\$17.56*	\$15.56*	\$20.31*
+\$0.64	+\$0.68	+\$0.73	+\$0.77	+\$1.14	+\$1.18	+\$1.52	+\$1.56	+\$6.08	+\$6.16

9-7/52B

Mason - Building	08/01/2020
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JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Sullivan, Ulster

WAGES

Per hour:	07/01/2020	12/07/2020
Building		
Tile, Marble, &		Additional
Terrazzo Finisher	\$ 45.12	\$0.67

SUPPLEMENTAL BENEFITS

Journeyworker:

Per Hour	\$ 19.16*
	+ \$7.37

*This portion of benefits subject to same premium rate as shown for overtime wages

OVERTIME PAY

See (A, *E, Q) on OVERTIME PAGE

Double time rate applies after 10 hours on Saturdays.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88B-tf

Mason - Building **08/01/2020**

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Wages: 07/01/2020 01/14/2021

Additional

Marble Cutters & Setters \$ 60.35 \$0.95

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 37.24

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1-750	751-1500	1501-2250	2251-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6751	6751-7500
07/01/2020									
\$24.15	\$27.15	\$30.16	\$33.19	\$36.20	\$39.20	\$42.15	\$45.26	\$51.28	\$57.34

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$20.14	\$21.58	\$23.02	\$24.42	\$25.85	\$27.29	\$28.72	\$30.12	\$32.98	\$35.81

9-7/4

Mason - Heavy&Highway **08/01/2020**

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Dutchess, Sullivan, Ulster

PARTIAL COUNTIES

Orange: Entire county except the Township of Tuxedo.

WAGES

Per hour:

07/01/2020

Bricklayer \$ 41.82
Cement Mason 41.82
Marble/Stone Mason 41.82
Plasterer 41.82
Pointer/Caulker 41.82

Additional \$1.00 per hour for power saw work

Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

Irregular work day requires 15% premium

Second shift an additional 15% of wage plus benefits to be paid

Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:
Journeyman \$ 34.43

OVERTIME PAY

Cement Mason See (B, E, Q, W, X)
All Others See (B, E, Q, X)

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 25) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5du-H/H

Millwright

08/01/2020

JOB DESCRIPTION Millwright

DISTRICT 2

ENTIRE COUNTIES

Sullivan, Ulster

WAGES

Per hour: 07/01/2020

Building \$ 35.70
Heavy & Highway 37.70

NOTE ADDITIONAL PREMIUMS PAID FOR THE FOLLOWING WORK LISTED BELOW (amount subject to any overtime premiums):

- Certified Welders shall receive \$1.75 per hour in addition to the current Millwrights rate provided he/she is directed to perform certified welding.
- For Building work if a work site has been declared a hazardous site by the Owner and the use of protective gear (including, as a minimum, air purifying canister-type chemical respirators) are required, then that employee shall receive a \$1.50 premium per hour for Building work.
- For Heavy & Highway work if the work is performed at a State or Federally designated hazardous waste site where employees are required to wear protective gear, the employees performing the work shall receive an additional \$2.00 per hour over the millwright heavy and highway wage rate for all hours worked on the day protective gear was worn.
- An employee performing the work of a machinist shall receive \$2.00 per hour in addition to the current Millwrights rate. For the purposes of this premium to apply, a "machinist" is a person who uses a lathe, Bridgeport, milling machine or similar type of tool to make or modify parts.
- When performing work underground at 500 feet and below, the employee shall receive an additional \$1.00.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 29.87

OVERTIME PAY

See (B, E, *E2, Q) on OVERTIME PAGE

*Note - Saturday may be used as a make-up day and worked at the straight time rate of pay during a work week when conditions such as weather, power failure, fire, or natural disaster prevent the performance of work on a regular scheduled work day.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

Note: Any holiday that falls on Sunday shall be observed the following Monday. Any holiday that falls on Saturday shall be observed the preceding Friday.

REGISTERED APPRENTICES

Wages per hour:

(1)year terms at the following percentage of journeymans rate.

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental Benefits per hour:

Apprentices:

1st term	\$ 13.02
2nd term	24.82
3rd term	26.50
4th term	28.19

2-1163.3

Operating Engineer - Building / Heavy&Highway

08/01/2020

JOB DESCRIPTION Operating Engineer - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Delaware, Orange, Rockland, Sullivan, Ulster

WAGES

CLASS A5: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with 140ft boom and over.

CLASS A4: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with 100ft to 139ft boom.

CLASS A3: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes with a boom under 100ft.

CLASS A2: Cranes, Derricks and Pile Drivers less than 100 tons with 140ft boom and over.

CLASS A1: Cranes, Derricks and Piler Drivers less than 100 tons with a 100ft to 139ft boom.

CLASS A: Cranes, Derricks and Pile Drivers less than 100 tons with a boom under 100ft.; Autograde Comb. Subgrader, Base Material Spreader and Base Trimmer (CMI and Similar Types); Autograde Pavement profiler (CMI and Similar Types); Autograde Pavement Profiler and Recycle type (CMI and Similar Type); Autograde Placer-Trimmed-Spreader Comb. (CMI & Similar types); Autograde Slipform Paver (CMI & Similar Types); Central Power Plants (all types); Chief of Party; Concrete Paving Machines; Drill (Baur, AMI and Similar Types); Drillmaster, Quarmaster (Down the Hole Drill), Rotary Drill, Self-Propelled Hydraulic Drill, Self-Powered Drill; Draglines; Elevator Graders; Excavator; Front End Loaders (5 yds. and over); Gradalls; Grader-Rago; Helicopters (Co-Pilot); Helicopters (Communications Engineer); Juntann Pile Driver; Locomotive (Large); Mucking Machines; Pavement & Concrete Breaker, i.e., Superhammer & Hoe Ram; Roadway Surface Grinder; Prentice Truck; Scooper (Loader and Shovel); Shovels; Tree Chopper with Boom; Trench Machines (Cable Plow); Tunnel Boring Machine; Vacuum Truck

CLASS B: "A" Frame; Backhoe (Combination); Boom Attachment on Loaders (Rate based on size of Bucket) not applicable to Pipehook; Boring and Drilling Machines; Brush Chopper, Shredder and Tree Shredder, Tree Shearer; Bulldozer (Fine Grade); Cableways; Carryalls; Concrete Pump; Concrete Pumping System, Pump Concrete and Similar Types; Conveyors (125 ft. and over); Drill Doctor (duties incl. Dust Collector Maintenance); Front End Loaders (2 yds. but less than 5 yds.); Graders (Finish); Groove Cutting Machine (Ride on Type); Heater Planer; Hoists (all type Hoists, shall also include Steam, Gas, Diesel, Electric, Air Hydraulic, Single and Double Drum, Concrete, Brick Shaft Caisson, Snorkel Roof, and/or any other Similar Type Hoisting Machines, portable or stationary, except Chicago Boom Type); Long Boom Rate to be applied if Hoist is "Outside Material Tower Hoist"; Hydraulic Cranes-10 tons and under; Hydraulic Dredge; Hydro-Axe; Hydro Blaster; Jacks-Screw Air Hydraulic Power Operated Unit or Console Type (not hand Jack or Pile Load Test Type); Log Skidder; Pans; Pavers (all) concrete; Plate and Frame Filter Press; Pumpcrete Machines, Squeeze-crete & Concrete Pumping (regardless of size); Scrapers; Side Booms; "Straddle" Carrier-Ross and similar types; Winch Trucks (Hoisting); Whip Hammer

CLASS C: Asphalt Curbing Machine; Asphalt Plant Engineer; Asphalt Spreader; Autograde Tube Finisher and Texturing Machine (CMI & Similar types); Autograde Curecrete Machine (CMI & Similar Types); Autograde Curb Trimmer & Sidewalk, Shoulder, Slipform (CMI & Similar Types); Bar Bending Machines (Power); Batchers, Batching Plant and Crusher on Site; Belt Conveyor Systems; Boom Type Skimmer Machines; Bridge Deck Finisher; Bulldozer(except fine grade); Car Dumpers (Railroad); Compressor and Blower Type Units (used independently or mounted on dual purpose Trucks, on Job Site or in conjunction with jobsite, in Loading and Unloading of Concrete, Cement, Fly Ash, Instacrete, or Similar Type Materials); Compressors (2 or 3 in Battery); Concrete Finishing Machines; Concrete cleaning decontamination machine operator; Concrete Saws and Cutters (Ride-on type); Concrete Spreaders (Hetzl, Rexomatic and Similar Types); Concrete Vibrators; Conveyors (under 125 feet); Crushing Machines; Directional Boring Machines; Ditching Machine-small (Ditch-witch, Vermeer, or Similar type); Dope Pots (Mechanical with or without pump); Dumpsters; Elevator; Fireman; Fork Lifts (Economobile, Lull and Similar Types of Equipment); Front End Loaders (1 yd.and over but under 2 yds.); Generators (2 or 3 in Battery); Giraffe Grinders; Grout Pump; Gunnite Machines (excluding nozzle); Hammer Vibrator (in conjunction with Generator); Heavy Equipment Robotics Operator Technician; Hoists-Roof, Tugger, Aerial Platform Hoist & House Cars; Hoppers; Hopper Doors (power operated); Hydro Blaster; Hydraulic Jacking Trailer; Ladders (motorized); Laddervator; Locomotive-dinky type; Maintenance -Utility Man; Master Environmental Maintenance Technician; Mechanics; Mixers (Excepting Paving Mixers); Motor Patrols; Pavement Breakers (small self propelled ride on type-also maintains compressor hydraulic unit); Pavement Breaker-truck mounted; Pipe Bending Machine (Power); Pitch Pump; Plaster Pump (regardless of size); Post Hole Digger (Post Pounder & Auger); Rod Bending Machines (Power); Roller-Black Top; Scales (Power); Seaman pulverizing mixer; Shoulder widener; Silos; Skidsteer (all attachments); Skimmer Machines (boom-type); Steel Cutting Machine (service & maintain); Tam Rock Drill; Tractors; Transfer Machine; Captain (Power Boats); Tug Master (powerboats); Ultra High Pressure Waterjet Cutting Tool System operator/maintenance technician; Vacuum Blasting Machine; Vibrating Plants (used inconjunction with unloading); Welder and Repair Mechanics

CLASS D: Brooms and Sweepers; Chippers; Compressor (single); Concrete Spreaders (small type); Conveyor Loaders (not including Elevator Graders); Engines-large diesel (1620 HP) and Staging Pump; Farm Tractors; Fertilizing Equipment (Operation & Maint. of); Fine Grade Machine (small type); Form Line Graders (small type); Front End Loader (under 1 yard); Generator (single); Grease, Gas, Fuel and Oil supply trucks; Heaters (Nelson or other type incl. Propane, Natural Gas or Flowtype Units); Lights, Portable Generating Light Plants; Mixers (Concrete, small); Mulching Equipment (Operation and Maintenance of); Pumps (2 or less than 4 inch suction); Pumps (4 inch suction and over incl. submersible pumps); Pumps (Diesel Engine and Hydraulic-immaterial of power); Road Finishing Machines (small type); Rollers-grade, fill or stone base; Seeding Equip. (Operation and Maintenance of); Sprinkler & Water Pump Trucks (used on jobsite or in conjunction with jobsite); Steam Jennies and Boilers-irrespective of use; Stone Spreader; Tamping Machines, Vibrating Ride-on; Temporary Heating Plant (Nelson or other type, incl. Propane, Natural Gas or Flow Type Units); Water & Sprinkler Trucks (used on or in conjunction with jobsite); Welding Machines (Gas, Diesel, and/or Electric Converters of any type, single, two, or three in a battery); Wellpoint Systems (including installation by Bull Gang and Maintenance of)

CLASS E: Assistant Engineer/Oiler; Drillers Helper; Maintenance Apprentice (Deck Hand); Maintenance Apprentice (Oiler); Mechanics' Helper; Tire Repair and Maintenance; Transit/Instrument Man

WAGES:(per hour)

	07/01/2020	07/01/2021 Additional	07/01/2022 Additional
Class A5	\$ 61.32	\$ 2.30	\$ 2.25
Class A4	60.32		
Class A3	59.32		
Class A2	56.82		
Class A1	55.82		
Class A	54.82		
Class B	53.23		
Class C	51.32		
Class D	49.69		
Class E	47.98		
Safety Engineer	55.56		
**Outside Material Hoist (Class B) receives \$ 1.00 per hour on 110 feet up to 199 feet total height, \$ 2.00 per hour on 200 feet and over total height.			
Helicopter:			
Pilot/Engineer	56.64		
Co Pilot	54.82		
Communications Engineer	54.82		
Surveying:			
Chief of Party	54.82		
Transit/Instrument Man	47.98		
Rod/Chainman	45.40		
Additional \$0.75 for Survey work Tunnel under compressed air.			
Additional \$0.50 for Hydrographic work.			

- SHIFT WORK: On all Government mandated irregular or off shift work, an additional 15% on straight time hours.

- On HAZARDOUS WASTE REMOVAL or ASBESTOS REMOVAL work, or any state or federally DESIGNATED HAZARDOUS WASTE SITE:

For projects bid on or before April 1, 2020...Where the Operating Engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin and eye protection, the Operating Engineer shall receive the hourly wage plus an additional twenty percent (20%) of that wage for the entire shift.

For projects bid after April 1, 2020...On hazardous waste removal work of any kind, including state or federally designated site where the operating engineer is required to wear level A, B, or C personal protection the operating engineer shall receive an hourly wage rate of his regular hourly wage plus \$5.00 per hour. An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus \$ 1.00 per hour. This shall also apply to sites where the level D personal protection is required.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 34.35

SHIFT WORK: On all Government mandated irregular or off shift work, an additional 15% on straight time hours.

OVERTIME PAY

See (B, E, Q, *V, X) on OVERTIME PAGE

*15% premium is also required on shift work benefits

HOLIDAY

Paid: See (5, 6, 10, 13, 15) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 13, 15) on HOLIDAY PAGE

Holidays falling on Sunday will be celebrated on Monday.

REGISTERED APPRENTICES

(1) year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental Benefits per hour:

Apprentices \$ 34.35

11-825

Operating Engineer - Marine Dredging

08/01/2020

JOB DESCRIPTION Operating Engineer - Marine Dredging

DISTRICT 4

ENTIRE COUNTIES

Albany, Bronx, Cayuga, Chautauqua, Clinton, Columbia, Dutchess, Erie, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Niagara, Orange, Orleans, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

WAGES

These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour:	07/01/2020	10/01/2020
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	\$ 40.31	\$ 41.42
CLASS A2 Crane Operator (360 swing)	35.92	36.91
CLASS B Dozer, Front Loader Operator on Land	To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer,	34.86	35.82

Engineer, Chief Mate, Electrician,
Chief Welder, Maintenance Engineer
Licensed Boat, Crew Boat Operator

CLASS B2 Certified Welder	32.82	33.72
CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	31.92	32.80
CLASS C2 Boat Operator	30.89	31.74
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	25.66	26.37

SUPPLEMENTAL BENEFITS

Per Hour:

THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B	07/01/2020 \$11.58 plus 7.5% of straight time wage, Overtime hours add \$ 0.63	10/01/2020 \$11.98 plus 8% of straight time wage, Overtime hours add \$ 0.63
All Class C	\$11.28 plus 7.5% of straight time wage, Overtime hours add \$ 0.48	11.68 plus 8% of straight time wage, Overtime hours add \$ 0.48
All Class D	\$10.98 plus 7.5% of straight time wage, Overtime hours add \$ 0.33	11.38 plus 8% of straight time wage, Overtime hours add \$ 0.33

OVERTIME PAY

See (B2, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

Operating Engineer - Steel Erectors	08/01/2020
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JOB DESCRIPTION Operating Engineer - Steel Erectors

DISTRICT 11

ENTIRE COUNTIES

Delaware, Orange, Rockland, Sullivan, Ulster

WAGES

CLASS A3: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with a 140 ft. boom and over.

CLASS A2: Cranes, Derricks and Pile Drivers 100 tons or more and Tower Cranes, with up to a 139 ft. boom and under.

CLASS A1: Cranes, Derricks and Pile Drivers less than 100 tons with a 140 ft. boom and over.

CLASS A: Cranes, Derricks and Pile Drivers less than 100 tons with up to a 139 ft. boom and under.

CLASS B: "A" Frame; Cherry Pickers(10 tons and under); Hoists (all type Hoists, shall also include Steam, Gas, Diesel, Electric, Air Hydraulic, Single and Double Drum, Concrete, Brick Shaft Caisson, Snorkel Roof, and/or any other Similar Type Hoisting Machines, portable or stationary, except Chicago Boom Type); Jacks-Screw Air Hydraulic Power Operated Unit or Console Type (not hand Jack or Pile Load Test Type); Side Booms; Straddle Carrier

CLASS C: Aerial Platform used as Hoist; Compressors (2 or 3 in Battery); Concrete cleaning/ decontamination machine operator; Directional Boring Machines; Elevator or House Cars; Conveyers and Tugger Hoists; Fireman; Fork Lifts; Generators (2 or 3 in Battery); Heavy Equipment Robotics Operator/Technician; Master Environmental Maintenance Technician; Maintenance -Utility Man; Rod Bending Machines (Power); Captain(powerboat); Tug Master; Ultra High Pressure Waterjet Cutting Tool System; Vacuum Blasting Machine; Welding Machines(gas or electric,2 or 3 in battery, including diesels); Transfer Machine; Apprentice Engineer/Oiler with either one compressor or one welding machine when used for decontamination and remediation

CLASS D: Compressor (single); Welding Machines (Gas, Diesel, and/or Electric Converters of any type); Welding System Multiple (Rectifier Transformer type)

CLASS E: Assistant Engineer/Oiler; Maintenance Apprentice (Deck Hand);Drillers Helper; Maintenance Apprentice (Oiler); Mechanics' Helper; Transit/Instrument Man

WAGES:(per hour)

	07/01/2020	07/01/2021 Additional	07/01/2022 Additional
Class A3	\$ 63.34	\$ 2.30	\$ 2.25
Class A2	61.68		
Class A1	58.84		
Class A	57.18		
Class B	54.39		
Class C	51.73		
Class D	50.20		
Class E	48.44		
Vacuum Truck	55.15		
Safety Engineer	56.01		

Helicopter:

Pilot/Engineer	58.84
Co Pilot	58.45
Communications Engineer	58.45

Surveying:

Chief of Party	55.15
Transit/Instrument man	48.44
Rod/Chainman	45.40

Additional \$0.75 for Survey work Tunnels under compressed air.

Additional \$0.50 for Hydrographic work.

- SHIFT WORK: On all Government mandated irregular or off shift work, an additional 15% on straight time hours.

- On HAZARDOUS WASTE REMOVAL or ASBESTOS REMOVAL work, or any state or federally DESIGNATED HAZARDOUS WASTE SITE:

For projects bid on or before April 1, 2020...Where the Operating Engineer is in direct contact with hazardous material and when personal protective equipment is required for respiratory, skin and eye protection, the Operating Engineer shall receive the hourly wage plus an additional twenty percent (20%) of that wage for the entire shift.

For projects bid after April 1, 2020...On hazardous waste removal work of any kind, including state or federally designated site where the operating engineer is required to wear level A, B, or C personal protection the operating engineer shall receive an hourly wage rate of his regular hourly wage plus \$5.00 per hour. An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus \$ 1.00 per hour. This shall also apply to sites where the level D personal protection is required.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 34.35
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OVERTIME PAY

See (B, E, Q, *V, X) on OVERTIME PAGE

*15% premium is also required on shift work benefits

HOLIDAY

Paid: See (5, 6, 10, 13, 15) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 13, 15) on HOLIDAY PAGE

Holidays falling on Sunday will be celebrated on Monday.

REGISTERED APPRENTICES

(1) year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental Benefits per hour:

Apprentices \$ 34.45

11-825SE

Painter	08/01/2020
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JOB DESCRIPTION Painter

DISTRICT 1

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Sullivan, Ulster

WAGES

Per hour

07/01/2020

Brush/Paper Hanger	\$ 35.14
Dry Wall Finisher	35.14
Lead Abatement	35.14
Sandblaster-Painter	35.14
Spray Rate	36.14

See Bridge Painting rates for the following work:

Structural Steel , all work performed on tanks, ALL BRIDGES, towers, smoke stacks, flag poles. Rate shall apply to all of said areas from the ground up.

SUPPLEMENTAL BENEFITS

Per hour

Journey person \$ 24.04

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED SHIFT(S) OR SINGULAR IRREGULAR SHIFT OF AT LEAST A FIVE (5) DAY DURATION (MONDAY THROUGH FRIDAY), WHEN THE SHIFT STARTS BETWEEN THE HOURS LISTED BELOW:

4:00 PM to 6:30 AM REGULAR RATE PLUS 15%**

OVERTIME ON MULTIPLE SHIFT WORK AND SINGULAR IRREGULAR SHIFT THE SHIFT RATE IS THE BASE RATE

**SHIFT RATE STOPS AFTER 6:30AM

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour

Six (6) month terms at the following percentage of Journey person's wage

1st	2nd	3rd	4th	5th	6th
40%	50%	60%	70%	80%	90%

Supplemental Benefits per hour worked

1st term \$ 10.64
All others 24.04

1-155

Painter - Bridge & Structural Steel	08/01/2020
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JOB DESCRIPTION Painter - Bridge & Structural Steel

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per Hour:

STEEL:

Bridge Painting:	07/01/2020	10/01/2020	10/01/2021
	\$ 50.25	\$ 51.50	\$ 53.00
	+ 7.88*	+ 8.63*	+ 9.63*

ADDITIONAL \$6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:	07/01/2020	10/01/2020	10/01/2021
	\$ 10.20	\$ 10.90	\$ 10.90
	+ 29.65*	+ 30.00*	+ 30.60*

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (4, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage - Per hour:

Apprentices: (1) year terms

	07/01/2020	10/01/2020	10/01/2021
1st year	\$ 20.10	\$ 20.60	\$ 21.20
	+ 3.15*	+ 3.45*	+ 3.86*
2nd year	\$ 30.15	\$ 30.90	\$ 31.80
	+ 4.73*	+ 5.18*	+ 5.78*
3rd year	\$ 40.20	\$ 41.20	\$ 42.40
	+ 6.30*	+ 6.90*	+ 7.71*
Supplemental Benefits - Per hour:			
1st year	\$.25	\$.25	\$.25
	+ 11.86*	+ 12.00*	+ 12.24*
2nd year	\$ 10.20	\$ 10.90	\$ 10.90
	+ 17.79*	+ 18.00*	+ 18.36*
3rd year	\$ 10.20	\$ 10.90	\$ 10.90
	+ 23.72*	+ 24.00*	+ 24.48*

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Line Striping	08/01/2020
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JOB DESCRIPTION Painter - Line Striping

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per hour:

Painter (Striping-Highway):	07/01/2020	07/01/2021	07/01/2022
Striping-Machine Operator*	\$ 30.10	\$ 30.32	\$ 31.53
Linerman Thermoplastic	\$ 36.53	\$ 36.93	\$ 38.34

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day.

NOTE - In order to use the '4 Day/10 Hour Work Schedule,' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour paid:	07/01/2020	07/01/2021	07/01/2022
Journeyworker:			
Striping Machine Operator:	\$ 9.16	\$ 10.03	\$ 10.03
Linerman Thermoplastic:	\$ 9.16	\$ 10.03	\$ 10.03

OVERTIME PAY

See (B, B2, E2, F, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 20) on HOLIDAY PAGE
Overtime: See (5, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rates:

	07/01/2020	07/01/2021	07/01/2022
1st Term:	\$ 12.04	\$ 12.12	\$ 12.61
2nd Term:	\$ 18.06	\$ 18.19	\$ 19.82
3rd Term:	\$ 24.08	\$ 24.26	\$ 25.22

Supplemental Benefits per hour:

1st term:	\$ 9.16	\$ 10.03	\$ 10.03
2nd Term:	\$ 9.16	\$ 10.03	\$ 10.03
3rd Term:	\$ 9.16	\$ 10.03	\$ 10.03

8-1456-LS

Painter - Metal Polisher	08/01/2020
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JOB DESCRIPTION Painter - Metal Polisher

DISTRICT 8

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

	07/01/2020
Metal Polisher	\$ 36.33
Metal Polisher*	37.43
Metal Polisher**	40.33

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2020
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Journeyworker:	
All classification	\$ 9.94

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid:	See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE
Overtime:	See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

	07/01/2020
1st year	\$ 16.00
2nd year	17.00
3rd year	18.00
1st year*	\$ 16.39
2nd year*	17.44
3rd year*	18.54
1st year**	\$ 18.50
2nd year**	19.50
3rd year**	20.50

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:

Per hour:

1st year	\$ 6.69
2nd year	6.69
3rd year	6.69

8-8A/28A-MP

Plumber

08/01/2020

JOB DESCRIPTION Plumber

DISTRICT 11

ENTIRE COUNTIES

Orange, Rockland, Sullivan

PARTIAL COUNTIES

Ulster: Only the Townships of Plattekill, Marlboro, Wawarsing, and Shawangunk (except for Wallkill and Shawangunk Prisons).

WAGES

REFRIGERATION: For commercial and industrial refrigeration which means service, maintenance, and installation work where the combined compressor tonnage does not exceed 40 tons.

AIR CONDITIONING: Air conditioning to be installed that is water cooled shall not exceed 25 tons. This will include the piping of the component system and erection of water tower. Air conditioning that is air cooled shall not exceed 50 tons.

WAGES: (per hour)

	07/01/2020	05/01/2021 Additional
Plumber	\$ 34.59	\$ 2.00

Star Certification: an additional \$ 1.00 per hour over scale will be paid to all those who have Star Certification.

Shift Differential: When mandated by the governmental agency, an additional 15% premium will be paid for irregular work day or for 2nd and 3rd shift.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman

\$ 33.07*

*For overtime or shift differential work, \$0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

OVERTIME PAY

See (B, G, P, *V) on OVERTIME PAGE

* A portion of the benefit amount is subject to the V code for overtime and shift differential work.

HOLIDAY

Paid: See (5, 6, 13, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 13, 15, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following wage.

	07/01/2020
1st term	\$ 12.11
2nd term	15.57
3rd term	19.03
4th term	22.49
5th term	27.68

Supplemental Benefits per hour:
Apprentices

1st term	\$ 11.66*
2nd term	14.96*
3rd term	18.25*
4th term	21.55*
5th term	26.49*

*For overtime or shift differential work, \$0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

11-373 Refrig

Plumber	08/01/2020
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JOB DESCRIPTION Plumber

DISTRICT 11

ENTIRE COUNTIES

Orange, Rockland, Sullivan

PARTIAL COUNTIES

Ulster: Only the Townships of Plattekill, Marlboro, Wawarsing, and Shawangunk (except for Wallkill and Shawangunk Prisons).

WAGES

WAGES:(per hour)	07/01/2020	05/01/2021 Additional
Plumber/Steamfitter	\$ 46.70	\$ 2.50

Note: For all work 40-60 feet above ground add \$ 0.25 per hour, over 60 feet add \$ 0.50 per hour.

Shift Differential: When mandated by the governmental agency, an additional 15% premium will be paid for irregular work day or for 2nd and 3rd shift.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman

\$ 40.82*

*For overtime or shift differential work, \$0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

OVERTIME PAY

See (B, E, Q, *V) on OVERTIME PAGE

* A portion of the benefit amount is subject to the V code for overtime and shift differential work.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

When a holiday falls on a Saturday, the day prior shall be considered and recognized as the holiday. When a holiday falls on a Sunday, the day proceeding shall be considered and recognized as the holiday to be observed.

REGISTERED APPRENTICES

(1) year terms at the following wages.

	07/01/2020
1st term	\$ 16.35
2nd term	21.02
3rd term	25.69
4th term	30.36
5th term	37.36

Supplemental Benefits per hour:

1st term	\$ 14.37*
2nd term	18.44*
3rd term	22.50*
4th term	26.58*
5th term	32.67*

*For overtime or shift differential work, \$0.10 is paid at straight time, the remaining balance is paid at the same premium as the wages.

11-373 SF

Plumber

08/01/2020

JOB DESCRIPTION Plumber

DISTRICT 8

ENTIRE COUNTIES

Dutchess

PARTIAL COUNTIES

Delaware: Only the Townships of Middletown and Roxbury.

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour:	07/01/2020
Plumber & Steamfitter	\$ 52.48

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:	\$ 38.53
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OVERTIME PAY

See (B, E, E2, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following rates:

	07/01/2020
1st year	\$ 19.96
2nd year	27.65
3rd year	32.09
4th year	38.53
5th year	44.44

Supplemental Benefits per hour:

1st year	\$ 16.39
2nd year	20.90
3rd year	24.26
4th year	27.99
5th year	30.80

8-21.2-SF

Plumber - HVAC / Service**08/01/2020****JOB DESCRIPTION** Plumber - HVAC / Service**DISTRICT 8****ENTIRE COUNTIES**

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Delaware: Only the townships of Middletown and Roxbury

Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2020

HVAC Service \$ 39.68
+ \$ 4.32*

*Note: This portion of wage is not subject to overtime premium.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2020

Journeyworker HVAC Service

\$ 25.14

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

HVAC SERVICE

(1)year terms at the following wages:

07/01/2020				
1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
\$ 18.05	\$ 21.33	\$ 26.66	\$ 32.76	\$ 35.46
+\$2.37*	+\$2.67*	+\$3.22*	+\$3.84*	+\$4.07*

*Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices 07/01/2020

1st term	\$ 19.03
2nd term	20.09
3rd term	21.30
4th term	22.90
5th term	24.07

8-21.1&2-SF/Re/AC

Plumber - Jobbing & Alterations**08/01/2020****JOB DESCRIPTION** Plumber - Jobbing & Alterations**DISTRICT 8****ENTIRE COUNTIES**

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2020
Journeyworker: \$ 44.91

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:
Journeyworker \$ 31.60

OVERTIME PAY

See (B, *E, E2, Q, V) on OVERTIME PAGE

*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wages:

1st year	\$ 19.52
2nd year	21.65
3rd year	23.42
4th year	32.92
5th year	34.76

Supplemental Benefits per hour:

1st year	\$ 10.21
2nd year	12.05
3rd year	15.88
4th year	21.42
5th year	23.29

8-21.3-J&A

Roofer

08/01/2020

JOB DESCRIPTION Roofer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2020
Roofer/Waterproofer \$ 44.25
+ \$7.00*

* This portion is not subject to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS

Per Hour: \$ 27.87

OVERTIME PAY

See (B, H) on OVERTIME PAGE

Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year term

1st	2nd	3rd	4th
\$ 15.49	\$ 22.13	\$ 26.55	\$ 33.19
	+ 3.00*	+ 4.20*	+ 5.26*

Supplements:

1st	2nd	3rd	4th
\$ 3.57	\$ 14.10	\$ 16.85	\$ 20.98

9-8R

Sheetmetal Worker

08/01/2020

JOB DESCRIPTION Sheetmetal Worker

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

	07/01/2020
SheetMetal Worker	\$ 43.65
	+ 3.27*

*This portion is not subject to overtime premiums.

SHIFT WORK

For all NYS D.O.T. and other Governmental mandated off-shift work:

10% increase for additional shifts for a minimum of five (5) days

SUPPLEMENTAL BENEFITS

Journeyworker	\$ 42.55
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OVERTIME PAY

OVERTIME: See (B, E, Q,) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 16.16	\$ 18.18	\$ 20.21	\$ 22.23	\$ 24.24	\$ 26.27	\$ 28.77	\$ 31.27
+ 1.31*	+ 1.47*	+ 1.64*	+ 1.80*	+ 1.96*	+ 2.13*	+ 2.29*	+ 2.45*

*This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices

1st term	\$ 18.31
2nd term	20.60
3rd term	22.88
4th term	25.19
5th term	27.47
6th term	29.75
7th term	31.56
8th term	33.39

8-38

Sprinkler Fitter

08/01/2020

JOB DESCRIPTION Sprinkler Fitter

DISTRICT 1

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

Per hour	07/01/2020
Sprinkler	\$ 45.52
Fitter	

SUPPLEMENTAL BENEFITS

Per hour

Journey person \$ 27.57

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES

Wages per hour

One Half Year terms at the following percentage of journey person's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 21.97	\$ 24.41	\$ 26.59	\$ 29.02	\$ 31.45	\$ 33.88	\$ 36.31	\$ 38.74	\$ 41.17	\$ 43.60

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.27	\$ 8.27	\$ 18.70	\$ 18.70	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95	\$ 18.95
									1-669.2

Teamster - Building / Heavy&Highway

08/01/2020

JOB DESCRIPTION Teamster - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Dutchess, Orange, Rockland, Sullivan, Ulster

WAGES

GROUP 1: LeTourneau Tractors, Double Barrel Euclids, Athney Wagons and similar equipment (except when hooked to scrapers), I-Beam and Pole Trailers, Tire Trucks, Tractor and Trailers with 5 axles and over, Articulated Back Dumps and Road Oil Distributors, Articulated Water Trucks and Fuel Trucks/Trailers, positions requiring a HAZMAT CDL endorsement.

GROUP 1A: Drivers on detachable Gooseneck Low Bed Trailers rated over 35 tons.

GROUP 2: All equipment 25 yards and up to and including 30 yard bodies and cable Dump Trailers and Powder and Dynamite Trucks.

GROUP 3: All Equipment up to and including 24-yard bodies, Mixer Trucks, Dump Crete Trucks and similar types of equipment, Fuel Trucks, Batch Trucks and all other Tractor Trailers, Hi-Rail Truck.

GROUP 4: Tri-Axles, Ten Wheelers, Grease Trucks, Tillerman, Pattern Trucks, Attenuator Trucks. Water Trucks, Bus.

GROUP 5: Straight Trucks.

GROUP 6: Pick-up Trucks for hauling materials and parts, and Escort Man over-the-road.

WAGES: (per hour) 07/01/2020

GROUP 1	\$ 33.25
GROUP 1A	34.39
GROUP 2	32.69
GROUP 3	32.47
GROUP 4	32.36
GROUP 5	32.24
GROUP 6	32.24

NOTE ADDITIONAL PREMIUMS:

- On projects requiring an irregular shift a premium of 10% will be paid on wages. The premium will be paid for off-shift or irregular shift work when mandated by Governmental Agency.

- Employees engaged in hazardous/toxic waste removal, on a State or Federally designated hazardous/toxic waste site, where the employee comes in contact with hazardous/toxic waste material and when personal protective equipment is required for respiratory, skin, or eye protection, the employee shall receive an additional 20% premium above the hourly wage.

SUPPLEMENTAL BENEFITS

Per hour:

First 40 hours \$ 35.55

Over 40 hours 28.75

OVERTIME PAY

See (*B, E, **P, X) on OVERTIME PAGE

*Holidays worked Monday through Friday receive Double Time (2x) after 8 hours.

**Sunday Holidays are paid at a rate of double time and one half (2.5x) for all hours worked.

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE

Overtime: See (*1) on HOLIDAY PAGE

*See OVERTIME PAY section for when additional premium is applicable on Holiday hours worked.

11-445B/HH

Welder

08/01/2020

JOB DESCRIPTION Welder

DISTRICT 1

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2020

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

- (1) None
- (2) Labor Day
- (3) Memorial Day and Labor Day
- (4) Memorial Day and July 4th
- (5) Memorial Day, July 4th, and Labor Day
- (6) New Year's, Thanksgiving, and Christmas
- (7) Lincoln's Birthday, Washington's Birthday, and Veterans Day
- (8) Good Friday
- (9) Lincoln's Birthday
- (10) Washington's Birthday
- (11) Columbus Day
- (12) Election Day
- (13) Presidential Election Day
- (14) 1/2 Day on Presidential Election Day
- (15) Veterans Day
- (16) Day after Thanksgiving
- (17) July 4th
- (18) 1/2 Day before Christmas
- (19) 1/2 Day before New Years
- (20) Thanksgiving
- (21) New Year's Day
- (22) Christmas
- (23) Day before Christmas
- (24) Day before New Year's
- (25) Presidents' Day
- (26) Martin Luther King, Jr. Day
- (27) Memorial Day
- (28) Easter Sunday



New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12240

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One)

☐

Contracting Agency

☐

Architect or Engineering Firm

☐

Public Work District Office

Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address ☐ (Check if new or change)

Telephone: ()

Fax: ()

E-Mail:

2. NY State Units (see Item 5)

☐ 01 DOT

☐ 02 OGS

☐ 03 Dormitory Authority

☐ 04 State University
Construction Fund

☐ 05 Mental Hygiene
Facilities Corp.

☐ 06 OTHER N.Y. STATE UNIT

☐ 07 City

☐ 08 Local School District

☐ 09 Special Local District, i.e.,
Fire, Sewer, Water District

☐ 10 Village

☐ 11 Town

☐ 12 County

☐ 13 Other Non-N.Y. State
(Describe)

3. SEND REPLY TO ☐ (check if new or change)
Name and complete address:

Telephone:()

Fax: ()

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

☐ New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

☐ Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR
THIS PROJECT :

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- ☐ 1. New Building
- ☐ 2. Addition to Existing Structure
- ☐ 3. Heavy and Highway Construction (New and Repair)
- ☐ 4. New Sewer or Waterline
- ☐ 5. Other New Construction (Explain)
- ☐ 6. Other Reconstruction, Maintenance, Repair or Alteration
- ☐ 7. Demolition
- ☐ 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- ☐ Construction (Building, Heavy Highway/Sewer/Water)
- ☐ Tunnel
- ☐ Residential
- ☐ Landscape Maintenance
- ☐ Elevator maintenance
- ☐ Exterminators, Fumigators
- ☐ Fire Safety Director, NYC Only
- ☐ Guards, Watchmen
- ☐ Janitors, Porters, Cleaners, Elevator Operators
- ☐ Moving furniture and equipment
- ☐ Trash and refuse removal
- ☐ Window cleaners
- ☐ Other (Describe)

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding? YES ☐ NO ☐

10. Name and Title of Requester

Signature

NYSDOL Bureau of Public Work Debarment List 07/28/2020

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	NYC	*****9839	A.J.S. PROJECT MANAGEMENT, INC.		149 FIFTH AVENUE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL	*****3344	ACT INC		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	*****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC	*****6775	ADVENTURE MASONRY CORP.		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC		AGOSTINHO TOME		405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	DOL		AJ TORCHIA		10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	DOL	*****3344	ALL CATASTROPHE CONSTRUCTION TEAM INC	ACT INC	6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL		AMADEO J TORCHIA	TORCHIA'S HOME IMPROVEMENT	10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	NYC		AMJAD NAZIR		2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	DOL		ANGELO F COKER			12/04/2018	12/04/2023
DOL	NYC		ANISUL ISLAM		C/O RELIANCE GENERAL CONS 644 OCEAN PARKWAYBROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	NYC		ANTHONY J SCLAFANI		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL		ANTHONY PERGOLA		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10323	01/23/2017	01/23/2022
DOL	DOL		ANTONIO ESTIVEZ		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3020	APCO CONTRACTING CORP		24 SOUTH MARYLAND AVENUE PORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DOL		ARVINDER ATWAL		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	*****4779	ASTORIA GENERAL CONTRACTING CORP		35-34 31ST STREET LONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	NYC	*****7217	ASTRO COMMUNICATIONS OF NY CORP		79 ALEXANDER AVE- STE 36A BRONX NY 10454	10/30/2015	10/30/2020
DOL	NYC	*****6683	ATLAS RESTORATION CORP.		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022
DOL	NYC	*****5532	ATWAL MECHANICALS, INC		65 KENNETH PLACE NEW HYDE PARK NY 11040	07/19/2017	07/19/2022
DOL	NYC	*****2591	AVI 212 INC.		260 CROPEY AVENUE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	AG		AVTAR SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	AG		BALDEV SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL		BARRY KINNEY		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020

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DOL	NYC	*****3915	BEACON RESTORATION INC		SUITE B-8 782 PELHAM PARKWAY SOUTHBRONX NY 10462	04/21/2016	04/21/2021
DOL	NYC	*****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		BIAGIO CANTISANI			06/12/2018	06/12/2023
DOL	DOL	*****4512	BOB BRUNO EXCAVATING, INC		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BOGDAN MARKOVSKI		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	*****8551	BRANDY'S MASONRY		216 WESTBROOK STREET P O BOX 304SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL	*****1449	BRRESTORATION NY INC		140 ARCADIA AVENUE OSWEGO NY 13126	09/12/2016	09/12/2021
DOL	DOL		BRUCE MORSEY		C/O KENT HOLLOW SIDING LL 29A BRIDGE STREETNEW MILFORD CT 06776	01/15/2016	01/15/2021
DOL	DOL		BRUCE P. NASH JR.		5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****0225	C&D LAFACE CONSTRUCTION, INC.		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****8809	C.B.E. CONTRACTING CORPORATION		310 MCGUINESS BLVD GREENPOINT NY 11222	03/07/2017	03/07/2022
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CANTISANI HOLDING LLC			06/12/2018	06/12/2023
DOL	DOL		CARIBBEAN POOLS		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL		CARMEN RACHETTA		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	02/03/2025
DOL	DOL		CARMENA RACHETTA		8531 OSWEGO ROAD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3812	CARMODY "2" INC			06/12/2018	06/12/2023
DOL	DOL	*****1143	CARMODY BUILDING CORP	CARMODY CONTRACTIN G AND CARMODY CONTRACTIN G CORP.	442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY CONCRETE CORPORATION			06/12/2018	06/12/2023
DOL	DOL		CARMODY ENTERPRISES, LTD.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY INC		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3812	CARMODY INDUSTRIES INC			06/12/2018	06/12/2023
DOL	DOL		CARMODY MAINTENANCE CORPORATION		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY MASONRY CORP		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****8809	CBE CONTRACTING CORP		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	AG		CESAR J. AGUDELO		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL	*****7655	CHAMPION CONSTRUCTION SERVICES CORP		2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		CHARLES ZIMMER JR		216 WESTBROOK STREET P O BOX 304SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL		CHRISTINE J HEARNE		C/O CJ-HEARNE CONSTRUCTIO 131 PONCE DE LEON AVE NEATLANTA GA 30308	12/01/2015	12/01/2020
DOL	DOL		CHRISTOPHER J MAINI		19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023

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DOL	DOL		CHRISTOPHER PAPASTEFANOU A/K/A CHRIS PAPASTEFANOU		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	*****0671	CJ-HEARNE CONSTRUCTION CO		SUITE 204 131 PONCE DE LEON AVENUEATLANTA GA 30308	12/01/2015	12/01/2020
DOL	DOL	*****1927	CONSTRUCTION PARTS WAREHOUSE, INC.	CPW	5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	NYC	*****2164	CREATIVE TRUCKING INC		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	DOL	*****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	DOL	*****7761	D L MALARKEY CONSTRUCTION		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****7888	D L MALARKEY CONSTRUCTION INC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****5629	DAKA PLUMBING AND HEATING LLC		2561 ROUTE 55 POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	NYC		DALJIT KAUR BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL		DANICA IVANOSKI		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		DAVID MARTINEZ		C/O EMPIRE TILE INC 6 TREMONT COURTHUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DEBBIE STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	AG		DEBRA MARTINEZ		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		DEDA GAZIVODAN		C/O DAKA PLUMBING AND H 2561 ROUTE 55POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		DENNIS SCHWANDTNER		C/O YES SERVICE AND REPAIR 145 LODGE AVEHUNTINGTON STATION NY 11476	08/09/2016	08/09/2021
DOL	DOL		DF CONTRACTORS OF ROCHESTER, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DF CONTRACTORS, INC.		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	NYC		DIMITRIOS KOUTSOUKOS		C/O ASTORIA GENERAL CONTR 35-34 31ST STREETLONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	NYC		DIMITRIOS TSOUMAS		35-12 19TH AVENUE ASTORIA NY 11105	08/02/2017	08/02/2022
DOL	DOL		DOMENICO LAFACE		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3242	DONALD R. FORSAY	DF LAWN SERVICE	1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DONALD R. FORSAY		1835 DAANSEN RD. PALMYRA NY 14522	05/16/2017	05/16/2022
DOL	DOL		DORIS SKODA		C/O APCO CONTRACTING CORP 24 SOUTH MARYLAND AVENUEPORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	NYC	*****7404	DOSANJH CONSTRUCTION CORP		9439 212TH STREET QUEENS VILLAGE NY 11428	02/25/2016	02/25/2021
DOL	DOL		DOUGLAS L MALARKEY	MALARKEY CONSTRUCTI ON	64 VICTORIA DRIVE B INGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	NYC		DUARTE LOPES		66-05 WOODHAVEN BLVD. STE 2REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DOL		E C WEBB		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025

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DOL	DOL		EARL L WILSON	WILSON BROTHER DRYWALL CONTRACTOR S	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL		EAST COAST PAVING		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	NYC	*****4269	EAST PORT EXCAVATION & UTILITIES		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	DOL	*****3270	EMPIRE TILE INC		6 TREMONT COURT HUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	NYC	*****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL	*****7403	F & B PAINTING CONTRACTING INC		2 PARKVIEW AVENUE HARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		FAY MATTHEW		C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUEBROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		FAZIA GINA ALI-MOHAMMED	C/O CHAMPION CONSTRUCTI ON	2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		FRANK BENEDETTO		19 CATLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		FRANK BENEDETTO		C/O F & B PAINTING CONTRA 2 PARKVIEW AVENUEHARRISON NY 10604	09/26/2016	09/26/2021
DOL	DOL	*****4722	FRANK BENEDETTO AND CHRISTOPHER J MAINI	B & M CONCRETE	19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	NYC		FRANK MAINI		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	NYC	*****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	DOL		GALINDA ROTENBERG		C/O GMDV TRANS INC 67-48 182ND STREETFRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	DOL		GEOFF CORLETT		415 FLAGGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		GIOVANNI LAFACE		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	NYC	*****3164	GLOBE GATES INC	GLOBAL OVERHEAD DOORS	405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	DOL	*****5674	GMDV TRANS INC		67-48 182ND STREET FRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	NYC		GREAT ESTATE CONSTRUCTION, INC.		327 STAGG ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	DOL		GREGORY S. OLSON		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		HARMEL SINGH		15 CLINTON LANE HICKSVILLE NY 11801	02/25/2016	02/25/2021
DOL	NYC		HAROLD KUEMMEL		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	NYC	*****3228	HEIGHTS ELEVATOR CORP.		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	DOL		HENRY VAN DALRYMPLE		2663 LANTERN LANE ATLANTA GA 30349	12/01/2015	12/01/2020
DOL	DOL	*****8282	IDEMA DEVELOPMENT INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020

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DOL	DOL	*****8282	IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL	*****7001	INTEGRATED CONSTRUCTION & POWER SYSTEMS INC		SUITE 100 2105 W GENESEE STREETS YRACUSE NY 13219	01/06/2016	01/06/2021
DOL	DOL	*****5131	INTEGRITY MASONRY, INC.	M&R CONCRETE	722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	AG		J A M CONSTRUCTION CORP		SUITE 125 265 SUNRISE HIGHWAY ROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		J.A. HIRES CADWALLADER		P.O BOX 100 200 LATT BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JAMES B RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JAMES C. DELGIACCO		722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		JAMES E RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	AG		JAMES FALCONE		SUITE 125 265 SUNRISE HIGHWAY ROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		JAMES LIACONE		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RACHEL		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RHYNDERS SR		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JASON W MILLIMAN		C/O ROCHESTER ACOUSTICAL P O BOX 799 HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL	*****5368	JCH MASONRY & LANDSCAPING INC.		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JESSICA WHITESIDE		C/O BRRESTORATION NY INC 140 ARCADIA AVENUE OSWEGO NY 13126	09/12/2016	09/12/2021
DOL	AG		JOHN ANTHONY MASSINO		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JOHN F. CADWALLADER		200 LATT BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	*****4612	JOHN F. CADWALLADER, INC.	THE GLASS COMPANY	P.O BOX 100 200 LATT BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	AG	*****0600	JOHNCO CONTRACTING, INC.		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296 EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296 EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302 STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSE CHUCHUCA		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	AG		JOSEPH FALCONE		SUITE 125 265 SUNRISE HIGHWAY ROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	NYC		JOSEPH FOLEY		66-05 WOODHAVEN BLVD. STE 2 REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DOL	*****9273	JOSEPH M LOVETRO		P O BOX 812 BUFFALO NY 14220	08/09/2016	08/09/2021
DOL	NYC		JOSEPH MARTINO		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	DOL		JOY MARTIN		2404 DELAWARE AVE NIGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002

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DOL	DOL	*****5062	K R F SITE DEVELOPMENT INC		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	NYC		K.S. CONTRACTING CORP.		29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	DOL		KATIE BURDICK		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		KENNETH FIORENTINO		375 LAKE SHORE DRIVE PUTNAM VALLEY NY 10579	01/23/2017	01/23/2022
DOL	DOL	*****9732	KENT HOLLOW SIDING LLC		29A BRIDGE STREET NEW MILFORD CT 06776	01/15/2016	01/15/2021
DOL	DOL		KIM SOROCENSKI		C/O SOLUTION MATTERS INC 198 NORWOOD ROADPORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL	*****3490	L & M CONSTRUCTION/DRYWALL INC.		1079 YONKERS AVE YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	AG	*****4643	LALO DRYWALL, INC.		221 OLD FORD ROAD NEW PLATZ NY 12561	05/20/2016	05/20/2021
DOL	DOL	*****4505	LARAPINTA ASSOCIATES INC		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		LAVERN GLAVE		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	06/24/2016	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL	*****4388	LEN.J CONSTRUCTION, LLC		PO BOX 10007 ALBANY NY 12201	08/14/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	09/19/2017	09/19/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	08/14/2017	08/14/2022
DOL	DOL		LEROY NELSON JR		PO BOX 10007 ALBANY NY 12201	01/17/2017	09/19/2022
DOL	DA	*****4460	LONG ISLAND GLASS & STOREFRONTS, LLC		4 MANHASSET TRL RIDGE NY 11961	09/06/2018	09/06/2023
DOL	AG	*****4216	LOTUS-C CORP.		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	AG		LUIS MARTINEZ	LALO DRYWALL	211 MAIN ST. NEW PALTZ NY 12561	05/20/2016	05/20/2021
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL		M ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	AG	*****6957	M B DIN CONSTRUCTION INC		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	DOL		M. ANVER BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	NYC	*****9590	MACK GLASSNAUTH IRON WORKS INC		137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020
DOL	DOL	*****1784	MADISON AVE CONSTRUCTION CORP		39 PENNY STREET WEST ISLIP NY 11795	11/02/2016	11/02/2021

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DOL	DOL		MALARKEY'S BAR & GRILL LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****0705	MALARKEY'S PUB & GRUB LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MAREK FABIJANOWSKI		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		MARIACHI'S PIZZERIA		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL		MARK MIONIS		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	NYC		MARTINE ALTER		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		MARVIN A STURDEVANT		29 MAPLEWOOD DRIVE BINGHAMTON NY 13901	02/21/2017	02/21/2022
DOL	DOL		MASONRY CONSTRUCTION, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3333	MASONRY INDUSTRIES, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		MATINA KARAGIANNIS		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2023
DOL	DOL		MATTHEW IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL		MAURICE GAWENO		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****6416	MCCALL MASONRY		P O BOX 304 SAYRE PA 18840	08/09/2016	08/09/2021
DOL	DOL		MCLEAN "MIKKI BEANE"		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN "MIKKI" DRAKE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		MCLEAN M DRAKE-BEANE		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSIONAL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL	*****9445	MCLEAN M WALSH	ELITE PROFESSIONAL PAINTING OF CNY	1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	NYC	*****5330	METRO DUCT SYSTEMS INC		1219 ASTORIA BOULEVARD LONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	DOL		MICHAEL A PASCARELLA		SUITE 100 2105 WEST GENESEE STREET SYRACUSE NY 13219	01/06/2016	01/06/2021
DOL	NYC		MICHAEL HIRSCH		C/O MZM CORP 163 S MAIN STREETNEW CITY NY 10956	01/28/2016	01/28/2021
DOL	DOL		MICHAEL LENIHAN		1079 YONKERS AVE UNIT 4YONKERS NY 10704	08/07/2018	08/07/2023
DOL	AG		MICHAEL RIGLIETTI		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		MICHAEL WILSON	WILSON BROTHER DRYWALL CONTRACTORS	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL	*****4829	MILESTONE ENVIRONMENTAL CORPORATION		704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	*****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	*****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	AG		MOHAMMED N CHATHA		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	DOL	*****2737	MOUNTAIN'S AIR INC		2471 OCEAN AVENUE- STE 7A BROOKLYN NY 11229	09/24/2012	09/18/2020

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DOL	NYC	*****3826	MOVING MAVEN OF NY, INC.		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	NYC	*****3550	MOVING MAVEN, INC		1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	AG		MSR ELECTRICAL CONSTRUCTION CORP.		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		MUHAMMAD BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		MUHAMMAD BEIG		142 EAST MARKET STREET LONG BEACH NY 11561	03/07/2017	03/07/2022
DOL	DOL		MUHAMMAD PERVAIZ		C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUEBROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	NYC	*****3613	MZM CORP		163 S MAIN STREET NEW CITY NY 10956	01/28/2016	01/28/2021
DOL	DA	*****9786	NATIONAL INSULATION & GC CORP		180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	NYC	*****4839	NEW YORK RIGGING CORP		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	NYC		NICHOLAS FILIPAKIS		7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	*****6966	NORTH COUNTRY DRYWALL AND PAINT		23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	*****0065	NORTHEAST LANDSCAPE AND MASONRY ASSOC		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL	*****1845	OC ERECTERS, LLC A/K/A OC ERECTERS OF NY INC.		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	NYC	*****0818	ONE TEN RESTORATION, INC.		2366 61ST ST BROOKLYN NY 11204	12/15/2016	12/15/2021
DOL	NYC		ORSON ARROYO		C/O METRO DUCT SYSTEMS 12-19 ASTORIA BOULEVARDLONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	NYC		PARESH SHAH		29 PHILLIP DRIVE PARSIPPANY NJ 07054	02/13/2017	02/13/2022
DOL	NYC	*****9422	PELIUM CONSTRUCTION, INC.		22-33 35TH ST. ASTORIA NY 11105	12/30/2016	12/30/2021
DOL	DOL		PETER M PERGOLA		3 WEST MAIN ST/SUITE 208 ELMSFORD NY 10523	01/23/2017	01/23/2022
DOL	DOL		PIERRE LAPORT		224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	DOL	*****1543	PJ LAPORT FLOORING INC		224 COUNTY HIGHWAY 138 BROADALBIN NY 12025	03/07/2017	03/07/2022
DOL	NYC	*****5771	PMJ ELECTRICAL CORP		7113 FORT HAMILTON PARKWA BROOKLYN NY 11228	12/09/2016	12/09/2021
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC	*****4532	PROFESSIONAL PAVERS CORP.		66-05 WOODHAVEN BLVD. REGO PARK NY 11374	04/20/2017	04/20/2022
DOL	DA	*****6817	QUADRANT METAL BUILDINGS LLC		2740 SW MARTIN DOWNS BLVD PALM CITY FL 34990	08/25/2016	08/25/2021
DOL	NYC		RAMESHWAR ASU		137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020
DOL	DOL	*****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP		3 PARK CIRCLE MIDDLETOWN NY 10940	01/30/2018	01/30/2023
DOL	AG	*****7015	RCM PAINTING INC.		69-06 GRAND AVENUE 2ND FLOORMASPETH NY 11378	02/07/2018	02/07/2023
DOL	DOL		REGINALD WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	NYC	*****3461	RELIANCE GENERAL CONSTRUCTION INC		644 OCEAN PARKWAY BROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DA		RIANN MULLER		2740 SW MARTIN DOWNS BLVD PALM CITY FL 34990	08/25/2016	08/25/2021
DOL	DOL	*****9148	RICH T CONSTRUCTION		107 WILLOW WOOD LANE CAMILLUS NY 13031	11/13/2018	11/13/2023
DOL	DOL		RICHARD MACONE		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023

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DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL	*****9148	RICHARD TIMIAN	RICH T CONSTRUCTI ON	108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	11/13/2018	11/13/2023
DOL	DOL		ROBBYE BISSEAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		3 GAYLORD ST AUBURN NY 13021	11/15/2016	11/15/2021
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	NYC		ROBERT HOHMAN		149 FIFTH AVE NEW YORK NY 10010	12/29/2016	12/29/2021
DOL	DOL	*****3859	ROCHESTER ACOUSTICAL CORP		P O BOX 799 HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL		RODERICK PUGH		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL	*****4880	RODERICK PUGH CONSTRUCTION INC.		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	NYC		RODNEY SCOTT		201 HEMPSTEAD AVE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		ROSEANNE CANTISANI			06/12/2018	06/12/2023
DOL	DOL		RYAN ALBIE		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	*****3347	RYAN ALBIE CONTRACTING INC		21 S HOWELLS POINT ROAD BELLPORT NY 11713	02/21/2017	02/21/2022
DOL	DOL	*****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	*****7730	S C MARTIN GROUP INC.		2404 DELAWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	NYC		SABIR MUHAMMED		SUITE B-8 782 PELHAM PARKWAY SOUTHBRONX NY 10462	04/21/2016	04/21/2021
DOL	DOL		SALVATORE A FRESINA			08/26/2016	08/26/2021
DOL	DOL		SAM FRESINA			08/26/2016	08/26/2021
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC		SANDEEP BOPARAI		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	NYC	*****2117	SCOTT ELECTRICAL SERVICE, LLC.		201 HEMPSTEAD AVE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020
DOL	DOL	*****9751	SCW CONSTRUCTION		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	AG		SERGIO RAYMUNDO		109 DUBOIS RD. NEW PALTZ NY 12561	05/20/2016	05/20/2021
DOL	NYC	*****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL	*****1961	SHANE BURDICK	CENTRAL TRAFFIC CONTROL, LLC.	2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE BURDICK		2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE NOLAN		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	*****0816	SOLAR ARRAY SOLUTIONS, LLC		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023

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DOL	DOL	****4025	SOLUTION MATTERS INC		198 NORWOOD ROAD PORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL	****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	DOL	****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		STEFANOS PAPASTEFANOU, JR. A/K/A STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL	****9751	STEPHEN C WAGAR		544 OLD ROUTE 23 ACRE NY 12405	02/14/2017	02/14/2022
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	NYC		STEVEN GOVERNALE		601 PORTION RD RONKONKOMA NY 11779	11/18/2016	11/18/2021
DOL	DOL		STEVEN MARTIN		2404 DELWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		STEVEN P SUCATO		15-68 208TH STREET BAYSIDE NY 11360	06/23/2016	06/23/2021
DOL	DOL		STEVEN TESTA		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	NYC	****9432	SUBLINK LTD		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	NYC	****5863	SUKHMANY CONSTRUCTION, INC.		185-06 56TH AVE FRESH MEADOW NY 11365	10/17/2017	10/17/2022
DOL	DOL	****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TALAILA OCAMPA		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	DOL	****9852	TAP STEEL INC		ROUTE 26 3101 P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL		TEST		P.O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	****5570	TESTA CORP		50 SALEM STREET - BLDG B LYNNFIELD MA 01940	01/23/2017	01/23/2022
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	****8174	THE DALRYMPLE CORPORATION		UNIT 278 541 10TH STREET NWLANTA GA 30318	12/01/2015	12/01/2020
DOL	DOL	****8174	THE DALRYMPLE GROUP LLC		289 JONESBORO RD/ STE 216 MCDONOUGH GA 30253	12/01/2015	12/01/2020
DOL	DOL		TIMOTHY A PALUCK		C/O TAP STEEL INC RTE 26 3101/ P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL	****3453	TORCHIA'S HOME IMPROVEMENT		10153 ROBERTS RD SAUQUOIT NY 13456	08/09/2016	08/09/2021
DOL	DOL	****8311	TRIPLE B FABRICATING, INC.		61 WILLETT ST. PASSAIC NJ 07503	10/26/2016	10/26/2021
DOL	DOL	****9407	TURBO GROUP INC		15-68 208TH STREET BAYSIDE NY 11360	06/23/2016	06/23/2021
DOL	DOL	****6392	V.M.K CORP.		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	NYC		VALERIE VISCONTI		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	NYC	****7361	VIALE HOLDINGS, INC.	MOVING MAVEN	1010 NORTHERN BLVD. GREAT NECK NY 11021	03/09/2017	03/09/2022
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	DOL		VICTOR ROTENBERG		C/O GMDV TRANS INC 67048 182ND STREETFRESH MEADOWS NY 11365	06/24/2016	06/24/2021
DOL	NYC		VIKTAR PATONICH		2630 CROSEY AVE BROOKLYN NY 11214	10/30/2018	10/30/2023

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DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		VITO GARGANO		1535 RICHMOND AVE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC	*****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		WAYNE LIVINGSTON JR	NORTH COUNTRY DRYWALL AND PAINT	23167 COUNTY ROUTE 59 DEXTER NY 13634	10/24/2016	10/24/2021
DOL	DOL	*****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		WHITE PLAINS CARPENTRY CORP		442 ARMONK RD	06/12/2018	06/12/2023
DOL	DOL		WILLIAM C WATKINS		1229 JAMES STREET SYRACUSE NY 13203	05/02/2017	05/02/2022
DOL	DOL		WILLIAM DEAK		C/O MADISON AVE CONSTR CO 39 PENNY STREETWEST ISLIP NY 11795	11/02/2016	11/02/2021
DOL	DOL	*****6195	WILSON BROTHER DRYWALL CONTRACTORS		36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL	*****4043	WINDSHIELD INSTALLATION NETWORK, INC.		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	*****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL	*****7345	YES SERVICE AND REPAIRS CORPORATION		145 LODGE AVE HUNTINGTON STATION NY 11476	08/09/2016	08/09/2021
DOL	DOL		YURIY IVANIN		C/O MOUNTAIN'S AIR INC 2471 OCEAN AVENUE-STE 7ABROOKLYN NY 11229	09/24/2012	09/18/2020
DOL	NYC		ZAKIR NASEEM		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022
DOL	NYC	*****8277	ZHN CONTRACTING CORP		30 MEADOW ST BROOKLYN NY 11206	10/10/2017	10/10/2022

01 11 00 Description of Work (Section A)

1. Work to be Done

The work to be done under the Contract, in accordance with the Contract Documents, consists of performing, installing, furnishing and supplying all materials, equipment, labor and incidentals necessary or convenient for the construction of SUCF Project No. 081047-00 SUNY New Paltz Roof Replacement and carrying out all of the duties and obligations imposed upon the Contractor by the Contract Documents.

The main features of the work shall include, but not be limited to the following:

The work shall be as shown and called for in the contract documents and shall include, the following general items of work.

- The scope of work includes a complete roof replacement of the Smiley Arts Building (35,000 gsf), College Theatre (29,200 gsf), Dorsky Museum (6,400 gsf) and Faculty Office Building (10,812 gsf). All buildings will be occupied during the work.

Faculty Office Building

Include the following:

- Remove existing built-up epdm roofing system. For estimating purposes, assume fifty percent of the structural sheathing will require replacement.
- Provide a new TPO membrane (gray) tapered insulation system, including required insulation across the entire deck and additional wood blocking as required. Provide yellow caution line 6 feet from open roof edge.
- Introduce a tapered insulation system to eliminate ponding.
- Provide required insulation across entire deck, include wood blocking and flashing.
- Replace all aluminum edge flashing.
- Replace edge scuppers, properly detailed, and incorporate into gutter system.
- There are (4) large hvac units on roof curbs on each of the two buildings. Disconnect and remove the units, replace roofing and re- set units on new curbs. Refer to MEP drawings and specifications for scope of work.
- Fall protection is not required on this building.
- Remove and replace four skylights and curbs in kind.
- Re-roof the two connecting covered walks (remove shingles and replace with metal standing seam roof).
- Provide walkway pads at eaves of the two roofs (4 locations) for protection from ice.

- Provide walkway pads to and around each ventilating unit, all 4 sides.

Smiley Arts Building

include the following:

- Remove existing built-up epdm roofing system.
- Provide a new TPO membrane (gray) tapered insulation system, including required insulation across the entire deck and additional wood blocking as required. Provide yellow caution line 6 feet from open roof edge.
- Replace copper edge flashing at lower and upper roof.
- Replace copper counter flashing around the perimeter of the penthouse (assume counter-flashing has been set in a bed of asbestos mastic).
- Cut bottom of existing copper siding around penthouse to accommodate new roofing system. Provide treated lumber to attach to base of penthouse to allow for new roofing termination and flashing to existing copper siding.
- Provide new bronze termination rings and metal domes at fourteen (14) existing roof drains and coordinate with new roofing system.
- Disconnect and reinstall two (2) large HVAC units on new roof curbs.
- There are approximately thirteen (13) small ventilation fans and six (6) large gooseneck fans to be removed and slab repaired for roofing.
- Provide anchor point fall protection at the second floor main roof for maintenance of drains.
- Remove and replace skylights (19), with new insulated curbs. Eleven (11) are 4'x4', two (2) are 3'x3' and six (6) are 2'x 2'.
- Provide walkway work pads to and around each roof top unit, 4 sides.
- Replace the two existing roof access doors with new hollow metal doors in existing frames, raise the door thresholds to accommodate the new insulation thickness and required 8" roof system termination.

College Theatre

Include the following:

- Remove existing built-up epdm roofing system.
- Provide a new TPO membrane (gray) tapered insulation system, including required insulation across the entire deck and additional wood blocking as required. Provide yellow caution line 6 feet from open roof edge.
- Replace copper edge flashing at all roofs.

- Disconnect two (2) large HVAC units at "R8" and "R10". Replace with new units in kind on new roof curbs. Provide temporary unit during work.
- At area "R4", replace the existing hollow metal door on the west elevation and provide a new metal stair and flash into the new roof system, the stair is approximately +/-30 inches in height.
- At area "R5", remove (10) existing 8'x8' skylight assemblies and replace in kind on existing curbs.
- Install new building expansion joint between roofs "R5" and "R4".
- At area "R6", there are two large 5'x12' smoke vents to be removed and replaced in kind on new curbs. Remove and replace in kind four (4) roof drains and one (1) roof hatch. Provide anchor point fall protection for maintenance of equipment and drains.
- At area "R7", the roof hatch and curb shall be removed. Provide new roof hatch and curb.
- At area "R8", replace the existing 3'x3' foot skylights (9 in total) with new insulated curbs and skylights. The existing counter flashing shall be removed and replaced to accommodate new insulation at these areas. Provide walkway pads across the area. Provide roof ladder to access roof level "R9", approximately 10 feet high.
- At area "R9", the roof hatch and curb shall be removed. Provide new roof hatch and insulated curb. At area "R10", replace two (2) 4'x4' skylights with new insulated curbs. Refer to MEP drawings and specifications for scope of work.

Dorsky Museum

Include the following:

- Provide a new TPO membrane (gray) tapered insulation system, including required insulation across the entire deck and additional wood blocking as required. Provide yellow caution line 6 feet from open roof edge.
- Retrofit seven (7) roof drains and four (4) scuppers. Refer to MEP drawings and specifications for scope of work.
- Provide a roof ladder from roof section "R3b" to roof section "R3c" to access the roof drain for maintenance, assume 15 feet in height.
- Provide anchor point fall protection at roof level "R3c" roof drain.
- Remove and replace in kind four (4) skylight windows located on roof "R3e" on existing curbs.

All work at the existing buildings will comply with the 2020 Existing Building Code of NY State and SUCF directives and design guidelines. The current 2020 code includes ICC A117.1-2009 for accessible and usable buildings.

2. Work Not Included:

Work not included in the work of the Contract are those items marked "N.I.C"; movable furnishings, except those specifically specified or indicated on the Drawings; and items marked "by others".

01 11 13 Coordination with Other Contracts

Ongoing projects at New Paltz will be the:

1. 081019 (SUCF Project) Student Union Building 4th Floor Renovation.
2. 081018 (SUCF Project) Lecture Center Bridges.
3. 1907(081051) (Campus Project) Coykendall Science Building Condensate Lines.
4. 081034 (SUCF Project) Fine Arts Building Façade Repair.

01 18 13 Utility Shutdowns and Cutovers

1. Except as otherwise expressly provided in the Contract Documents, the Contractor shall be responsible for submitting to the Consultant and the Fund, for their approval, a proposed schedule of all utility shutdowns and cutovers of all types which will be required to complete the Project; said schedule should contain a minimum of eight (8) weeks' advance notice prior to the time of the proposed shutdown and cutover. Most campuses of the State University of New York are in full operation 12 months of the year, and shutdowns and cutovers, depending upon their type, generally must be scheduled on weekends, at night, or during holiday periods. The contract consideration is deemed to include all necessary overtime and all premium time, if any, that is required by the Contractor to complete the shutdowns or cutovers.
2. In the event the Contractor shall disrupt any existing services, the Contractor shall immediately make temporary connection to place such service back into operation and maintain the temporary connection until the Contractor makes the permanent connection. All work must be acceptable to the Consultant and the Fund.

01 23 00 Alternates (Section B)

1. General
 - a. The extent and details of the Alternates are indicated on the Drawings, and described in the Project Manual.
 - b. Where reference is made in the description of the Alternate to products, materials, or workmanship, the specification requirements applicable to products, materials or workmanship in the Total Bid shall govern the products, materials, and workmanship of the Alternate as if these specification requirements were included in full in the description of the Alternates.
2. Alternates
"None"

01 26 13 Requests for Information

1. In the event that the Contractor determines that some portion of the Drawings and Project Manual for the project requires clarification or interpretation by the Consultant per Section 2.01 of the Agreement, the Contractor shall submit a Request for Information (RFI) in writing to the Consultant. The Contractor shall create an RFI log in a format approved by the Consultant. Submit the RFI log to the consultant prior to each periodic Field Meeting. Update the RFI log to reflect comments received at the Field Meetings. The Contractor shall define the issue that requires clarification or interpretation in clear and concise language as follows:
 - a. The Contractor shall customize RFI forms and logs for this project and submit them to the Consultant for review and approval prior to submission of any RFIs.
 - b. Forms should include provisions for the Consultant's response, Contractor acceptance of response or rephrasing of question, and the Consultant's additional response if requested.
 - c. Forms should include provisions for locating the issue within the building, by room number, name and nearest columns.
 - d. RFIs shall confirm that reasonable locations for the information required have been reviewed and document those locations by specific references to the Drawings and Project Manual on the RFI.
 - e. The Contractor shall review the RFI for systemic or global implications, including review of other pending RFIs and work of other phases, so that the final RFI submitted represents a reasonable consolidation of similar requests.
 - f. The Contractor shall coordinate and review the RFIs originating from its trades, subcontractors, suppliers, manufacturers, etc. for compliance with this process, including polling them and meeting with them onsite to review the issue prior to its submission as an RFI. The Consultant may attend such meetings.
 - g. Contractor to coordinate response from Consultant with subcontractors.
 - h. The RFI shall contain a description of what the Contractor believes to be the intent of the design documents, with due regard to Section 1.06 of the Agreement, along with reasons why the RFI is required.
 - i. RFIs shall only be submitted on the approved forms.
 - j. RFIs that do not comply with the above requirements will be returned to the Contractor for revision and resubmission.
2. The Consultant will review all RFIs to determine whether they are RFIs within the meaning of this term as defined above. If the Consultant determines that the document submitted is not an RFI, it will be returned to the Contractor un-reviewed as to content, for resubmission in the proper manner and it will be removed from the RFI log.
3. The Consultant will respond to all RFIs within 10 business days of its receipt, unless the Consultant determines that a longer time is required for an adequate, coordinated response. If the longer response time is deemed necessary, the Consultant will notify the Contractor of that necessity and indicate when the response will be completed within 10 business days of its original receipt.

4. Based on projects of similar complexity, it is anticipated that there may be up to 150 RFIs on this project and that multiple responses may be required to adequately answer each RFI.
5. Responses to RFIs shall not change any requirements of the documents.

01 26 43 Amendments (Section E)

1. Amend the Agreement as follows:

In Article I, Section 1.12, Notices, after the “The State University Construction Fund” in the line starting with Name, insert “Richard Finkel”; in the line starting with Title, insert “Facilities Program Coordinator” in the line starting with Address, insert “The State University Plaza, 353 Broadway, Albany New York 12246”; and in the line starting with Telephone Number, insert “518-320-3208” and in the line starting with E-mail address, insert “Richard.Finkel@suny.edu”.

2. Amend the Agreement as follows: (Not Required)

3. Amend the AGREEMENT as follows:

In Article II, Section 2.20, paragraph 1(b), 12th line, after the word “Section” ADD the following:

“except for the single / sole source shown in Specification Sections Finish Hardware 087100-2.2-A where the use of another product is not permitted.”

4. Amend the AGREEMENT as follows:

In Article V, Section 5.06 is amended as follows:

In Section 5.06 (2) (a), Delete the last sentence and insert the following in its place: “The limits under such policy shall not be less than: \$2,000,000 each occurrence; \$2,000,000 general aggregate; and products/completed operations with an aggregate limit of \$2,000,000.”

5. Amend the AGREEMENT as follows: (Not Required)

6. Amend the Agreement as follows

- a. In Article VI, Section 6.03, Part (2) Contract Goals, DELETE paragraph (a) in its entirety and replace with the following:

“a. For purposes of this **Contract**, the Fund hereby establishes goals of 5% for Minority-Owned Business Enterprises (“MBE”) participation and 5% for Women-Owned Business Enterprises (“WBE”) participation (**collectively, “MWBE Contract Goals”**).

i. The 5% goal for Minority-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from MBEs.

ii. The _5__% goal for Women-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from WBEs.”

7. Amend the Agreement as follows:

In Article IX, Use of Service-Disabled Veteran-Owned Business Enterprises in Contract Performance, paragraph (5), change “«SDVOB_goal»%” to “_3%”

01 29 00 10 Payment to Campus for Utilities

Where meters are specified for temporary power, water, steam/HTHW, gas or other utility, the contractor shall read the meters monthly in the presence of Campus and Site Representative. Submit documentation of the utility usage in writing within seven days reading a meter. The Campus may bill the Contractor for utility usage on a monthly basis. Bills shall be paid by the Contractor within 30 days of receiving progress payments covering the utility usage.

01 31 00 Project Management Procedures

The SUCF booklet titled “*Management of Design & Construction Manual*” contains forms, schedules sample documents, communications protocols, procedural requirements for meetings, submittals, reporting, testing, inspection, demonstration, acceptance, payments, changes, turnover, closeout and other administrative requirements. With specific direction from the Fund, the Contractor shall comply with the applicable construction phase requirements in the “*Management of Design & Construction Manual*” during the work of the Contract. Current versions of the forms are available at the SUCF website:

https://sucf.suny.edu/sites/default/files/docs/ManagementOfDesignConstructionManual_02-2020.pdf .

01 31 00 10 Single Contract Responsibility

The Agreement with the Contractor is for a single contract to provide all work shown and specified. Any reference to separate electrical, communications, mechanical, plumbing, etc. contracts, unless clearly designated with another contract number or as “NIC”, shall refer to the Contractor. Any reference to “Consultant”, “Engineer”, “Landscape Consultant”, etc. shall be deemed to refer to the Consultant defined in Article 1.01 of the Agreement.”

01 31 13 10 Exploratory Demolition

1. Perform exploratory demolition to discover subsurface and other physical conditions that differ substantially from those shown on or described or indicated on the Contract Drawings. Exploratory demolition shall begin upon receipt of the Notice to Proceed and occur in locations selected in coordination with the Consultant. Exploratory demolition includes removal of portions of the building and site construction, improvements, systems, fixtures and finishes. Perform

demolition in a controlled manner so as to not affect Asbestos Containing Materials, Presumed Asbestos Containing Materials, Mechanical, Electrical, Plumbing and other building systems in ceilings, wall cavities, pipe chases and other concealed spaces. Where required to expose existing conditions, perform selective abatement of asbestos and other work in Divisions 2 through 28 of the technical specifications. Provide access to the Consultant to visually inspect conditions uncovered. As required by Section 2.12 of the Agreement, notify the Consultant of physical conditions discovered during exploratory demolition. Provide temporary barriers and coverings over the uncovered areas. Provide control measures to properly limit the spread of dust, debris, and other materials. Legally dispose of debris generated during the selective exploratory demolition.

2. Exploratory demolition shall be paid for as a Field Order in accordance with Section 4.05A of the Agreement, except for the following work, which is part of the base bid: "None"

01 31 19 Field Meetings

Periodic job meetings will be scheduled by the Consultant during the course of construction. The Contractor, and, upon request of the Consultant or the Fund, its principal subcontractors and manufacturer's representatives, shall attend such meetings and be prepared to furnish answers to questions on progress, workmanship, requests for Information, supplementary information, scope and price for extra work, if any, or any other subject on which the Consultant or the Fund might reasonably require information.

1. In addition to the requirements of Section 3.06 of the Agreement, the Contractor shall submit bi-weekly reports to the Consultant summarizing the last two weeks of work and next two weeks of work anticipated, listing the percent of work complete by trade, tabulating manpower utilized / projected, relevant shop drawing and submittals progress, relevant offsite fabrication progress and providing other information which may be reasonably required to understand the progress of the work.
2. The personnel representing the Contractor and its principal subcontractors shall have the authority to make decisions directly affecting the work.
3. In addition to the above meetings, meet to review fire safety periodically during the work and, starting approximately sixteen weeks prior to the scheduled date of substantial completion, the Contractor's principals, project manager and those of its significant subcontractors shall attend additional weekly meetings with the Owner and its consultant(s) to review the progress on preparing close out deliverables, including those in Sections 01 78 23, Operating Instructions and Manuals, 01 78 36, Warranties and 01 79 00, Training of Campus Personnel.

01 31 19 10 Mock ups

1. Progress on the completion of mock ups specified in Divisions 2 through 48 shall be addressed by the Contractor at periodic meetings.

2. Provide a list of mock ups with their dates for installation to begin, installation completion, Consultant review period (which may be up to 15 working days), punch list corrections, and mock up acceptance.
3. For compliance with Section 3.03 of the Agreement, a mock up shall be considered a Sample. Accepted mock ups shall be clearly segregated and marked and remain undisturbed and accessible during the work.
 - a. Accepted mock ups are the Sample and the criteria against which the remaining work shall be judged.
 - b. Spaces with interior mockups shall have the scheduled lighting fixtures installed, or the equivalent temporary lighting, as approved by the Consultant, during the review and approval period.
 - c. Remove markings when directed by the Consultant.
 - d. Promptly record mock up locations on the Record Drawings.
 - e. Where the markings have been removed and not record exists as to which surface was the mock up, the Consultant may either select a different surface as the mock up or direct the Contractor to install another one, at no additional cost to the owner.
 - f. Unless an accepted mock up is specified to remain in Divisions 2 through 48, demolish and remove mockups when directed by the Consultant.
4. Installation methods, environmental conditions and other contractor employed means and methods for installing the mock up may be observed by the Consultant and shall be employed and maintained in all remaining work.
5. In addition to the mock ups that are specified in Divisions 1 through 48, inclusive and for the purposes of determining if workers are suitable and competent in accordance with Section 2.07 of the Agreement, the Consultant may direct the Contractor to have workers provide mock ups to demonstrate their ability to properly perform their work prior to performing work that will be part of the completed Project.

01 31 19 33 Pre-Installations Meetings

1. Attend meetings to coordinate the efforts of all concerned parties with construction activities and to demonstrate that adequate preparations for particular construction activities have been completed. These meetings are required for any mobilization, demolition work, excavation, removal of any demolished or excavated material from the site, LEED related work, concrete work, steel erection, waterproofing, roofing, utility shutdowns or taps, commissioning or campus training related work and where required within each specific section of the specifications. The meeting should be attended by the following:
 - a. Consultant
 - b. Construction Fund
 - c. Campus
 - d. Contractor's Superintendent
 - e. Subcontractor's Superintendent / Foreman, as applicable.
 - f. Material and/or Equipment Manufacturer's Representatives, as applicable.

- g. Review and discuss applicable requirements of the work for the following:
 - 1) Compliance with Contract documents and related field or change orders
 - 2) Submittals, products, and mock-ups
 - 3) Manufacturer's recommendations
 - 4) Warranty requirements
 - 5) Employment of competent and suitable workers and equipment
 - 6) Deliveries, storage, and handling
 - 7) Possible conflicts and compatibility problems
 - 8) Schedule
 - 9) Weather limitations
 - 10) Compatibility of materials
 - 11) Acceptance of substrates
 - 12) Quality Assurance
 - 13) Testing and inspecting requirements (including Special Inspections)
 - 14) Temporary facilities and controls
 - 15) Space and access limitations
 - 16) Regulations of authorities having jurisdiction
 - 17) Required performance results
 - 18) Protection of completed construction
 - 19) Other factors that may reasonably apply to the work

01 31 26 Document Tracking and Change Control

- 1. The Contractor shall maintain a computerized document and change control system to prepare, monitor status, and electronically file and send all documents and changes associated with, and required for the Project. If this system is different than the system required in Section 01 33 23, Shop Drawings and Samples, customize and configure this system as required to provide optimal coordination with the system required in Section 01 33 23.
- 2. The Contractor must have a MAPI-compliant e-mail system, such as Microsoft Outlook or Exchange.
- 3. The Contractor must provide experienced and trained personnel to maintain the document control system per this requirement. If the Consultant or the Fund determines that experienced personnel are not operating the control system, then the Contractor's personnel must attend the minimum training at Contractor's sole expense.

01 32 13 Special Project Schedule/Phasing

- a. The Contractor shall be permitted to start field-work subject to the following.
 - 1. In accordance with Section 2.06 of the Agreement, provide onsite the approved superintendent who has documented experience on three (3) other projects of similar size and scope where he effectively lead and managed crews of the size required to perform the similar work, planned and implemented a similar sequence of work that minimized the impact to campus/building occupants and deployed and managed the workers required to meet the schedule and the specified level of quality for the completed similar work.

2. Demonstrate that all materials required for the complete performance of the proposed field work are on site, inspected, inventoried and deemed readily available for installation of the work.
3. Provide a sequenced, summary list of field activities related to the transfer of the work areas from the campus to the contractor and related mobilization activities. Include those related to posting and notification to campus, erection of temporary signage for code, directional and informational purposes, and other activities required to facilitate the start up of construction activities. Review the list with the campus and the consultant and modify it to incorporate their comments. Follow the sequence of the approved list during field activities.
4. Submit the Safety Procedures Manual required in Paragraph 01 35 13, "Safety and Protective Facilities," below.
 - a. In order to assist the Contractor in the planning and scheduling of construction activities, the documents have diagrams and narratives depicting a preferred sequence for closing off portions of the buildings and campus and for performing and completing portions of the work. The preferred sequence provides for continuity of campus operations and describes certain work necessary for continuity of campus operations. Provide all sequencing and minor phasing that may not be specifically indicated on the phasing documents but is reasonably inferable from the way the campus operates. The Contractor may propose alternative construction phasing, provided such phasing satisfies the requirement of continuous campus operation.
 - b. The Contractor shall schedule the Work for expeditious completion in accordance with Section 3.01(2) of the Agreement. The proposed schedule must be established in cooperation with the Campus and account for Campus calendar restrictions listed in this section that affect the Contractor's access to the work areas and construction activities. At each periodic meeting, the Time Progress Schedule required by Section 3.02 of the Agreement shall be reviewed for compliance with phasing requirements. Revise and update the Time Progress Schedule to properly depict the work required to maintain continuity of campus operations.

First phases of work shall include appropriate time in the schedule for: (1) understanding Campus operations, training crews, acclimating trades and Campus to sequence and apportionment of activities; (2) additional meetings (up to twice a week during the first twelve weeks after the Notice to Proceed) with the Owner, consultant and the Contractor's principals, project manager and those of its significant subcontractors; (3) re-sequencing activities to recover from start up delays in the progressive operation of interrelated work and (4) other activities commonly associated with the start up of field work.
 - c. Academic Calendar: The Contractor is advised that the Campus intends to maintain a full institutional program throughout the Project duration. The Campus will make continuous use of adjacent spaces, buildings and site, except where work is scheduled or specified to occur. All Contract work must be scheduled and performed without causing unscheduled interruption of the normal institutional activities and processes. The Contractor shall coordinate his work with the following Campus Calendar, and No Utility shutdowns will be permitted during Registration, Study Periods, Exam Periods, or Commencement.

Insert web link to campus academic calendar here.

<https://www3.newpaltz.edu/calendars/>

- d. The work site will be available to begin construction immediately upon Notice to Proceed. Unless otherwise indicated, normal working hours on the campus are between 7:00 AM and 4:00 PM. Sequence the work in phases to meet the following interim milestones dates:

Describe interim milestones and dates, as applicable

- e. On the Date of Substantial Completion in the Proposal, access to the work area for any uncompleted work and for punch list items shall be restricted to after 5:00 PM and prior to 7:00 AM and comply with the following:
1. Methods of performing work shall not hinder or disrupt the Campus' occupancy, reduce Campus provided levels of cleanliness and ambient environmental conditions and affect building systems, services, and utilities serving the building unless, upon completion of each shift's work that is performed outside of normal Campus work hours, the Contractor provides cleaning to return the work areas to a similar level of cleanliness as normally provided by the Campus, returns spaces to their normal ambient environmental conditions and restores building systems, services, and utilities serving the occupancy.
 2. No material or equipment shall remain inside the building unless in the active use and control of Contractor personnel.
 3. The Contractor shall provide all utility relocations and re-routings necessary to maintain the existing utilities at their current level of service, including limiting their shutdowns for tie-ins and cutovers to those periods specified. All new work shall be in place, tested and accepted prior to performing a shutdown for the required tie in.
- f. Time Delay Allowance: In addition to the requirements of Article III of the Agreement, the base bid contract duration to perform the work specified in the proposal shall include not less than five (5) consecutive and/or non-consecutive eight hour working days in the Time Progress Schedule for delays that are of no fault of the Contractor or any of its subcontractors or suppliers, or caused by events or conditions that could not be reasonably anticipated. Provide notice of delay per Section 3.04 and request use of this time allowance. When approved by Consultant, the time allowance is expended for each work day that the contractor is unable to work and all delay time used is tracked in the Time Progress Schedule. After this base bid time allowance for delay is expended, comply with the requirements of Article III for any additional delays.

01 32 13 10 Scheduling of Work - Contractor's Coordination with locality

Contractor's Coordination with locality: Construction traffic off campus shall be coordinated with the local Department of Public Works and Public Safety Department (845-257-2222). The construction entrance and restrictions shown have been negotiated between the locality and the Owner. The Contractor shall submit a plan showing which off campus streets will be used to access the work areas shown for all work of this contract. The plan for each route used shall indicate types of vehicles, loading, anticipated vehicular noises, calendar days and hours of use, and other reasonable information that may be requested by the Consultant. The Contractor shall provide all necessary notification and training to personnel operating vehicles associated with this project to assure that the routes are followed in compliance with the restrictions. Sequence traffic of this contract to coordinate with and not reduce the current usage of off campus streets.

01 32 13 20 Scheduling of Work - Contractor's Coordination with the with utility companies

1. The Contractor shall coordinate and cooperate with utility companies, including scheduling the work of other trades to sequence with the work schedule required by the utility companies.
2. The Contractor shall pay all costs associated with the work of the utility companies for extension and connection to their services on both a temporary and permanent basis. For gas services, standard fees and special fees for the specified pressure are required.
3. The Contractor shall accept the form of contract proposed by the utility companies without exception.
4. The Contractor shall provide any riders, amendments, etc. to its own insurance policies that it deems proper to cover the work of utility companies in accordance with Article V of the agreement or to cover other liabilities that may arise from the contractor's relationship with the utility companies on this project.
5. The Contractor shall provide prompt payments to utility companies as required to advance their work, but accept payment for such work from the Fund in accordance with Article IV of the Agreement.
6. This project includes work to be performed by the following utility companies:

NAME	Contact	Telephone number
(Not Applicable)		

01 32 16 Project Schedule

Project Schedule shall include the following:

a. After receipt of the Notice of Award but before receipt of the Notice to Proceed, the Contractor, unless otherwise directed by the Fund, shall update the working plan and schedule previously submitted in accordance with the Information for Bidders to define the contractor's planned operations during the first 120 days and submit it to the Fund and the Consultant for their acceptance. The updated working plan and schedule shall be in the form of suitable charts, diagrams or bar graphs and shall be based on the Contractor's logic and time estimates. When updated, such plan and schedule shall be sufficiently detailed

to show clearly, in sequence, all salient features of the work of each trade including: the anticipated time of commencement and completion of such work and the interrelationship between such work, submission of Shop Drawings and Samples for approval, approval of Shop Drawings and Samples, placing of orders of materials, fabrication and delivery of materials, installation and testing of materials, contiguous or related work under other contracts, and other items pertinent to the work. The Notice to Proceed may be withheld until this schedule is received and is deemed responsive to the project requirements.

b. After receipt of the Notice to Proceed but before processing second progress payment application, the Contractor, unless otherwise directed by the Fund, shall submit to the Fund and the Consultant for their acceptance its proposed working plan and project time schedule for all the work covered by the Contract, and shall include activities for preparation and submission of all Shop Drawings and Samples and show all Contractor provided tests that are specified in Divisions 1 through 48, inclusive. Said proposed working plan and schedule shall be prepared in accordance with the form and requirements set forth in the preceding paragraph. In addition to the requirements in 4.10 (1) of the Agreement, the second progress payment application will not be acted on until this schedule is received and is deemed responsive to the project requirements. Submit four (4) printed copies, one PDF and the electronic file in its native format.

c. The aforesaid proposed working plan and schedule shall be revised by the Contractor until they are satisfactory to the Fund and the Consultant, and the same shall be periodically updated monthly: 30 days_ thereafter. Whether or not the Consultant and the Fund have accepted the Project Schedule, submit the Project Schedule to the Fund and the Consultant for acceptance at such time or times as the Fund or the Consultant may request.

d. The proposed working plan and schedule, including any revision or revisions thereof, when accepted by both the Fund and the Consultant will become the Schedule of Record (SOR). The SOR, as the same may be revised as stated above by the Contractor and accepted by the Fund and the Consultant, shall be strictly adhered to by the Contractor.

e. Phases of work shall include time in the schedule for training crews, acclimating trades to the sequence and apportionment of activities, additional meetings with the owner, consultant, Contractor and the significant subcontractors, and re-sequencing activities to recover from start up delays typically caused by normal activities associated with the start up of field work.

Milestone Dates & Summary Activities

- 1) Notice to Proceed (May 19, 2021)
- 2) Mobilization
- 3) Environmental & Abatement
- 4) Site Preparation & Tenant Protection
- 5) Complete all work at the Smiley Arts Building (Roofs R1 & R2).
- 6) Complete all work at the Dorsky Museum with the exception of the lowest section of roof.
- 7) Set up scaffolding for the work at the Theatre Fly roof (Roof R6).
- 8) Complete all work at the Theatre Fly roof (Roof R6) and remove scaffolding.
- 9) Complete all work at College Theatre Roofs R7 & R9.
- 10) Complete all work at College Theatre Roofs R8 & R10. This includes removing two RTU's and installing a temporary unit with insulated flex ducts.

- 11) Complete remaining work to complete work at the lowest roof at the Dorsky Museum (Roof R3).
- 12) Complete all work at College Theatre roof (Roofs R4 & R5)
- 13) Complete all work at the Faculty Office Building.
- 14) Testing, Training & Commissioning
- 15) Life Safety Systems Tested & Accepted (Milestone Date)
- 16) Substantial Completion/ C of O (Milestone Date)
- 17) Start of Guarantee Period
- 18) SUCF Contract Completion Date (if different from above)
- 19) Final Completion - All punch list/outstanding items satisfied (Milestone Date)
- 20) Field Order Work (multiple periods of work proportional to the dollar value of the field order allowance starting at the Notice to Proceed and ending at Substantial Completion.)
- 21) Other milestones as may be required by the Fund, the Consultant or the Contractors – specifically list any significant product whose source is outside of the United States.

01 32 29 Notice of Non-Compliance

1. In the event the Consultant views the work or some portion thereof and finds that it has not been performed in accordance with the requirements of the contract documents, a Notice of Non-Compliance will be issued to the Contractor for action. Payment shall not be made for any portion of the work for which a Non-Compliance Notice has been issued and the work not corrected to the satisfaction of the Consultant.
2. Upon receipt of a Non-Compliance Notice the Contractor shall provide a written response to the Notice within ten (10) working days after receipt of the Notice. The Contractor's response shall detail either:
 - a) Why they believe that the work was performed in accordance with the contract documents, or,
 - b) What corrective action they intend to take, at their sole expense, to correct the non-conforming work.

Refer to Article II Section 2.02 for Contractors contention to the decision.

01 32 33 Project Photographs

1. Prior to beginning work, the contractor shall schedule with the Consultant, the Campus, and the Fund sufficient periods of time in which the Contractor shall photographically record existing conditions for all project areas using digital video in MPEG-2 format. Video shall be made at high resolution (1440 x 1152) and shall adequately zoom in on selected elements for clear representation of existing conditions. All video recording shall be done in the presence of the Consultant. Submit the completed video on DVD disk(s) to the Consultant for the record.
2. Photograph any and all damaged or misaligned materials or surfaces which may in any way be misconstrued as having occurred during the implementation of this Contract. Inspect all existing conditions on all paths of travel on the site, adjacent right of ways, and within the building with the Consultant. With clear labeling and convenient indexing, provide written documentation for

each video disk referencing both the disk and site locations of recorded images of any and all damage that could be misconstrued as being caused by the Contractor's work and/or access. Repair all damage to existing conditions and along the paths of travel caused by Contractor's Operations.

01 32 33 10 Photo Documentation Services (Not Required)

01 32 33 30 Roof Inspection

When directed by the consultant, prior to work on the existing roofs and again after completion of all work on / near those roof levels, use a firm experienced in roof inspection to scan the roofs with the infrared camera. Spray paint the exact contours of any and all moisture laden areas, if any, on the roof surface. During the survey, use a nuclear moisture detector to verify the accuracy of the infrared camera and to check questionable anomalies. Use the nuclear meter to detect moisture, if any, that is located deep in the roofing system. Provide a computer generated roof plan to scale showing all pertinent roof top equipment and the locations, square footages, and contours of all moisture laden areas, if any. If required, provide corrective repairs and replacement roof systems when directed by the Consultant.

01 33 23 Shop Drawings, Samples, Submittals and other information - (Refer to Section 2.19 of the Agreement)

In addition to the requirements of Section 2.19 of the Agreement and as specified in Divisions 1 through 48, inclusive, comply with the submittal requirements of this section. In addition, where the term "or equal" is specified in Divisions 1 through 48, inclusive, refer to and comply with the requirements of Section 2.20 of the Agreement. Shop Drawings required Divisions 1 through 48, inclusive, may include drawings, diagrams, schedules, product data and other information or materials specially prepared for the work by the Contractor to illustrate some portion of the work. Product data required by Divisions 1 through 48, inclusive, are standard illustrations, schedules, performance charts, instructions, brochures diagrams and other information amended by the Contractor to illustrate materials or equipment for some portion of the work.

ELECTRONIC SUBMITTALS

1. The Contractor shall set up and maintain a web-based submittal service to log, transmit and track (in real time) all project related documents.
 - a. All project submittals, reviews and re-submittals shall uploaded in Portable Document Format (PDF) and, if approved by the Consultant, other electronic formats requested by the Contractor. Divide, package and submit all submittals in accordance with Section 01 32 16, Project Schedule.
 - b. The service will also post, track and store RFI's (Request for Information), Supplemental Information, safety procedures manual, emergency contact and action plans, coordination drawings, traffic plans, utility cutover plans, schedule documents, meeting

minutes, look-aheads, daily activity reports, project photo documentation, material safety data sheets, waste manifests, diesel emissions, field surveys, utility bills payable to the campus, campus furnished products, testing activities and results, closeout, Operating Instructions and Manuals, planting maintenance, commissioning submittals, SWPPP documents and other non-product related submittals required in the technical specifications. The service will review the contract documents and provide the list of items to be tracked.

- c. The PDF files shall be created at a minimum resolution of 200 dots per inch utilizing the original document size and full color. Increase the resolution of the scanned file or images being submitted as required to properly present the information. PDFs created by scanning are not acceptable unless all images of text are properly and completely transformed into the electronic characters representing the text.
 - d. The Contractor shall include the full cost of Submittals Website project (all contracts) subscription in their proposal. When approved by the Consultant, all other project related consultants, campus staff, other contractors and vendors will utilize the Submittals Website at no additional charge (unlimited number of users). Web-based training and support shall be available, free of charge from the Submittals Website, for all project participants.
 - e. Acceptable Submittal Website shall document conformance with the following requirements:
 - 1) Independently hosted, web-based system for automated tracking, storage and distribution of contract submittals and other contract related documents. FTP sites, e-mail exchanges, and server-based systems hosted from inside a contractor's office will not be considered.
 - 2) Utilize 256-bit SSL encryption and hosted at SAS70 Type II compliant data centers.
 - 3) Minimum four (4) years' experience of use on comparable commercial construction projects.
 - 4) Website requirements:
 - a) Minimum of four years documented 99.5% website uptime.
 - b) Minimum on-line storage required for the duration of this contract (until final closeout).
 - c) Redundant storage of all project information (all contracts) at a minimum of two geographically separate storage sites (not in the same building).
 - f. At completion of project, provide PDF/A copies of all submittals (except physical samples) stored and labeled on four (4) sets of archival optical discs, Universal Serial Bus (USB) flash drives or other electronic data storage devices approved by the Consultant, which include all documents and tracking logs in a navigable format.
2. Paper prints (hard copies) of reviewed submittals:
- a. Provide Two Set Record Paper Copies:
 - 1) Paper copies shall be printed in a size format equal to the original document.

- 2) Scaled Shop Drawings shall be printed to the scale noted on the drawings.
 - 3) The resolution of the printed copy shall be equal to that of the PDF file that it is being printed from.
- b. Contractor Copies: The Contractor will be responsible for making copies, for the Contractor's own use and for use by its subcontractors and suppliers.
 - c. Those marked "*REJECTED*" are not in accordance with the Contract Documents and shall be resubmitted.
"REVISE AND RESUBMIT" Contractor shall correct and resubmit.
"MAKE CORRECTIONS NOTED": The contractor shall comply with corrections and may proceed. Resubmittal is not required.
"APPROVED - NO EXCEPTIONS TAKEN": The contractor may proceed.
 - d. All shop drawings and/or submittals used on the construction site must bear the impression of the Consultant's review stamp as well as the Contractor's review stamp, indicating the status of review and the date of review. Contractor Copies: The Contractor will be responsible for making copies, for the Contractor's own use and for use by its subcontractors and suppliers.
 - e. All shop drawings shall reflect actual site conditions and accurate field dimensions. Dimensioned shop drawings shall be submitted for all fabricated items. Incomplete submittals will be rejected without review. Using electronic copies of the contract documents to prepare shop drawings, if permitted in the technical specifications, doesn't relieve the contractor of its responsibility for the accuracy of all information contained on the shop drawings. Verify and coordinate all information necessary to produce accurate and complete shop drawings.
 - f. All shop drawings, submittals and samples shall include:
 - 1) Date and revision dates.
 - 2) Project title and number.
 - 3) Names of:
 - i. Contractor
 - ii. Subcontractor
 - iii. Supplier
 - iv. Manufacturer
 - g. Provide information regarding shop drawings, submittals and samples at the Periodic Meetings.
 - h. The project specific submittal log is bound after the General Requirements. Note: The bound submittal log provides a general submittals (shop drawings, samples, mock-ups, O&M manuals, training, extra stock, maintenance during the guarantee period, warranties, test reports and other submittals) in the technical specifications and may not be all inclusive. In case of conflict or omission, the requirements of the technical specifications take precedence over the bound log.

- i. At completion of project, provide PDF/A copies of all submittals (except physical samples) stored and labeled on four (4) sets of archival optical discs, Universal Serial Bus (USB) flash drives or other electronic data storage devices approved by the Consultant that include all documents and tracking logs in a navigable format. PDFs created by scanning are not acceptable unless all images of text are properly and completely transformed into the electronic characters representing the text.

01 33 23 20 Coordination Drawings (“not required”)

01 35 13 Conducting Work

1. All work is to be conducted in such a manner as to cause a minimum degree of interference with the Campus’ operation and academic schedule. Prior to any excavation, demolition or other work that may impact campus and/or building utilities, systems and infrastructure by causing alarm(s), failure(s) or interfering with the ability of utilities, systems and infrastructure to serve the campus, provide a written emergency action plan that clearly describes the steps required to safely shut down utilities, systems and infrastructure that are within the work area and those outside the work area and within approximately 25 feet of the work area limits, as approved by the Consultant. The plan shall with the Fire Code of New York State. The emergency action plan shall identify the shut off point(s) for each utility, system and infrastructure and secondary shut off point(s) if the primary points fail or inaccessible. To identify shut off points, trace each utility, system and infrastructure in the presence of the campus representative from the work area to the shut off points. The emergency action plan shall describe the shutdown procedure, identity tools required for shutdown, sequence of activities required for proper shutdown, the name of the person(s) or trade(s) deemed competent to perform each activity in the shutdown sequence and names and telephone numbers of the campus staff required to provide access to shut off points, assist in the shut off or perform portions of the shutdown activities. Submit the emergency action plan for review and approval at least two weeks prior to field work in the work area. Field work shall not begin until the emergency action plan is approved.
2. By the end of each workday, the Contractor shall submit daily manpower counts and a brief description/location of the day’s activities. *PLEASE NOTE: FOREMAN MAY HAVE TO STAY PAST NORMAL QUITTING TIME TO PROPERLY COMPLETE THIS PAPERWORK.* Manpower shall be broken down by job classification (foreman, journeyman or apprentice), and also by number of minority and women workers, including information for all subcontractors, suppliers or other workers. The report shall also note all deliveries, equipment on site, whether inspections passed or failed, visitors and inspections.
3. Proper attire is required on-site. Full-length pants, shirts with sleeves and hard sole work boots are required. No shorts, tank tops or sneakers are allowed. Workers not properly dressed will be sent home.
4. Safe and direct entrance to and exiting from the existing buildings shall be maintained at all times during regular hours while construction is in progress. Means of egress for construction workers shall comply with the Fire Code of New York State. Prior to performing any removals or construction that impairs free egress from existing building exits to refuge areas remote from the

buildings, complete the installation of all temporary fencing, barricades and walkways. Install temporary egress, stairs, ramps and paths around work areas that comply with the Protection of Pedestrians section of the Safeguards During Construction chapter the New York State Uniform Fire Prevention and Building Code.

5. Unless otherwise permitted by the Consultant and the Fund, the removal and/or demolition of given work items shall not occur until the Contractor has all the required replacement materials on-site.
6. The Contractor and its employees shall comply with College regulations governing conduct, access to the premises, and operation of equipment. The Contractor and his/her workers, employees, subcontractors and their workers, etc., will not fraternize with any building or campus occupants. This includes, but is not limited to, students, faculty, and employees of the State other than those designated contacts for this Project, visitors and guests. At no time will it be appropriate to say anything derogatory to any individuals. Harassment, verbal or otherwise, of any individuals will not be tolerated. If an incident of fraternizing or harassment arises, the Contractor will be directed to permanently remove the worker from the site and replace the worker at no additional cost to the Project.

ID Badges: Campus no longer requires ID Badges for Contractors, though request Contractor and Sub-contractor employees wear a badge that identifies what company they work for when they are on campus performing work.

7. The building shall not be left "open" overnight or during any period of inclement weather. Temporary weather tight closures shall be provided for by the Contractor to protect the structure and its contents.
 - a. Provide an emergency plan to secure the work site during severe weather.
 - b. As part of the base bid, for ambient exterior weather conditions, include all reasonable materials, labor and equipment, which may be in addition to those required for the work, to implement the emergency plan for conditions up to the 95th percentile recorded seasonal conditions recorded at the nearest National Weather Service site.
 - i. For conditions meeting or exceeding the 95th percentile, the additional reasonable labor, material and equipment required to implement the emergency plan may be paid for by Field/Change Order when the Consultant determines that such additional labor, material and equipment could not have been reasonably anticipated in the base bid emergency plan.
 - c. As part of the base bid and Article V of the Agreement, for damages caused by ambient exterior weather conditions, provide all reasonable materials, labor and equipment, which may be in addition to those required for the work and/or required to perform stabilization, removals and corrective work caused by severe weather.
 - i. For conditions meeting or exceeding the 95th percentile, the additional time required for corrective work may be paid for by Field/Change Order when the Consultant determines that such time could not have been reasonably anticipated in the base bid emergency plan.

- d. The plan shall describe:
 - i. how weather conditions will be monitored,
 - ii. which forecast weather conditions require emergency preparations,
 - iii. what emergency preparations are required during the anticipated conditions of the job site during the time of the work, including removal of precipitation, securing materials, chemicals, temporary facilities work in place and other steps that could be reasonable anticipated,
 - iv. when such emergency preparations will be implemented,
 - v. who will implement the preparations,
 - vi. who will check the completed preparations to confirm they meet the intent of the plan,
 - vii. who will communicate the plans to local emergency responders,
 - viii. how the site will be monitored during severe weather,
 - ix. who will be on standby to return to the site when permitted by local emergency responders,
 - x. how the damage, if any, will be assessed.
 - e. The emergency plan shall be available for review by the Consultant within four (4) hours or less notice during non-working hours and within thirty (30) minutes during working hours.
8. "Diesel Emissions Reduction Act of 2006 (the "Act"):
- a. The Contractor certifies and warrants that all heavy duty vehicles, as defined in New York State Environmental Conservation Law (ECL) section 19-0323, to be used by the Contractor, its Agents or Subcontractors under this Contract, will comply with the specifications and provisions of ECL section 19-0323 and any regulations promulgated pursuant thereto, which requires the use of Best Available Retrofit Technology ("BART") and Ultra Low Sulfur Fuel ("ULSD"), unless specifically waived by DEC. Qualification for a waiver under this law will be the responsibility of the Contractor.
 - b. Annually, but no later than March 1st, the Contractor shall complete and submit directly to the Fund, via electronic mail, the Regulated Entity Vehicle Inventory Form and Regulated Entity and Contractors Annual Report forms at the Department of Environmental Conservation ("DEC") website for heavy duty vehicles used in the performance of this Contract for the preceding calendar year. Periodically, as requested by the Fund, the Contractor shall certify and submit the Contractor and Subcontractor Certifications form, which states that the Contractor will comply with the provisions of Section 20.23.

Website: <http://www.dec.ny.gov/chemical/4754.html>
Inventory Form: <ftp://ftp.dec.state.ny.us/dar/248inventory.xlsx>
Annual Report Form <ftp://ftp.dec.state.ny.us/dar/248annrptfrm.xlsx>

01 35 13 10 Salvage of Materials

Remove and legally dispose of all debris and other materials resulting from the alterations to State University property. The following items shall remain the property of the Campus and shall be stored at the site as directed by the Consultant:

1. All removed copper shall be neatly stacked on a pallet and transported to the Service Building Grounds fenced area.

01 35 23 Safety and Protective Facilities

1. The Contractor shall provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the Staff, students, the work and property at all times, including Saturdays, Sundays, holidays and other times when no work is being done. The Contractor's Safety Procedures Manual shall be certified by a Certified Safety Professional from the Board of Certified Safety Professionals (www.bcsp.org).
2. The Contractor shall erect, maintain and remove appropriate barriers or other devices, including mechanical ventilation systems, as required by the conditions of the work for the protection of users of the project area, the protection of the work being done, or the containment of dust and debris. All such barriers or devices shall be provided in conformance with all applicable codes, laws and regulations, including OSHA and National Fire Prevention Association (NFPA) 241, for safeguarding of structures during construction. Provide a copy of NFPA 241 for use on site during the work. Barriers shall be made from noncombustible and/or fire retardant materials. As appropriate to the risk and when requested, provide periodic inspections of the safety and protective facilities by competent individuals. Promptly correct any deficiencies observed.
 - a. Prior performing any removals or construction that impairs free egress from existing building exits to areas of refuge remote from the buildings, complete the installation of all temporary fencing, barricades and walkways. Install temporary egress, stairs, ramps and paths around work areas that comply with the Existing Building Code of NYS, Chapter 13 - Construction Safeguards.
 - b. Sequence the construction work to minimize the relocation of the above barriers and walkways. Install, relocate and modify the construction safeguards, barriers and covered walkways as required to perform the work in a manner that limits the temporary closure of any egress path to the least amount of time possible. If any egress path requires closure that is not shown on the drawings, that closure may not be able to occur during normal business hours of the buildings. Where permitted by the Code and if approved by the Campus and the Consultant, portions of interior corridors, aisles and passageways may be closed for limited time periods if such portions are under continuous supervision of the Contractor and the Contractor has a reasonable plan to divert and direct exiting occupants during an emergency.
 - c. The use of existing stairs during roof work, asbestos abatement, or other similar "dirty" work is not permitted. When existing stairs are not available for the Contractor's use, provide a stair when construction work areas are four stories above or below the exit to staging areas on the adjacent grade. The existing/permanent stairs of the Project may be used by the Contractor if the stairs are in essentially new/repaired condition prior to the Fund's acceptance of the structure. Where the existing/permanent stairs are not available for the Contractor's use, provide a noncombustible temporary stair meeting the following requirements:

- 1) Clear width of stair and landings shall be 36" with 6'-8" clear headroom.
 - 2) Riser height shall not exceed 7" and tread width shall not be less than 11".
 - 3) Handrails shall be on both sides between 34" and 38" above tread/landing, be continuously graspable and have a 1 1/4" circular cross section.
 - 4) Each level will have clear signage identifying the level, stair and exit path.
- d. Prior to starting demolition, so as to maintain occupied spaces with their current services and utilities, trace all services and utilities, identify their respective areas and zones of service, both within the work area and outside to work area. Two weeks prior to start of demolition, submit a written plan for each service and utility describing how such services and utilities will be temporarily maintained, shutdown, disconnected and cut, and/or permanently reconnected. Field tracing, testing and identification of services and utilities that requires their temporary shutdown will be done after hours or on weekends.
- 1) The plan should clearly identify any impairment of fire protection system(s), exit signs, exit lighting and/or other code required life safety systems. Add dates and durations of impairments to the Project Schedule.
 - 2) The Project Schedule should allow for the presence of the Campus Fire Prevention Program Superintendent at the time fire protection system(s), exit signs, exit lighting and/or other code required life safety systems are shut off and at the time such systems are restored to partial/full service.
- e. When moving any items (materials, equipment, supplies, tools or other items) through exits, exit access spaces and site areas shared with the campus during occupied hours, provide radio equipped flagger(s) whose sole responsibilities are: (1) to direct pedestrian and vehicular traffic as required to permit the safe transport of the items from the staging area to the work area; (2) to inspect the paths traversed to confirm that they are clean, safe and ready for the campus to resume using; and (3) to confirm that gates, doors, fences, barricades and other temporary controls intended to separate the public from the area(s) controlled by the Contractor are properly restored.
- f. Other than materials required for a work shift, storage of materials shall not be permitted in building spaces shared with the campus. Do not leave any materials, equipment, partially installed work, etc. in a manner that prevents full operational access by the campus to the spaces outside the areas controlled exclusively by the Contractor. Only the material which can be used in one shift shall be moved into the spaces shared with the campus. All other material shall be stored in the areas exclusively controlled by the Contractor. During the work shift, materials, tool boxes, etc. may be dispersed throughout the work locations shared with the campus, as required to perform the work, but shall be continuously attended to, neatly organized and located in a manner that does not create tripping hazards and/or reduce the clear travel path of exits and exit access spaces. All tools and excess material, if any, dispersed through the work locations shared with the campus shall be collected prior to the end of each shift and moved to the approved staging area.

- g. The contractor shall leave the interior building access path to and from the work areas vacuum clean after the completion of each day's work.

3. Fire safety during construction:

- a. If required by the nature of the work and campus regulations, the Contractor shall obtain from the Campus and pay all costs associated with "Confined Space Permits" or "Hot Permits" to execute the work of its contract. Perform hot work in accordance with the Fire Code of New York State and the Hot Work Program approved for the work. Prior to, during and after performing hot work, inspect the hot work area for compliance with the requirements of the permitted Hot Work Program.

See applicable permits and conditions bound elsewhere in this Manual (01 00 00 General Requirement Reference Documents).

- b. Take all reasonable precautions against fire in accordance with good fire engineering practice. Provide all temporary plans, maintenance, programs, equipment, labor and material required for compliance with the applicable provisions of the Fire Safety During Construction and Demolition chapter of the Fire Code of New York State (FCNYS) in the New York State Uniform Fire Prevention and Building Code.
- c. For areas and spaces under their control, the Contractor shall comply with applicable provisions of the Fire Safety During Construction and Demolition chapter of the Fire Code of New York State (FCNYS) in the New York State Uniform Fire Prevention and Building Code. The Campus Fire Prevention Program Superintendent will develop a project specific Fire Prevention Program required by Section 1408 of the FCNYS. The Contractor's superintendent shall be responsible for reviewing the Fire Prevention Program for coordination with the Contractor's work plan, adhering to the provisions of the Fire Prevention Program and implementing the minimum safeguards for construction, alteration, and demolition operations that provide reasonable safety to life and property from fire during the Contractor's operations. The Contractor's superintendent shall also cooperate with the Campus Fire Prevention Program Superintendent, respond to questions raised concerning fire safety and take prompt action to correct conditions which do not meet the applicable provisions of the Fire Safety During Construction and Demolition chapter of the Fire Code of New York State (FCNYS) in the New York State Uniform Fire Prevention and Building Code and the project specific Fire Prevention Program.
- d. Use noncombustible material (metal or fire retardant material) for scaffold, trash chutes, forms, shoring, bracing, temporary stairs, ramps, platforms and boxes when such items are required during the work.
- e. When permanent sprinkler and/or standpipe systems are installed as part of the work, sequence the installation of these systems in a manner that closely follows the construction work, allowing the systems to be partially or fully operational within construction work areas, as required by NFPA 241 and as recommended in its Annex A, Explanatory Material. When permanent/existing sprinkler and/or standpipe systems are

modified as part of the work, sequence the modifications of these systems in a manner that minimizes the duration of time for impairment of the systems.

- f. The “Construction Fire Safety Weekly Review” form and other documents that may be developed by the Campus Fire Prevention Program Superintendent may be used during the inspection program required by NFPA 241 7.2.4.4. A copy of the Construction Fire Safety Weekly Review is bound elsewhere in this Manual.
- g. Comply with Labor Law Section 220-h; provide workers certified as having successfully completed the OSHA 10-hour construction safety and health course; and comply with the applicable NYS DOL rules and regulations for monitoring and reporting compliance.
- h. Prior to beginning any work on site, submit an OSHA compliant site specific Safety Procedures Manual that identifies all site-specific safety issues related to this work and details how each will be addressed. In accordance with OSHA, hold weekly “Tool Box” meetings with jobsite personnel to discuss safety and fire prevention topics as required by NFPA 241 and as recommended in its Annex A, Explanatory Material.
- i. Provide the appropriate “competent” person(s) (as defined by OSHA) on site during the performance of work.
- j. Be responsible for dust control and cleanup. Provide dust curtains, ventilation and negative air machines when grinding or cutting inside the building. Use enclosed chutes whenever materials are dropped more than 10 (ten) feet.
- k. Employ measures to prevent creation of air pollution and odors.
 - 1) On interior work and work adjacent to occupied areas, all passageways and vent systems will be sealed to prevent dust, air pollution, and odors from traveling into occupied areas. Take measures to ensure proper separation, by use of taped fire retardant poly tenting, or other separator. Insure that the integrity of the separation is maintained throughout the period of the work. In the event any trade must remove a barrier, it is their responsibility that the barrier is reconstructed at the end of each work period.
 - 2) Perform exterior work adjacent to air intakes, doors, windows and/or other passageways that may convey odors but cannot be sealed without impacting campus operations during weekends, second or third shift or other off hour periods that mitigates the impact to campus operations. Allow sufficient time to install temporary barriers at the beginning of each off hour period and remove barriers at the end of each off hour period.
- l. If the omission of construction related odors is found to be offensive by building staff, work will stop and efforts to effectively exhaust the odors will begin immediately. Continuance of the odor causing work will be permitted during non-occupied times.
- m. No gasoline/diesel powered engines are permitted inside the building.

- n. Alcoholic beverages or illegal drugs are not permitted on this Project. Smoking may be permitted where it is permitted by campus regulations and controlled in accordance with the Fire Code of New York State, except that smoking shall be prohibited throughout demolition work areas and where required by NFPA 241 and as recommended in its Annex A, Explanatory Material. Post “no smoking” signs in the format and locations required by the Fire Code of New York.
- o. Personal radios with earphones are not permitted on this Project. Loud radio playing is a potential hazard, disrupting to building occupants and is not permitted.
- p. All extension cords, cables and hoses shall be maintained at least 6 feet 6 inches above the working floor. Where this is impossible, these items shall be inspected daily and repaired immediately or tagged and removed from use until repaired.
- q. Store flammable and combustible liquids and flammable gases used during the work in compliance with the Fire Code of New York State.

01 35 23 10 Material Safety Data Sheet

The contractor shall submit MSDS (Material Safety Data Sheet) for all chemicals, solvents, and materials specified or proposed to be used on this project.

01 35 29 10 COVID-19 Contractor Requirements and Guidance for Construction Jobsites

The Contractor will comply with New York State Guidance for Construction Projects, as may be amended or superseded, which is made a part of the contract work for this Project and that all costs and time associated with compliance with this guidance are included in the Contract consideration in Article IV of the Agreement. NYS Guidance for Construction Projects for is available at the following website:

<https://forward.ny.gov/industries-reopening-phase#phase-one-construction>

01 35 73 Delegated Design

At the request of the Consultant and in compliance with the Rules of the New York State Board of Regents, the Fund has allowed the Consultant to delegate to the Contractor certain portions of the design of the work. These portions are listed below in the Schedule of Delegated Design. For portions of the work where design has been delegated, the Consultant has provided, elsewhere in this Project Manual, the complete parameters which the design must satisfy and other requirements. The Contractor shall assign responsibility for the design of the delegated portions of the work to person(s) who are New York licensee(s), or otherwise authorized, who shall sign and certify his/her design work and who are approved by the Consultant.

Schedule of Delegated Design in the Technical Specifications:

Project No.

Project Title:

Section Number	Section Name	Description of Delegated Design (See Section for complete details)

Note: The above list provides a general summary of work delegated in the technical specifications and may not be all inclusive. In case of conflict or omission, the requirements of the technical specifications take precedence over the above list.

01 41 13 Code Compliance and Testing (In addition to Section 2.10 of the Agreement)

1. The Fund, if the same is required by law, will issue a Building Permit for this Project. The project is not subject to any local building code or permit requirements, except for work that the Contractor is to perform on property located outside of the boundaries of the campuses of the State University of New York or on systems or equipment within the boundaries that are owned or controlled by others such as utility companies.
2. Special Inspections: This project may contain work requiring Special Inspections in accordance with the Building Code of New York. The Fund and the Consultant shall exercise control to verify that the construction conforms to the contract documents. In addition to the requirements of Section 2.17 of the Agreement, cooperate with and provide safe access for inspection and testing agencies, as reasonable to allow inspections and tests to be performed. This will require the Contractor to provide and attend to / operate scaffolding, ladders, or lifts. This project may also contain work requiring the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting components and the Contractor shall have provisions for quality control.
 - a. No special inspections have been identified at the time of application for and issuance of the permit for this project.
3. All work involving installation and modification to fire alarm systems shall be performed by individuals or firms currently licensed by the NYS Department of State, Division of Licensing Services. The contractor shall provide copies of the individual's or firm's current license and identification cards for all unlicensed employees performing work for the licensed individual or firm for this project. The Contractor shall post a copy of the license at a location approved by the Consultant.
4. In addition to the requirements of Section 2.17 of the Agreement, before performing system tests, partial system tests or scheduling inspections for fire alarm, fire suppression, electrical, mechanical, plumbing, elevator, site infrastructure and other work that must be completed for a Temporary Authorization to Occupy and/or a Code Compliance Certificate, attend pre-test and inspection meetings for each system with the Consultant.

- a. Provide a list of all Contractor provided tests that are specified in Divisions 1 through 48, inclusive, and list portions of large systems tested separately (see 01 74 00, Clean-Up, for separation criteria), who will perform a test, when it will be done, who witnessed it and when, results (pass/fail), follow up action, comments and other information requested by the Consultant.
- b. The Consultant will review the scope of inspection of the as built installation, review the completeness of the record drawings per Section 2.24 of the Agreement, review the scope applicable tests and review the applicable forms that will be completed as part of the testing and inspection.
- c. Immediately after completion of tests, provide original forms with all information filled out plus six copies to the Consultant. Systems required for Substantial Completion will not be considered completed and accepted until all code required forms are completed, submitted and reviewed by Consultant for completeness. For fire protection systems, provide the Statement(s) of Compliance required by Fire Code part 901.2.1.
- d. Where portions of systems are completed and ready for testing and inspection, those portions will not be considered completed and accepted until all code required forms are completed to the extent applicable to the portion of work completed, submitted and reviewed by Consultant for completeness.
- e. Where portions of systems are excluded from the portions being tested, provide additional work required to functionally extend systems around the excluded portions and to fully separate the tested portions from the excluded portions.
- f. Schedule testing that requires safety clearance or impacts campus activities (such as, but not limited to, x-ray testing of welds) and/or testing that requires utility shutdowns for weekends, holidays and/or 2nd or 3rd shift, as appropriate to accommodate the Campus and mitigate disruption to Campus activities.
- g. Unless otherwise approved by the Fund, all Contractor provided tests that are specified in Divisions 1 through 48, inclusive, must be witnessed and signed off by the Consultant prior to acceptance of the tested work; and, in the Contract Breakdown required by Section 4.08 of the Agreement, the scheduled value of Contractor provided tests shall be 5% of the amount estimated for the work being tested.
- h. In addition to the above testing, and if mechanical, hot water and/or lighting control systems are included in the work, cooperate with the Consultant to complete the commissioning of mechanical, hot water systems and functional testing of lighting controls. Provide a single competent person as the point of contact for all commissioning required in this contract. As applicable, provide workers, equipment, computer programming, fuel, power, means of access, operating instructions and manuals (see Section 01 78 23) and other work required to demonstrate installation, operation, functionality, calibration and other performance criteria of such systems.

01 51 13 Temporary Power for Construction Activities

Electrical energy, as/if it exists within the work area, will be available at no cost to the Contractor from existing outlets or panels from locations approved by the Campus. This power may be used for small power tools (not exceeding 1/2 HP), etc., and the Contractor shall not exceed the capacity of the existing circuits being used. The Contractor shall be responsible for providing all necessary connections, cables, etc. and removal of the same at completion of construction with approval from the Fund. The Contractor shall in no way modify the existing circuits at the panel boards to increase capacities of the circuits. If the required power load exceeds the capacities of the available power sources, the Contractor shall be responsible and pay for furnishing and installing all necessary temporary power poles, cables, fused disconnect switches, transformers and meters necessary to provide complete temporary power requirements for the project, and remove the same at completion. Install all temporary wiring and equipment and make all connections in conformity with the National Electrical Code and the Fire Code of New York State. Make all replacements required by temporary use of the permanent wiring system. Provide ground fault protection.

1. The Contractor shall be responsible for furnishing and installing all necessary temporary power poles, cables, fused disconnect switches, transformers and electrical meters necessary to provide complete temporary power requirements for the completion of the project. Install all temporary wiring and equipment and make all connections in conformity with the National Electrical Code and the Fire Code of New York State. If the electric power system of the State University of New York is used, which use can only be made with the approval of the Consultant and the Fund the Contractor must furnish, install, maintain, and, upon completion of the Project, remove a meter and reimburse the State University of New York for the amount of electric power used, as determined by the aforesaid meter, at the same rate the State University of New York pays for such electrical power.
2. If, for any reason, the permanent power with necessary cable and connections is not available in time to test out the various mechanical and electrical systems of the Project at the time of its scheduled completion, the Contractor shall maintain and keep in use the temporary power facilities until such permanent power is tied in and fully energized.

01 51 16 Temporary Fire Protection

1. If the existing building is to be partially occupied during the course of the project, all existing exits except those shown for closure, fire walls, fire barriers and fire protection systems shall be continuously maintained in the occupied phases in compliance with the Fire Code of New York State and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material, or other measures must be taken which in the opinion of the Consultant will provide equal safety. Those portions occupied by the campus must be available for their use 24 hours a day, seven days a week during the contract period unless otherwise scheduled in these documents. Comply with all applicable State and Federal codes and regulations. Prior to removal of existing fire walls, fire barriers and fire protection systems, if such removal is part of the work, install equivalent temporary fire walls, fire barriers and fire protection systems. The cost of all labor, fire watches, variances, materials, installations, maintenance and removal of such temporary fire protection systems or modifications to the existing systems are the responsibility of the Contractor. Install permanent fire walls, fire barriers and fire protection systems, if provided as part of the work, as

soon as practical and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material.

2. Solid fuel salamanders and heaters shall not be used by the Contractor or any of its subcontractors. For all other salamanders used by the Contractor or any of its subcontractors, attend to their operation with competent persons in each space where in use.
3. All temporary fabric used by the Contractor or any of its subcontractors for curtains, awnings or other uses shall be either non-combustible or flame retarded so that it will not burn or propagate flame.
4. Fire Watch Requirements
 - a. This section applies to the work in this contract, if any, that 1) disables any fire suppression systems, standpipes systems, fire alarm systems, fire detection systems, smoke control systems and/or smoke vents as defined in Chapter 9 of the Fire Code of New State (FCNYS) or 2) involves welding, cutting, grinding, open torches and other hot work as defined in Chapter 26 of the FCNYS and / or 3) involves demolition activities that are hazardous in nature as defined in the applicable provisions of the Fire Safety During Construction and Demolition chapter of the Fire Code of New York State (FCNYS) in the New York State Uniform Fire Prevention and Building Code. In accordance with Section 901.7 of the FCNYS, for structures that have campus occupancy, either provide a fire watch or perform the work during the hours where the building is scheduled by the campus to be closed. If a fire watch is required, provide all labor that is required. The Contractor shall:
 - 1) Contact the New York State Department of State Office of Fire Prevention and Control (OFPC) at Phone: (518) 474-6746, by email: fire@dhses.ny.gov and obtain its currently amended recommendation for fire watch procedures. Review the OFPC recommendations and notify the consultant if there are significant discrepancies with the requirements of this section.
 - 2) Review the fire watch procedures with the Campus Fire Prevention Program Superintendent, campus alarm monitoring staff, and the fire department prior to disabling a fire protection system. Submit the plan for the fire watch for approval by consultant and campus, and schedule pre-system shutdown meeting with consultant, campus and Fund. The plan should describe how false alarms will be managed and who will be responsible for fire and police departments costs for responding to false alarms..
 - 3) Employ, instruct and maintain competent fire watch personnel. Provide the sufficient number of dedicated personnel that are required to patrol all portions of the means of egress system in the facility in the period of time required.
 - 4) Notify the campus alarm monitoring staff prior to and at the conclusion of the fire watch.
 - 5) Notify the local fire and police departments that the system is "Out of service" and again when the system has been repaired or restored to service.
 - 6) Employ competent personnel to fix the fire protection system(s).
 - b. Fire Watch Duties: Personnel serving as a fire watch have the following duties:
 - 1) Conduct periodic patrols of the entire facility as specified below.
 - 2) Identify any fire, life or property hazards or the warning signs of fire.

- 3) Notify the campus alarm monitoring staff and the fire department if a fire is discovered by calling 911 with the exact address and type of emergency.
 - 4) Notify occupants of the facility of the need to evacuate. If the sirens or public address function of the alarm system are still functional, use them to assist with evacuation of the building.
 - 5) Have access to at least one means of direct communication with the fire department. A telephone is acceptable.
 - 6) Maintain a written log of fire watch activities
 - 7) Have knowledge of the location and use of fire protection equipment, such as fire extinguishers. (Note: The fire watch will not perform fire-fighting duties beyond the scope of the ordinary citizen.)
 - 8) Perform no other duties that are not directly part of the fire watch duties.
- c. Frequency of Inspections: Fire watch personnel should patrol the entire facility every 30 minutes except in the following situations, where patrols shall be every 15 minutes:
- 1) The facility has people sleeping.
 - 2) The facility is an institutional occupancy.
 - 3) The facility is an occupied assembly or educational occupancy.
- d. Record Keeping: A fire watch log should be maintained at the facility. The log should show the following:
- 1) Address of the facility
 - 2) Times that the patrol has completed each tour of the facility
 - 3) Name of the person(s) conducting the fire watch.
 - 4) Record of communication(s) to the fire department and monitoring company.

01 51 23 Temporary Heating and Cooling

1. The Contractor shall provide and pay for all temporary heating, cooling and ventilation, coverings and enclosures necessary to properly protect all work and materials against damage by dampness and cold, dry out the work, and facilitate the completion thereof. The equipment, materials, operating personnel and the methods used therefor shall be at all times satisfactory to the Consultant and adequate for the purpose intended. The Contractor shall maintain the critical installation temperatures, provided in the technical provisions of the specifications hereof, for all work in those areas where the same is being performed.
2. Provide temporary heating and cooling air conditioning unit and connect to existing rooftop unit system during replacement. Temporary unit shall connect to existing ductwork by temporary flex ductwork. Connect temporary unit to existing building management system, thermostat and humidistat during construction. Contractor shall be responsible for all installation and removal of temporary unit.
3. The maintenance of proper heating, cooling, ventilation and adequate drying out of the work is the responsibility of the Contractor and any work damaged by dampness, insufficient or abnormal heating or cooling shall be replaced to the satisfaction of the Consultant by and at the sole cost and expense of the Contractor.

4. After the Project is enclosed, the Contractor shall provide all necessary, temporary heating and cooling for the efficient and effective work by itself and all trades engaged in the work. Unless otherwise specified, the minimum temperature shall be 50°F at all places where work is actually being performed within the enclosed Project
5. As part of the base bid, for ambient exterior weather conditions, include conditions up to the 90th percentile coldest recorded seasonal conditions and accumulated degree days recorded at the nearest National Weather Service site.
6. "Not Used"

01 51 26 Temporary Light

Electrical lighting, as/if it exists within the work area, is available to the contractor at no cost. The minimum temporary lighting level to be maintained at stairs and exit corridors is 1/4 watt per square foot and it will be maintained for 24 hours, 7 days per week; in all other spaces, temporary lighting at the same level is to be maintained during working hours. If the existing lighting does not meet the aforementioned requirements, the Contractor shall supplement or supply the same, maintain it during the construction period, and remove it at the conclusion of the project, at its cost. Such lighting shall be Underwriter's Label temporary lighting sockets, light bulbs, and intermittent power sockets as approved by the Consultant. Installation shall be in accordance with the National Electric Code and the Fire Code of New York State. The Contractor shall install, maintain and, when necessary as a result of construction progress and at the completion of all work or at such earlier time as the Consultant may approve, remove pigtailed type Underwriter's label lighting sockets, light bulbs and intermittent power sockets. The temporary lighting requirements shall be installed in the structure as soon as the frame is completed and work begins on the enclosing walls. The minimum temporary lighting to be provided is at the rate of one-quarter watt per square foot, is to be maintained in each room and changed as required when interior walls are being erected. The required temporary lighting must be maintained for twenty-four (24) hours a day and seven (7) days a week at all stair levels and in all corridors below ground; in all other spaces temporary lighting is to be maintained during working hours.

01 51 36 Temporary Water for Construction Purposes

Water for construction is available through the campus system without charge to the Contractor from location designated by the College. The Contractor shall obtain the necessary permission, make all connections, as required, furnish and install all pipes, fittings and reduced pressure zone backflow prevention device (tested before use), insulate piping, and remove the same at completion of work. The Contractor must provide for waste water discharge and shall take due care to prevent damage to existing structures or site and the waste of water. All pipes and fittings must be maintained to the satisfaction of the campus at all times. Temporary water system shall comply with the Fire Code of New York State.

01 52 13 Field Office

1. For Consultant: The consultant will utilize the existing SUCF trailer.

2. For Contractor: Use of building interiors for contractor field office is not permitted. If a field office is needed, the prime contractor shall provide such on the east side of the Faculty Office Building in existing handicap parking spaces. There shall be enough space around field office for fire truck and emergency vehicles to pass. Contractor shall coordinate fencing accordingly.

01 52 19 Temporary Sanitary Facilities

1. The Contractor shall install, maintain and, at the completion of all work or at such earlier time as the Consultant may approve, remove temporary sanitary facilities. From the commencement of work until the frame of the structure, if the Project involves a structure, is erected, such facilities shall be of the chemical type, shall be placed at locations approved by the Consultant and shall be screened from the campus population. As soon as the frame of the structure has been erected, water supply and sanitary drainage connections shall be promptly made by the Contractor and temporary toilets, using the permanent piping system of the structure, shall be installed by the Contractor and maintained by it until completion, at which time they are to be removed by it. Permanent toilets and room finishes installed under the Contract shall not be used during construction of the Project unless the Contractor has an approved plan for periodic custodial services that maintain toilets and finishes in like new condition until their acceptance by the Fund.
2. The amount of sanitary facilities required shall be based on the total number of workers employed on the Project and shall be in accordance with the provisions of the Health and Sanitary Codes of the State of New York. Maintain all units in a clean and sanitary condition. At the minimum, clean on a weekly basis, and more often as required by the applicable sanitary codes for this occupancy. Provide all toilet supplies as required, including toilet paper, soap, paper towels, and waste receptors.

01 54 13 Use of Elevator(s) for Construction

1. The use of elevators for construction shall not be permitted.

01 55 19 Temporary Parking

1. Unless otherwise specifically noted, there is no free parking available on site. The Contractor and its employees shall be subject to all the rules and regulations of the SUNY campus, including parking regulations. Parking violations are subject to fines and are the sole responsibility of the Contractor or its employees. Parking within contract limit lines as shown on the drawings will be at no cost for the Contractor and its employees. However, if there is not enough space for all its employee parking and /or its employees choose on their own to use campus parking spaces, additional Contractor employee parking may be permitted and arranged within Campus parking lots on a limited basis, as approved by the Campus and subject to applicable campus traffic regulations and parking fees.
2. All vehicles are required at all times to be registered with the Campus' Public Safety Unit. Campus roads are subject to the New York State Vehicle and Traffic Laws, which shall be followed at all times by the Contractor's vehicle operators. All unlicensed work vehicles used by the Contractor shall be moved on campus roads through one of the following methods only:

- a. Escort the unlicensed vehicle with two licensed vehicles with flashers, one in front and one behind the unlicensed vehicle.
 - b. Transport the unlicensed vehicle on a licensed flatbed or other licensed transport vehicle.
3. All costs associated with temporary parking, both direct and indirect, shall be considered included in the base bid. Costs may include staging area improvements, permits, wage premiums, and contractor time, labor, effort, etc.

01 55 26 Traffic Control during Construction ("Not used")

01 55 29 Staging Area and Storage of Materials

1. The Contractor shall store materials and equipment within the Contract Limit Lines as designated on the drawings or as approved by the Consultant, and in compliance with the Fire Code of New York State. Sequence and manage the work to account for the extremely limited space for storage and work related activities provided in the available staging area.
2. All materials shall be stored in a neat and orderly manner, and shall be protected against the weather by a weatherproof temporary storage facility or trailer. Protect material during shipping against any damage from weather, including road salt.
3. Security for stored materials shall be the responsibility of the Contractor.
4. Storage of materials is not permitted on the roof of any building.
5. The Contractor, at its expense and in compliance with the Fire Code of New York State, will be permitted to place its storage, trailer/field office(s) with appropriate utilities, and other temporary structures within the Contract Limit Lines as indicated on the drawing or as approved by the Consultant. Prior to installing and/or relocating any such structure, provide a layout showing separation distances in accordance with NFPA 241, Table 4.2.1.
6. Access to the construction site for delivery of materials and equipment shall be as indicated on the drawings or as approved by the Consultant. Temporary parking for the loading and unloading of the same shall be arranged with prior approval of the Campus.
7. The Contractor shall, at all times, keep access routes, and parking and staging areas clean of debris and other obstructions resulting from the work.
8. If petroleum products are brought on campus in stationary containers of 55 gallons or larger, the Contractor shall provide a certification to the campus, stamped by a professional engineer currently licensed in New York State, that product storage, spill prevention, training, testing, inspections, handling and dispensing methods are in compliance with all applicable federal and state rules and regulations, including EPA rule 40 C.F.R. Part 112. The campus may add the contractor's certification(s) to their Oil Spill Prevention Control and Countermeasure (SPCC) Plan

as an amendment. This certification shall be provided to the Fund two weeks ahead of any product or container(s) delivery and the campus shall be notified promptly of the removal of any container(s).

9. Prior to utilization on this project, the locations of cranes, mixers, boom trucks, forklifts, welding machines, generators, field offices, workbenches, cutters, hose lines, etc., must be reviewed in a pre-installation meeting with the Consultant. In addition, submit a complete lifting procedure safety plan, operator's license, an annual inspection report, and a current inspection certificate for each crane, boom or lift proposed. Prior to and during any lifting, properly erect, remove, maintain and replace any required safety and/or traffic barriers.
10. Provide a chain link fence around staging, storage, parking, etc. areas that is 8'-0" high. Cover all fence fabric with black closed mesh woven polypropylene with 95% blockage, and finished with binding and grommets. Reinforce posts and add additional posts and braces as required to support the additional wind load created by installation of the fabric. Secure fabric at 2'-0" by 2'-0" grid intervals and inspect and repair all attachments points monthly. Tears or holes greater than 6" in one dimension shall be repaired weekly. Minimum post size shall be as required for a 70 mph wind. Gates shall be a minimum of 20 feet across, double swing leaves with a drop rod to secure them in place while in the closed position. All gates shall include heavy duty padlocks, keyed alike, with 10 spare keys for each given to the Consultant for distribution. Provide continuous top and bottom rails. All areas within the fence shall have all grass, weeds, etc. mowed when it exceeds 6" in height. Contractor shall clear snow as necessary within fenced areas. Snow from within the fenced areas shall be moved outside the fenced areas, transported and legally disposed of offsite. Snow outside the Contract Limits will be removed by the campus. Set fence posts and supports in the manner that facilitates the removal of snow by the campus. True and plumb the fence posts on a monthly basis.
11. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated. The use of drone(s) during work on site is contingent on written approval from the campus.
12. Contractor shall clear extraneous matter (snow, precipitation, wind bourn organic matter, bird/animal carcasses, etc.) from work areas as necessary to perform work. Extraneous matter from within the work areas shall be moved outside the work areas, transported and legally disposed of offsite. Extraneous matter outside the Contract Limits will be removed by the campus.
13. Contractor shall clear the pedestrian walkways & access ways of snow along all perimeter locations. Contractor is also responsible for keeping clean and year round maintenance of all temporary pedestrian walkways surrounding the project site. Snow outside the above areas and Contract Limits will be removed by others. Snow removal must be completed no later than 6:30 am each day (Off-hour work shall be included at no additional charge).
14. This Contract includes the off-site storage costs of any material or equipment until the building is sufficiently complete to receive that material or equipment.

01 56 19 Noise Mitigation Measures

Employ the following measures during the work of this contract:

1. Maintain all construction tools and equipment so that they operate at normal manufacturer's operating specifications, including at peak loading. Maintain noise created by tools and equipment below the levels in the noise level guidelines in the Federal Highway Administration Roadway Construction Noise Model User's Guide, as currently amended, page 3 (the Guide). If an individual piece of equipment exceeds the level specified in the Guide, then either perform maintenance to demonstrate a good faith effort, notwithstanding the model year of the equipment, to mitigate the noise by a measurable level acceptable to the Consultant, or replace the equipment with equipment that complies with the level in the Guide.
2. Equip all tools and equipment being operated on site with the appropriate manufacturer's recommended noise reduction device(s), including a muffler and jacket, free from air or exhaust leaks.
3. Equip specialized vehicles with noise-insulating material that does not interfere with the engine operation and/or other manufacturer recommended techniques to reduce noise. Prevent all unnecessary vehicle engine-idling on site. Equip all vehicles with the installation of quieter backup warning devices where permitted by OSHA.
4. Cover portable compressors, generators, pumps and other such devices with noise-insulating fabric, employed so as not to interfere with engine operations, or employ other manufacturer recommended techniques to reduce noise.
 - a. Implement a formal noise mitigation training program for all field-worker supervisory personnel including sub-contractor supervisors. Supervisory personnel shall field-train all field workers in an effort to minimize construction noise.
 - b. Cooperate with the Campus to coordinate the work whenever possible so as to minimize the impact on the facility and use quieter devices and other noise mitigation methods, such as blankets and barriers.

01 57 23 Storm Water Construction Permit Responsibilities ("Not used")

01 58 13 Project Sign ("Not Required")

1. No Contractor identification signage shall be erected or hung from fencing or other construction without the approval of the Fund. Contractor shall provide specific text, size, location, and number of signs for approval of the Fund.
2. The Contractor shall furnish, erect and maintain, at the site of the work, the exact location thereof to be designated by the Consultant, a construction sign, in the form prescribed by the Contract Documents, containing the title of the Project, the Fund's name, the names of the Consultant, Contractor and subcontractors engaged in work on the Project and such other data and information as may elsewhere be prescribed in the Contract Documents.

01 60 00 10 U.S. Steel

All structural steel, reinforcing steel, or other major steel items to be incorporated in the work shall, if this Contract is in excess of \$100,000, be produced or made in whole or substantial part in the United States, its territories or possessions. Upon request from the Consultant, provide information from suppliers, fabricators and installers identifying the place of manufacturer and the country of origin for all steel items incorporated into the work.

01 60 00 20 Non-Asbestos Products

1. All materials specified herein shall contain no asbestos.
2. Provide "Contains No Asbestos" permanent labels applied to the exterior jacket of all pipe insulation at 20 foot intervals with a minimum of one (1) label for each service in each work area.
3. The use of vermiculite in products and systems installed in the work is acceptable if the product /system manufacturer provides the MSDS sheet showing that no asbestos is present and submits a certification of the origins of the vermiculite showing that it is not from a mine contaminated with asbestos.

01 60 00 30 Products

All products shall be new and installed on the project within one year of manufacture, and no recycled, reconditioned, or reused products shall be used unless expressly noted otherwise in the technical specifications.

01 64 00 Campus-Furnished Products ("Not Used")

01 66 00 Equipment Storage and Handling Requirements

1. In addition to the requirements of the technical specifications and Sections 4.13 and 4.14 of the Agreement, for equipment that is stored, delivered and/or installed for work not yet accepted by the Fund, provide and maintain a preventive maintenance log (Log) documenting maintenance activities performed. (See Sections 4.13 and 4.14 of the Agreement, which requires the Contractor to perform these maintenance activities.)
2. In the Log, list equipment individually. For equipment listed, list the manufacturers' recommended maintenance activities; recommended maintenance tools, lubricants, parts and other items needed to perform maintenance; recommended frequency for performing maintenance activities; the qualifications of the workers performing the maintenance activity; anticipated/scheduled dates for performing the maintenance activity; the actual date the maintenance activity was performed; the name of the Contractor's employee who supervised performance and other information requested by the Consultant. See sample layout below:

preventive maintenance log									
Equipment	manufacturers' recommended maintenance activities	maintenance tools, lubricants, parts and other items	frequency of activity	qualifications of the workers	anticipated/ scheduled dates	actual date performed	Name of supervisor	Other	Comments
Item name	Lubricate lubrication points	ISO Grade 32 synthetic lubricant	after each 50 hours of use	Trained in accordance with manufacturer's guidelines	xx/xx/xxxx	xx/xx/xxxx	Mr. Contractor		May need to perform every 25 hours due to jobsite environmental conditions

- a. Prior to delivery of equipment to the site or storage location, submit the Log to the Consultant for approval.
- b. After delivery of equipment, upon periodic requests of the Consultant, submit the Log for inspection and review.
- c. Prior to acceptance of equipment, submit the Log showing all maintenance activities completed for the equipment proposed for acceptance.
- d. Provide timely notification and access for the Consultant and the Fund to witness any preventive maintenance activities listed in the Log.

In addition to the above maintenance, where equipment or systems are used during construction for temporary purposes (such as heating, cooling, or other construction uses), provide additional maintenance, cleaning and other activities recommended by the manufacturer for the environmental conditions in which their equipment operates

01 71 23 Field Engineering

1. In addition to Section 2.24 of the Agreement, employ an independent Land Surveyor (a person not in the regular employment of the Contractor or having any vested interest in the Contractor's business), licensed to practice in the State of New York, for the duration of the Work, to supervise and certify the accuracy of the survey work, including the following:
 - a. During the work, submit progress copies for use in Section 1C "Coordination Drawings" and when requested by the Consultant. Upon completion of the Work, submit a certificate signed and sealed by the Land Surveyor, stating that the elevations and locations of the Work are in conformance with the Contract Documents.
 - b. Maintain a complete and accurate log of control and survey work as it progresses. Utilize recognized engineering survey practices. Furnish all tools, equipment, and materials required to perform the work.
 - c. Verify locations of control points prior to starting work. Control datum for survey is indicated on the Drawings. Confirm permanent survey markers to be used as bench marks for vertical control on the Site where indicated on the Drawings and referenced to established control points. Record locations, with horizontal and vertical data to within one one-hundredth of a foot, on Project Record Documents.
 - d. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means.

2. Survey and record locations of site improvements including utility locations and invert elevations and
 - a. Power distribution and drainage structures: provide as built inverts at each end of each pipe or conduit.
 - b. Pipes and conduits ending without structures: provide as built inverts at each end of each pipe or conduit.
 - c. Structures: as built centerlines and frame elevation.
3. Survey and record locations of building improvements within one week of erection, or as approved by the consultant, including:
 - a. In all multiple-story construction, the Contractor shall establish and maintain line marks at each floor level and grade marks four (4) feet above the finished floor at each floor level.
 - b. Grid, perimeter and axis for structures.
 - c. Building foundation perimeter, column locations, and floor, roof, pit and sump elevations.
 - i. Provide as built centerlines and perimeter of columns and piers.
 - ii. After the placement of concrete on each level, provide spot elevations on each level on each point of a 10-foot by 10-foot grid starting at the northeast corner of each floor. Show contours at one tenth of a foot where applicable.
 - iii. Perimeter of all floor opening locations relative to structural grid.
 - iv. After completion of the roofing membrane, provide spot elevations on each level on each point of a 10-foot by 10-foot grid starting at the northeast corner of the building. Show contours at one tenth of a foot where applicable.
 - d. Inverts of foundation and under drain piping at sumps and cleanouts.
 - e. For horizontal storm drainage piping suspended below decks, underside elevation spaced at not more than 10 feet on center.

01 71 36 Non-Destructive Building Examination

Prior to drilling, coring, cutting or demolishing existing or previously installed substrates, such as concrete and masonry, employ an experienced firm to investigate and locate items concealed in substrates that may be impacted by the work. Locate items such as reinforcing bars, tendons and other structural steel; conduits, piping, ducts and other concealed trade work; voids, substrate thickness and layers; and other concealed conditions within the substrates. Locate by scanning existing substrates with a radar system having a 2.7 GHz antenna (or equivalent system appropriate for the work). As concealed items are discovered and as needed to coordinate with new work, mark out location of such items on the substrate surfaces. Record and save all electronic data acquired during the scanning. If conditions are discovered that differ substantially from those anticipated, provide all electronic data to the Consultant with the notice required by Section 2.12 of the Agreement.

01 73 00 10 Information required for Rebates, Grants, Awards and/or other Programs

In addition to Section 4.11 of the Agreement, for the work listed below, provide invoices, receipts and other documents from suppliers, subcontractors and others to whom the Contractor has allotted any portion of the work. Such invoices, receipts and other documents shall be originals as provided by the suppliers, subcontractors and/or others. In addition, all invoices, receipts and other documents shall have the complete and proper information required for the applicable rebate, grant, award or other program. To avoid withholding of progress payments, submit samples of invoices, receipts and other documents showing the required information and revise samples as directed by the Consultant.

Section 01 73 00 10 applies to the following work:

“Not Applicable”

01 73 29 Cutting, Patching and Repairs

1. The Contractor shall do all cutting, fitting, and patching of its work that may be required to make its several parts come together properly and fitted to receive or be received by work of other Contractors as shown upon or reasonably implied from the Drawings and Specifications for the completed project.
2. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefor. Except as otherwise expressly provided in the Contract Documents, the Contractor shall not cut or alter the work of any other Contractor or existing work without the consent of the Consultant and the Fund.
3. Existing construction finishes, equipment, wiring, etc., that is to remain and which is damaged or defaced by reason of work done under this contract shall be restored by the Contractor to a condition satisfactory to the Fund, or replaced with new, at no additional cost.
4. Existing surfaces, materials, and work shall be prepared as necessary to receive the new installations. Such preparatory work shall be as required by the conditions, and in each case shall be subject to approval by the Consultant and the Fund.
5. Newly exposed work or surfaces which are presently concealed shall be made to match existing corresponding or adjoining new surfaces as directed, and the materials and methods to be employed shall be subject to approval by the Consultant and the Fund.
6. All new, altered, or restored work in the building shall match existing corresponding work in the material, construction finish, etc., unless otherwise specified or required by the drawings.
7. Holes, openings, gaps and voids created by removals shall be filled solid to match existing corresponding or adjoining new surfaces as directed, and the materials and methods to be employed shall be subject to approval by the Consultant and the Fund.

8. Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load-deflection ratio. Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
9. If possible retain the original installer or fabricator employed under this contract to repair, cut and patch exposed work or, if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm acceptable to the Consultant.
10. Where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required to minimum disturbance of adjacent surface. Temporarily cover openings when not in use. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
11. Where removal of walls or partitions extends one finished area into another: Patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance; Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance. Where patching occurs in a smooth painted surface: extend final paint coat over entire unbroken surface containing the patch, after the patched area has received.
12. Where the extent of patching of portions of the Project is significant and the need for this significant patching is due to the Contractor's means and methods, skill and labor, equipment operations, sequence of trades, lack of temporary protective facilities and/or other actions during the performance of the work, then the significant patching shall be replaced with new work.
 - a. The Consultant will determine if patching must be replaced with new work using the following process.
 - i. Step 1: The Consultant will evaluate the risks associated with the Patching (such as water or water vapor infiltration into the work), the esthetic impact of visible Patching, the impact that Patching has on future maintenance, custodial or other campus operations and/or other objective criteria that it may deem reasonable during the evaluation of the Patching. Based on this evaluation, the Consultant may recommend moving on to Step 2.
 - ii. Step 2: The Consultant will count and measure the amount of Patching using the most reasonable unit of measurement applicable. The sum of these counts and measurements will be the total amount of Patching.
 1. The Consultant will determine the overall limits (Limits) of the portion of the Project with the Patching. The Limits will include all the Patching counted and measured above plus reasonably adjacent portions of the Project that may be without Patching.
 2. The Consultant will measure the Limits using same unit of measurement used to measure the Patching. This quantity will define the extent of the Limits of the portion of the Project with the Patching.

3. Using the figures calculated above, the Consultant determines the number of Patches and the percentage of Patching that exists within the Limits. The work within Limits shall be replaced with new work if:
 4. If the number count of Patches within the Limits exceeds 2 (two) per 100 (one hundred) square feet (or other appropriate unit of measurement), or
 5. If the percentage of Patching exceeds 15% (fifteen percent) within Limits.
- b. The Consultant will determine the reasonable extent and type of work required to replace the Patching and issued detailed drawings and instructions to the Contractor for its use in completing the corrective work.

01 74 00 Clean-Up

1. Periodic Cleaning: The Contractor shall at all times during the progress of the work keep the Site free from accumulation of waste matter or rubbish and shall confine its apparatus, materials and operations of its workers to limits prescribed by law or by the Contract Limit Lines, except as the latter may be extended with the approval of the Consultant and the Fund. Provide cleaning and waste disposal in accordance with the Fire Code of New York State and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material. Cleaning of the structure(s), once enclosed, must be performed daily and removal of waste matter or rubbish must be performed at least once a week unless more frequent performance is required by NFPA 241 and recommended in its Annex A, Explanatory Material.
 - a. If open topped dumpsters are within 35 feet of any structure, empty and remove combustible contents from these dumpsters at the end of each shift.
 - b. Provide periodic pest and vermin control as required to deliver the completed building completely free of any infestation.
 - c. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
 - d. Prior to installation of ceilings, inspect all above ceiling areas and leave the completed above ceiling work and areas without the need of further cleaning of any kind and with all work in new condition and perfect order.
 - e. In addition to and in coordination with testing and cleaning specified in Divisions 2 through 48 inclusive, periodically flush and clean air and fluid systems in portions (sections) as the work is installed.
 - i. Submit a flushing and cleaning plan to the Consultant for approval prior to beginning installation of a system.
 - ii. Unless otherwise approved by the Consultant, select portions of systems for cleaning in a manner that limits the maximum size of a portion cleaned in a single effort to an individual riser, to individual floor system and to not more than 1,000 linear feet in length of the installed portion of a riser or individual floor system, whichever is less.

- iii. Where portions of systems are excluded from the portions being cleaned, provide all additional work required to functionally extend systems around the excluded and/or uncompleted portions and to fully separate the portions being cleaned from the excluded and/or uncompleted portions.
 - iv. Unless otherwise approved by the Consultant, fully separate fixtures, appliances, and equipment from the portions being cleaned by providing all additional work required to functionally extend systems around the excluded fixtures, appliances, and equipment and to fully separate the portions being cleaned from the excluded fixtures, appliances, and equipment.
 - v. Provide temporary means for providing and moving air and/or fluid at the rate required to flush and clean the portions of systems being cleaned unless use of permanent equipment is specifically approved by the consultant. If the permanent equipment is permitted to be used, provide a letter from the manufacturer's technical representative agreeing to such use, stating that its use shall not limit their warranty and excluding the time their system is used from the project specific warranty period. See 01 78 36, Warranties, for additional requirements.
 - vi. Capture, treat and legally dispose of air and fluid discharges, effluent and any materials cleaned from a systems or portions of a system. When approved by the consultant, the campus sanitary system may be used to convey discharges if the local treatment facility provides written confirmation to the Contractor that it will accept such discharges.
 - f. In addition, during the course of the work, the Contractor shall remove dust, debris, rubbish, and other materials scattered and dispersed from its work area into other spaces, sites, equipment or materials owned or controlled by others. Engage qualified firms and competent workers to restore the use or appearance of such spaces, sites, equipment or materials to their original condition and to the satisfaction their owner or controller. If such scattering or dispersal occurs, provide qualified workers during all periods of subsequent work to provide daily monitoring, containment, continuous cleaning, and other actions or modifications to work activities as required to mitigate future scattering or dispersal.
 - g. Provide and maintain sweeping compound to assist in daily cleanup as needed for the duration of the project. Provide, maintain and replace as necessary general use construction push brooms (soft bristle), construction push brooms (course bristle), heavy-duty, flat edge shovels and dustpans.
3. Final Clean Up: Upon completion of the work covered by the Contract, the Contractor shall leave the completed project ready for use without the need of further cleaning of any kind and with all work in new condition and perfect order. At least two weeks prior to the start of Final Clean Up, submit a written implementation plan describing cleaning methods, staff, sequence and schedule of activities and other information requested by the Consultant. In addition, upon completion of all work, the Contractor shall remove from the vicinity of the work and from the property owned or occupied by the State of New York, the State University of New York or the Fund, all plant, buildings, rubbish, unused materials, concrete forms and other materials belonging to it or used under its direction during construction or impairing the use or appearance of the property and shall restore such areas affected by the work to their original condition, and, in the event of its

failure to do so, the same shall be removed by the Fund at the expense of the Contractor, and it and its surety shall be liable therefor.

01 74 16 Payment for Planting Maintenance

Not applicable

01 74 19 Construction Waste Management

1. In addition to the requirements of the above Sections 01 35 13, Conducting Work, and 01 74 00, Clean Up, provide and manage a project specific Construction Waste Management Plan (the Plan). The Plan shall have reasonable criteria for recycling and/or salvaging demolition and construction waste generated during the project. The plan shall demonstrate at good faith effort to meet the Campus' goal (the Goal) of recycling at least 50% of the construction and demolition waste generated by this contract.
 - a. Provide the proper labor, equipment and other means for collecting, separating, monitoring, storing, processing, transferring, tracking and transporting waste from the point of creation during the project to the point of its final disposition off the site of the Project.
 - b. The Plan shall outline the means and provisions for separating, recycling and salvaging demolition and construction waste generated during the project. Modify and resubmit the Plan periodically as needed to suit the field conditions of the site that may not have been anticipated in the original submission. The Plan will have a Waste Management Form (in Microsoft Excel) for written reporting on and accounting for all materials transferred from the project site.
 - c. Demolition and removal work on campus shall be limited to the minimum work required to create a debris stream that allows for reasonable handling and transport. Additional work on debris material, such as grinding, cutting or crushing, which may be desired by the Contractor to make the material ready for reuse off-site, shall be performed off-site.
 - d. Prior to generating construction waste, submit the project specific Plan for approval by the Consultant and provide monthly written reports on the progress of the Plan.
 - e. Upon approval of the Plan by the Consultant, it shall be implemented for the duration of the project.
 - f. Any money received by the Contractor for materials recycled, sold or reused off site was considered when the Bid Proposal submitted to the Fund and may be retained by the Contractor. The Contractor is solely responsible for the security of any materials that may be recycled, sold or reused.
2. The Plan shall include, but not be limited to, the following components:
 - a. A list of the waste materials from the Project that will be targeted for reuse, salvage, or recycling. The following materials, as applicable to the project, shall be accounted for (materials that will not be recycled shall be indicated as such):
 - i. Cardboard, paper, packaging.
 - ii. Acoustical Ceiling Tiles.

- iii. Clean dimensional wood, pallet wood.
 - iv. Beverage containers.
 - v. Land clearing debris.
 - vi. Concrete.
 - vii. Stone.
 - viii. Concrete Masonry Units (CMU).
 - ix. Asphalt.
 - x. Metals, such as from banding, stud trim, ductwork, piping, rebar, roofing, windows, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - xi. Gypsum board.
 - xii. Carpet and pad.
 - xiii. Paint.
 - xiv. Asphalt roofing shingles if applicable for any existing building demolition.
 - xv. Rigid Foam.
 - xvi. Glass.
 - xvii. Plastics.
 - xviii. Woods.
 - xix. Other materials required by regulations and/or requested by the Consultant
- b. Provide a description of the proposed means of waste management, including collecting, sorting and transporting the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site for off-site sorting).
 - c. If the waste management work is assigned in whole or part to a subcontractor, vendor or other entity, provide a description of who does what from the point of creation during the project to the point of its final disposition off the site of the Project.
 - d. Provide an estimate of packaging materials generated, and note whether suppliers will eliminate or take back packaging at time of delivery.
 - e. Provide the name and address of the landfill(s) where trash will be disposed of and the applicable landfill tipping fee(s).
 - f. Provide the name and address of the recycling facilities(s) where materials will be sent for recycling, how it will be recycled, and the applicable fee(s) paid or payment(s) received.
 - g. Include any additional information deemed relevant to describe the scope and intent of the Plan to the Consultant.
 - h. Provide documentation for materials or equipment to be removed from the site for sale or reuse, or turned over to the Campus, which are classified as recycled materials. Documentation shall include the description of the materials or equipment, weight or quantity of materials or equipment, and a receipt for the sale, a letter on Contractor's letterhead indicating the reuse or the Campus' signed receipt of materials or equipment, and the applicable fee(s) paid or payment(s) received.
3. In conjunction with payment applications, submit a monthly Waste Management report. This report shall include copies of waste receipts for the payment period and a completed Waste Management Form for the same payment period in PDF, paper (four copies) and Excel formats.

4. Calculations and supporting documentation to demonstrate end-of-project recycling rates meeting the requirements of the Construction Waste Management Plan. The process for recording and assembling documentation shall be as follows:

- a. Record and document the total weight (in tons) of all demolition and construction waste materials sent to the landfill. The Waste Management Reporting Forms shall be used as the basis for determining the total amount of waste landfilled for the project. The monthly reporting forms shall specify:
- i. The number of dumpsters or other containers sent to the landfill for that month.
 - ii. The volume (in cubic yards) of each dumpster or container sent to the landfill for that month.
 - iii. The type of waste contained in each dumpster or container.
 - iv. The weight of the waste in each dumpster or container. If the weight of the waste is not directly measured for each dumpster or container, the following Solid Waste Conversion Factors shall be used to convert the volume of waste to weight:

Solid Weight Conversion Factors	
Mixed Waste	350 lbs/cubic yard
Wood	300 lbs/cubic yard
Cardboard	100 lbs/cubic yard
Gypsum Board	500 lbs/cubic yard
Rubble	1,400 lbs/cubic yard
Steel	1,000 lbs/cubic yard

- v. In addition, provide the name of the landfill that will be accepting the materials. Receipts or other equivalent proof of facility reception of materials is required.
- b. Record and document the total weight (in tons) of all demolition and construction waste materials recycled or salvaged. Monthly Waste Management Reporting Forms shall be used as the basis for determining the total amount of waste recycled or salvaged for the project. The monthly reporting forms shall specify:
- i. The number of dumpsters or other containers of recycled or salvaged materials for that month.
 - ii. The volume (in cubic yards) of each dumpster or container of recycled or salvaged materials for that month.
 - iii. The type of recycled or salvaged material contained in each dumpster or container.

- iv. The weight of the recycled or salvaged material in each dumpster or container. If the weight of the material is not directly measured for each dumpster or container, the Solid Waste Conversion Factors listed for landfill waste above shall be used, where applicable, to convert the volume of material to weight. For materials not contained in the Solid Waste Conversion Factors above, propose a conversion factor for review by the Consultant.
 - v. In addition, provide the name of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials. Receipts or other proof of facility reception of materials is required.
 - vi. For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the Plan for the Consultant review and approval.
 - vii. Summarize and show current progress to date in meeting the contract specific Goal specified in paragraph 1 above.
 - c. Calculate the end-of-project recycling rate percentage by dividing the recycled and salvaged waste (in tons) by the total waste generated (recycled, salvaged, and landfilled waste – also in tons), and multiplying by 100.
 - d. For materials turned over to others for reuse, provide documentation on company letterhead indicating the material(s), the quantity (either by weight or units), the date and the intended reuse of the product.
5. During the work of the Project, provide all labor, containers, bins, dumpsters, and other equipment for the proper removal of all waste, non-returned surplus materials, and rubbish from the site in accordance with the Plan. Oversee and document the results of the Plan. Monitor the collecting, sorting, and depositing of all waste, non-returned surplus materials, and rubbish, in designated areas as per the Plan.
- a. Locations for removal containers, bins and dumpsters shall be coordinated with the Consultant. Relocate containers, bins and dumpsters as needed to suit the field conditions during the work.
 - b. Provide periodic on-site instruction to workers regarding the appropriate separation, handling and recycling, salvage, reuse and return methods to be used by all parties in appropriate stages of the Project.
 - c. Allow for and lay out a specific area(s) to facilitate separation of materials for potential recycling, salvage, reuse and return. Each potential material shall be collected and stored to avoid being mixed with other materials. Recycling and waste bin areas are to be kept neat and clean, and clearly marked. Relocate area(s) as needed to suit the field conditions during the work.
6. For all construction and demolition waste that leaves campus with a manifest, provide copies of manifests in the monthly reports. For each manifest that requires the Campus EPA ID number as the generator of the waste, submit a draft copy for the review by the campus, make any reasonable corrections that the campus requests, and allow one week for the campus to review and sign each completed manifest.

01 78 23 Operating Instructions and Manuals

1. General

- a. The operating instructions and manuals applicable to this contract must be substantially completed before the Project can be used for the purpose for which it was intended.
- b. The Contractor shall furnish six (6) complete printed sets and PDF/A files of operating instructions and manuals for all mechanical and electrical systems involved in the Contract. Operating instructions and manuals include definite and specific instructions on the proper operation and maintenance of the systems. See Section 23 05 00-1.24. The requirements of this section are in addition to the requirements of Section 01 33 23 Shop Drawings and Samples.
 - i. Furnish sets in phases based on the progress of the work. At no additional cost to the Fund, for products, equipment, systems and installations completed prior to the date of Substantial Completion, obtain and pay for warranty extensions that cover the additional time between the earlier date of their completion and the date of Substantial Completion.
 - ii. Provide PDF/A copies of all submittals (except physical samples) stored and labeled on four (4) sets of archival optical discs, Universal Serial Bus (USB) flash drives or other electronic data storage devices approved by the Consultant that include all documents and tracking logs in a indexed, text searchable, navigable format. PDFs created by scanning are not acceptable unless all images of text are properly and completely transformed into the electronic characters representing the text.
- c. Said instructions and manuals should set forth:
 - i. the manner of operation;
 - ii. the necessary precautions and care to be followed;
 - iii. periodic prevention maintenance requirements; and
 - iv. a complete set of spare parts lists, catalogs, service manuals and manufacturing data on said systems.
- d. Engage a manufacturer authorized service representative(s) to provide and prepare information for each system, subsystem, and piece of equipment.
- e. Submit draft copies of operating instructions and manuals to the Consultant for review and comment in sequence with the commissioning process submittals for the project. If there is no commissioning process specified for this project, submit the draft copies at least six weeks prior to the date the final copies are due.
- f. Provide final copies a minimum of six (6) weeks prior to the date of Substantial Completion or three (3) weeks prior to scheduled training sessions, whichever is sooner.

- g. Final copies shall be complete except for copies of warranties and other items approved by the Consultant for turnover on the date of Substantial Completion.
- h. Unless otherwise approved by the Fund, in the Contract Breakdown required by Section 4.08 of the Agreement, the scheduled value of Contractor provided operating instructions and manuals shall be 5% of the amount estimated for the work covered in the operating instructions and manuals.

2. Deliverables for each complete set include:

- a. Use 8-1/2 x 11 inch text pages bound in capacity expansion binders with durable plastic covers and sides identified with printed titles "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder. 11 x 17 paper may be used if each page is folded three times to fit the 8-1/2 x 11 format.
- b. Organize into sets of manageable size.
 - i. Organize the manual into separate sections by CSI number based on the table of contents of the project manual, for each system and subsystem, and a separate section for each piece of equipment not part of a system. Arrange content within sections alphabetically.
 - ii. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- c. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the binder, and cross-referenced to Specification Section number in Project Manual.
- d. When multiple binders are required, use the same type of binder for each and prepare a printed Table of Contents for each binder, with each product or system description in the binder identified. Also include comprehensive table of contents for all binders in each binder of the set.
- e. Internally subdivide the binder contents with permanent page dividers, logically organized as described below, with tab titles clearly printed under reinforced laminated plastic tabs:

Part 1: Directory, listing names, addresses, email and telephone numbers of Consultant, Contractor, subcontractors, and suppliers.

Part 2: Operation and maintenance instructions, arranged by subdivided by specification section, then by system, then by subsystem, then by equipment. Use designations for systems, subsystems and equipment indicated on Contract Documents. In each subdivision, identify the following:

 - 1. Description of system, subsystem, or equipment, as applicable, including:

- a. Product name and model number. Use designations for products indicated on Contract Documents.
 - b. Manufacturer's name.
 - c. Equipment identification with serial number of each component.
 - d. Equipment function.
 - e. Operating characteristics.
 - f. Limiting conditions.
 - g. Performance curves.
 - h. Engineering data and tests.
 - i. Complete nomenclature and number of replacement parts.
2. In systems and subsystems, a list of equipment, components and parts.
3. Operating instructions and procedures, including:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Instructions on stopping.
 - f. Normal shutdown instructions.
 - g. Seasonal and weekend operating instructions.
 - h. Required sequences for electric or electronic systems.
 - i. Special operating instructions and procedures.
4. Operating standards.
5. Operating logs.
6. Wiring diagrams, as installed.
7. Control diagrams, as installed. Describe the sequence of operation, and diagram controls as installed.
8. Piped system diagrams, as installed and identify color-coding as installed.
9. Precautions against improper use.
10. License requirements, if any, including inspection and renewal dates.
11. Maintenance instructions for operating parts and components. Include manufacturer's written recommendations and the following:
 - a. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - b. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - c. Maintenance and Service Record: Include manufacturers' forms for recording maintenance and inspection.
 - d. Lists of materials, sources of materials and related services.

- e. Standard maintenance and repair instructions and bulletins.
 - f. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - g. Test and inspection instructions.
 - h. Troubleshooting guide.
 - i. Precautions against improper maintenance.
 - j. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - k. Aligning, adjusting, and checking instructions.
 - l. Demonstration and training video recording, if specified.
 - m. Identification and nomenclature of parts and components.
 - n. List of items recommended to be stocked as spare parts with parts identified and cross-referenced to manufacturers' maintenance documentation.
 - o. Prepare supplementary text if manufacturers' standard printed data are not available, applicable or where project specific information is necessary for proper operation and maintenance of equipment or systems.
12. Maintenance instructions for finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
- a. Types of cleaning agents to be used and methods of cleaning.
 - b. List of cleaning agents and methods of cleaning detrimental to product.

Part 3: Project documents and certificates, including the following:

- 1. Approved shop drawings (reduced size copies printed on 11 x 17 paper) and product data.
- 2. Air and water balance reports.
- 3. Photocopies of original warranties (originals submitted per Section 01 78 36, Warranties.)

01 78 36 Warranties

In addition to the requirements of Section 2.25 of the Agreement, provide warranties for products, equipment, systems and installations required by other technical sections of Contract Documents for duration indicated. Warranties shall be individually listed in the project specific submittal log required by 01 33 23, Shop Drawings and Samples.

- 1. All warranties required by Contract Documents shall commence on date / time of Substantial Completion shown on Page A-1 of the Agreement.
 - a. At no additional cost to the Fund, for products, equipment, systems and installations completed prior to the date of Substantial Completion, obtain and pay for warranty extensions

that cover the additional time between the earlier date of their completion and the date of Substantial Completion.

2. Provide a list of all Contractor provided warranties that are specified in Divisions 1 through 48, inclusive, and list who will inspect the work covered by the warranty (if applicable), when it will be done, who witnessed it and when, results (pass/fail), follow up action, comments and other information requested by the Consultant.
 - a. Unless otherwise approved by the Fund, all inspections must be witnessed and signed off by the Consultant prior to acceptance of Contractor provided warranties that are specified in Divisions 1 through 48, inclusive.
 - b. The Consultant will reject a Warranty issued prior to or without the manufacturer's field inspection of the work, if required in Divisions 1 through 48, inclusive.
3. Unless otherwise approved by the Consultant and if required in Divisions 1 through 48, inclusive, the scheduled value of a Contractor provided warranty in the Contract Breakdown required by Section 4.08 of the Agreement shall be 5% of the amount estimated for the work being warrantied.
4. Furnish and organize original warranties in a separate binder with a durable plastic cover. Organize the binder into separate sections by CSI number based on the table of contents of the project manual. Internally subdivide the binder contents with permanent page dividers, logically organized as described below, with tab titles clearly printed under reinforced laminated plastic tabs. Provide a printed Table of Contents.
 - a. Warranties shall be in the form required by the applicable technical sections of Contract Documents. Include procedures to follow and required notifications for warranty claims.
 - b. Warranty Certification: Written certification from the warrantor that the warranty is in effect and non-retractable due to any of the specified conditions. Warranties submitted without warranty certification will not be accepted.
 - c. Deliver the binder to the Consultant with the written notice of Substantial Completion required by Section 2.23(2) of the Agreement.
5. For uncompleted work delayed beyond date of Substantial Completion, provide updated binder submittal within 10 days after acceptance, indicating date of acceptance as start of warranty period for any work delayed beyond date of Substantial Completion.

Applications for payment after the date of Substantial Completion may not be approved until the warranty certification and warranty documents are delivered to the Consultant.

01 79 00 Training of Campus Personnel

1. Training of campus personnel in the use of the work of this Project must be substantially completed before the Project can be used for the purpose for which it was intended. The

information required by Section 01 78 23 Operating Instructions and Manuals is required for training to occur and be completed.

2. The Contractor shall be responsible for training coordination and scheduling and ultimately for ensuring that training is completed. A draft schedule of all training shall be submitted three months prior to any training and finalized one month prior to the actual training. In addition to these general requirements, additional specific training requirements of campus personnel by the Contractor are specified in other the applicable specifications. The Campus will designate the personnel who will be trained and some personnel may not be direct employees of the Campus.
3. The Contractor shall provide individual training sessions for each piece of equipment furnished under this Contract. The Contractor shall provide factory authorized representatives for each training session. Training shall include operation and maintenance, preventative maintenance and troubleshooting. Operation and maintenance manuals shall be furnished to the campus personnel three weeks prior to the associated training session.
 - a. The Contractor shall schedule all training sessions. A minimum of 48-hour notice is required for scheduling. Training for each piece of equipment shall be provided in two separate sessions for each shift, one week apart. Each training session shall be no less than four hours in duration (total of 8 hours training per shift for each piece of equipment).
 - b. The Contractor shall provide an additional four-hour refresher training session. The refresher training shall be provided three months after the respective equipment has been accepted.
4. The Consultant shall review and approve an outline of the content and adequacy of the training of Campus personnel for the equipment. The outline will be reviewed for content to ensure adequate coverage of the material. The Contractor will be required to revise the outline and training session based on comments by the Consultant. After approval of the training outline, submit draft PowerPoints (or equivalent) for the training. These project-specific PowerPoint presentations will integrate photos of as-built conditions, images of project specific diagrams and project specific visual cues for applicable systems. The Campus shall be responsible for providing the appropriate personnel at each session. Sessions once held may not be repeated, unless deficient or improperly taped, without additional cost to the Contractor. Contractor shall assign a person other than the training session instructor to operate the videotaping equipment. Tape of the first session shall be reviewed immediately with the Consultant to confirm that the taping method provides suitable, clear documentation of the training session, and shall become the sample against which all future tapes are judged. Tapes with substantial deficiencies, as compared to that sample, shall be redone in a repeated session of training. Tapes shall be copied for insertion into each manual, and shall be indexed and titled as to their contents with type written labels. The Campus personnel in attendance shall be documented with a sign in sheet for each session, to be included in the O & M Manuals. Attendance sign in shall constitute their certification that full training in the subjects was covered. Where training occurs off campus, provide confirmation vouchers showing attendance paid in full.
5. Refer to technical specification sections for additional training.

End of 01 00 00 General Requirements

CONTRACT MANUAL

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CAMPUS:

PROJECT TITLE:

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Agreed and Acknowledged:

By: _____

Date: _____

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Incorporated by Reference: Project Manual, Drawings and Specifications dated

State University Construction Fund AGREEMENT

This Agreement made as of the day of , 2020, by and between the State University Construction Fund, whose address is The State University Plaza, 353 Broadway, Albany, New York 12246, hereinafter referred to as the "Fund", and

hereinafter referred to as the "Contractor".

WITNESSETH:

The parties hereto agree that the Contractor shall (a) furnish and perform all work of every kind required and all other things necessary to complete in the most substantial and workmanlike manner the construction of

in strict accordance with the Contract Documents;

(b) complete all work necessary for substantial completion by «Completion» .

or within days, starting after receipt of the Notice to Proceed,

[[INSTRUCTIONS: Identify substantial completion date above utilizing only one method.]]

or within the time to which such completion may have been extended in accordance with the Contract Documents; (c) in the event it fails to substantially complete all the work on time, pay to the Fund liquidated damages in the amount of

for each calendar day of delay of substantially completing all the work; and (d) do everything required by the Contract; subject, however, to the terms, provisions and conditions listed hereinafter.

Article I General Provisions

Section 1.01 Definitions

Where the following words and expressions are used in the Contract Documents it is understood that they have the meaning set forth as follows:

Allowance Any and all work and materials which may be required of the Contractor in performing work set forth under one or more allowances to this Contract shall be Work, as defined herein, which shall be performed in accordance with the base schedule for the performance of the Contractor's Work. Contractor shall not be entitled to an extension of time for the performance of an allowance or all allowances.

Consultant The Architect or Engineer named in the Notice to Bidders or such other person or firm designated by the Fund to provide general administration of the Contract and inspection of the work.

Bidding Documents Notice to Bidders, Information for Bidders and Proposals

Bonds Performance Bond and Labor and Material Bond

Delay For purposes of this document and as used herein and in any other contract documents between the Contractor and the Fund the word "delay" shall be interpreted broadly and shall include by way of example only and not by way of limitation: delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the Fund and/or Consultant, and lack of coordination, cumulative impact of multiple change orders, delay and other impacts.

Contract or Contract The Agreement, Bonds, Specifications, Project Manual, Drawings, Addenda

Documents	issued prior to the opening of bids and Change Orders issued after award of the Contract.
Fund or Owner	State University Construction Fund
Notice of Award	Letter of Intent
Project	The facility or facilities to be constructed including all usual, appropriate and necessary attendant work shown on, described in or mentioned in the Contract.
Site	The area within the Contract limit lines, as shown on the Drawings, and all other areas upon which the Contractor is to perform work.
Substantial Completion	Substantial Completion is the completion of Work so that the Project can be fully occupied and used for the purposes for which it is intended. Substantial Completion includes: (1) completion of all work required for the issuance of a code compliance certificate, or a temporary approval for occupancy, completed in a manner that includes no uncorrected deficiency or material violation of the Building Code of New York State within the area or work for which the certificate is to be issued; (2) completion of all building systems and functional testing of said systems (other than tests that cannot be performed due to the seasonal environmental conditions in effect at the time of completion); (3) acceptance and approval of the Operating Instructions and Manuals and Training of Campus Personnel; and (4) the sum of values determined for Punch List work at the time of Substantial Completion shall not exceed one (1) percent of the amount of the Contract consideration unless otherwise agreed to by the Fund.
Work	The using, performing, installing, furnishing and supplying of all materials, equipment, labor, services and incidentals necessary or proper for or incidental to the successful completion of the Project and the carrying out of all

duties and obligations imposed upon the Contractor by the Contract.

Section 1.02 Captions

The titles or captions of Articles and Sections of the Contract are intended for convenience and reference purposes only and in no way define, limit or describe the scope or intent thereof or of the Contract or in any way affect the Contract.

Section 1.03 Nomenclature

Materials, equipment or other work described in words and abbreviations which have a well-known, technical or trade meaning shall be interpreted as having such meaning in connection with the Contract.

Section 1.04 Entire Agreement

The Contract constitutes the entire agreement between the parties hereto and no statement, promise, condition, understanding, inducement or representation, oral or written, expressed or implied, which is not contained herein shall be binding or valid and the Contract shall not be changed, modified, or altered in any manner except by an instrument in writing executed by the parties hereto.

Section 1.05 Successors and Assigns

The Contract shall bind the successors, assigns and representatives of the parties hereto.

Section 1.06 Accuracy and Completeness of Contract Documents

(1) The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all materials, plant, equipment, tools, skill and labor of every kind necessary for the proper execution of the work and also those things which may be reasonably inferable from the Contract Documents as being necessary to produce the intended results.

(2) The Contract Documents contemplate a finished piece of work of such character and quality as is reasonably inferable from them. The Contractor acknowledges that the Contract consideration includes sufficient money allowance to make its work complete and operational and in compliance with good practice and it agrees that inadvertent minor discrepancies or omissions or the failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another shall

not be the cause for additional charges or claims. In case of a conflict between any part or parts of the Contract Documents with any other part or parts thereof, as contrasted to an omission or failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another part thereof, the following shall be given preference, in the order hereinafter set forth, to determine what work the Contractor is required to perform: (a) Addenda (later dates to take preference over earlier dates); (b) Amendments to Agreement; (c) Agreement; (d) Specifications; (e) Schedules; (f) Large scale detail Drawings (detail drawings having a scale of 3/4" and over); (g) Large scale plan and section Drawings (plan and section drawings having a scale equal to or larger than that used for the basic floor or site plan, as the case may be); (h) Small scale detail Drawings (detail drawings having a scale of less than 3/4"); and (i) Small scale plan and section Drawings (plan and section drawings having a scale less than that used for the basic floor or site plan, as the case may be). In the event of such a conflict between or among parts of the Contract Documents that are entitled to equal preference, the more expensive way of doing the work, the better quality or greater quantity of material shall govern unless the Fund otherwise directs.

Section 1.07 Organization of Contract Documents

The Specifications and Drawings are generally divided into trade sections for the purpose of ready references, but such division is arbitrary and such sections shall not be construed as the prescription by the Consultant or the Fund of the limits of the work of any subcontractor or as a determination of the class of labor or trade necessary for the fabrication, erection, installation or finishing of the work required. The Contractor will be permitted to allot the work of subcontractors at its own discretion regardless of the grouping of the Specifications and Drawings. It shall be the Contractor's responsibility to settle definitively with each subcontractor the portions of the work which the latter will be required to do. The Fund and the Consultant assume no responsibility whatever for any jurisdiction claimed by any of the trades involved in the work.

Section 1.08 Furnishing of Contract Documents

The Fund shall establish the format for the Contract Documents (hard copy and/or electronic media) at the start of the Project. The Contractor shall be furnished, free of charge, with two (2) copies of the Specifications and Drawings in the selected format(s). Any other copies of the Specifications and Drawings which the

Contractor may desire can be obtained at the Contractor's expense.

Section 1.09 Examination of Contract Documents and Site

By executing the Contract, the Contractor agrees that it has carefully examined the Contract Documents together with the site of the proposed work as well as its surrounding territory; that it is fully informed regarding all the conditions affecting the work to be done and the labor and materials to be furnished for the completion of the Contract; and that its information has been acquired by personal investigation and research and not in the estimates and records of the Fund.

Section 1.10 Invalid Provisions

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

Section 1.11 No Collusion or Fraud

The Contractor hereby agrees that the Contract was secured without collusion or fraud and that neither any officer nor any employee of the Fund has or shall have a financial interest in the performance of the Contract or in the supplies, work or business to which it relates, or in any portion of the profits thereof.

Section 1.12 Notices

(1) All notices permitted or required hereunder shall be in writing and shall be transmitted either:

- a. via certified or registered United States mail, return receipt requested;
- b. by personal delivery;
- c. by expedited delivery service; or
- d. by email if actually received by the Fund.
Contractor bears the burden of service by email and receipt of email by the Fund.

Such notices shall be addressed as follows or to such different addresses as the parties may from time to time designate:

The State University Construction Fund

Name:

Title:

Address:

Telephone Number:

E-mail address:

Contractor

Company Name:

Designated Contact Name:

Contact Title:

Address:

Telephone Number:

E-mail Address:

(2) Any such notice shall be deemed to have been given either at the time of personal delivery or actual receipt by the Fund, or in the case of email, upon receipt by the Fund.

(3) The parties may, from time to time, specify any new or different address in the United States as their address for purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.

Section 1.13 Singular-Plural; Male-Female

As used in the Contract Documents, the singular of any word or designation, whenever necessary or appropriate, shall include the plural and vice versa, and the masculine gender shall include the female and neutral genders and vice versa.

Article II

Contract Administration and Conduct

Section 2.01 Consultant's Status

(1) The Consultant, as the Fund's representative, shall provide general administration of the Contract and inspection of the work. The Consultant will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and it will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents. The Consultant's duties, services and work shall in no way supersede or dilute the

Contractor's obligation to perform the work in conformance with all Contract requirements, but it is empowered by the Fund to act on its behalf with respect to the proper execution of the work and to give instructions and/or direction when necessary to require such corrective measures as may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the Fund's interest.

(2) The Consultant shall have the authority to stop the work or to require and/or direct the prompt execution thereof whenever such action may be necessary, in its professional opinion, to ensure the proper execution of the Contract or to otherwise protect the interests of the Fund.

(3) Except as otherwise provided in the Contract, the Consultant shall determine the amount, quality, acceptability, fitness and progress of the work covered by the Contract and shall decide all questions of fact which may arise in relation to the interpretation of the plans and Specifications, the performance of the work and the fulfillment by the Contractor of the provisions of the Contract. The Consultant shall in the first instance be the interpreter of the provisions of the Contract and the judge of its performance and it shall use its power under the Contract to enforce its faithful performance.

Section 2.02 Finality of Decisions

(1) Any decision or determination of the Consultant under the provisions of the Contract shall be final, conclusive and binding on the Contractor unless the Contractor shall, within ten (10) working days after such decision, make and deliver to the Fund a verified written statement of its contention that the decision of the Consultant is contrary to a provision of the Contract. The Fund shall thereupon determine the validity of the Contractor's contention. Pending decision by the Fund, the Contractor shall proceed in accordance with the Consultant's decision.

(2) Wherever it is provided in the Contract Documents that an application must be made to the Fund and/or determination made by the Fund, the Fund's decision on such application and/or its determination under the Contract Documents shall be final, conclusive and binding upon the Contractor unless the Contractor, within ten (10) working days after receiving notice of the Fund's decision or determination, files a written statement with the Fund and the Consultant that it reserves its rights in connection with the matters covered by said decision or determination and after a court of competent

jurisdiction determines the Fund's said decision or determination to be fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith, in an action brought in accordance with Section 4.24.

Section 2.03 Claims and Disputes

(1) If the Contractor claims (i) that any work it has been ordered to do is extra work or (ii) that it has performed or is going to perform extra work or (iii) that any action or omission of the Fund or the Consultant is contrary to the terms and provisions of the Contract, it shall:

- a. Promptly comply with such order;
- b. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the Fund and the Consultant, within five (5) working days after being ordered to perform the work claimed by it to be extra work or within five (5) working days after commencing performance of the extra work, whichever date shall be the earlier, or within five (5) working days after the said action or omission on the part of the Fund or the Consultant occurred, a written notice of the basis of its claim and request a determination thereof,
- c. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the Fund and the Consultant, within thirty (30) calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be the earlier, or said alleged action or omission by the Fund or the Consultant occurred, a verified detailed statement, with documentary evidence, of the items and basis of its claim, including an initial and updated detailed Time Progress Schedule,
- d. Produce for the Fund's examination, upon notice from the Fund, such information and documentation as directed by the Fund, which shall include but not be limited to job cost reports and all estimates and documentation used to develop the Bid Proposal, all its books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks and cancelled checks, showing all of its actions and transactions in connection with or relating to or arising by reason of its claim, and submit persons in its employment and in its subcontractors' employment for examination under oath by any

person designated by the Fund to investigate any claims made against the Fund under the Contract, such examination to be made at the offices of the Contractor; and

- e. Proceed diligently, pending and subsequent to the determination of the Fund with respect to any such disputed matter, with the performance of the Contract and in accordance with all instructions of the Fund and the Consultant.

(2) The Contractor's failure to comply with any or all parts of subdivision b, c and d of paragraph (1) of this Section shall be deemed to be: (i) a conclusive and binding determination on its part that said order, work, action or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and (ii) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission. The provisions of subdivision b, c and d of paragraph (1) of this Section are for the purpose of enabling the Fund to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects or circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expenses or circumstances as they occur. Compliance with such provisions is essential whether or not the Fund is aware of the circumstances of any order or other circumstances which might constitute a basis for a claim and whether or not the Fund has indicated it will consider a claim in connection therewith.

(3) The Contractor's failure to submit and maintain a Time Progress Schedule in accordance with Section 3.02 of the Agreement shall be deemed to be a waiver by the Contractor of all claims for additional time, compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work. The Schedule of Record, regularly updated and submitted at required durations in accordance with the provisions of the General Requirements, Section paragraph titled "Project Schedule": (i) informs the Fund and affords it promptly of regular opportunities to change its plans or mitigate or remedy the effects or circumstances giving rise to a claim of delay in the completion of the work or take such other action as may seem desirable to verify any claimed circumstances as they occur; and (ii) forms a record which becomes the basis of the Fund's verification of an alleged cause of delay in the completion of the work.

(4) No person has power to waive or modify any of the foregoing provisions and, in any action against the Fund to recover any sum in excess of the sum certified by the Fund to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with the provisions of this Section.

(5) Nothing in this Section shall in any way affect the Fund's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by or against the Fund or the Contractor.

Section 2.04 Omitted Work

The Fund reserves the right at any time during the progress of the work to delete, modify or change the work covered by the Contract, by a Change Order or Field Order thereto providing for either a reduction or omission of any portion of the work, without constituting grounds for any claim by the Contractor for allowances for damages or for loss of anticipated profits and in such event a deduction shall be made from the Contract consideration, the amount of which is to be determined in accordance with the provisions of Section 4.02 or 4.05A of the Agreement.

Section 2.05 Extra Work

(1) The Fund reserves the right at any time during the progress of the work to add, modify or change the work covered by the Contract by Change Order or Field Order or as otherwise required by the Fund thereto providing for extra work of either a qualitative or quantitative nature and in such event the Contract consideration may be increased by an amount to be determined in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement and the completion date for all or any part of the work may be extended for such period of time as may be determined by the Fund as necessary, because of the extra work, to complete the work or any part thereof.

(2) Nothing in the Contract Documents shall excuse the Contractor from proceeding with the extra work as directed. The terms and conditions of the Contract Documents shall be fully applicable to all extra work.

(3) The Contractor shall have no claim for extra work or an extension of time if the performance of such work, in the judgment of the Consultant, is made necessary or desirable because of any act or omission of the Contractor which is not in accordance with the Contract.

(4) Notwithstanding the provisions of Section 2.02 of the Agreement and any other provisions of the Contract Documents to the contrary, an officer of the Fund, after conferring with the Consultant, shall have the right to overrule a determination or decision of the Consultant, that relates to whether certain work is included in the Contract Documents or is extra work, which he or she believes is incorrect; in the event an officer exercises such right, his or her determination or decision shall be final, conclusive and binding upon the Contractor and the Fund unless the same shall be determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith.

Section 2.06 Contractor to Give Personal Attention

(1) The Contractor shall give its constant personal attention to all the work while it is in progress and shall place the work in charge of a competent and reliable full-time superintendent acceptable to the Consultant and the Fund who shall have authority to act for the Contractor and who shall be accountable to the Consultant to the extent provided in the Contract. Unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ, such superintendent shall not be changed without the written permission of the Consultant and the Fund.

(2) When the Contractor and its superintendent are temporarily absent from the site of the work, the Contractor or its superintendent shall designate a responsible supervisory employee, approved by the Consultant and the Fund, to receive such orders as the Consultant or its representative may give. At no time shall any work be conducted on the site in the absence of an individual present who has been so designated by the Contractor or its superintendent as having authority to receive and execute instructions given by the Consultant or its representative.

(3) If the superintendent, project manager or other supervisory employees are not satisfactory to the Fund, the Contractor shall, if directed by the Fund, immediately replace such supervisory employees with other supervisory employees acceptable to the Consultant and the Fund. Such replacement and all related impacts shall be at no additional cost to the Fund.

(4) In addition to the superintendent required by 2.06(1) and (2), provide a full-time Project Manager who has ten (10) years' experience as a Project Manager with experience on three (3) other projects of similar size and scope. "Full-time" in the previous

sentence is defined as being on the site of the work at any time work is being performed unless an absence is approved by the Consultant and the Fund. The Project Manager shall provide constant personal attention in managing the prosecution of all the work while it is in progress and shall respond to concerns expressed by the Consultant and the Fund in a responsible and reliable manner. The Project Manager shall not be obligated to perform any other work that is likely to impair his/her attention to the prosecution and completion of the work of this Contract. The Project Manager shall be acceptable to the Consultant and the Fund and shall not be replaced without written permission of the Consultant and the Fund unless the Project Manager proves to be unsatisfactory to the Contractor or ceases to be in its employ. The value of the Project Manager in the Contract Breakdown required in Section 4.08 of Article IV shall be fixed at \$10,000 for each month, or portion thereof, prior to the substantial completion date specified on page A-1 of the Agreement.

Section 2.07 Employment of Workers

The Contractor shall at all times employ competent and suitable workers and equipment which shall be sufficient to prosecute all the work to full completion in a disciplined orderly manner and in accordance with the Time Progress Schedule and the contractually required time of performance. All workers engaged in special or skilled work shall have had sufficient experience in such work to properly and satisfactorily perform the same. Should the Consultant deem any employee of the Contractor or any subcontractor incompetent, careless, insubordinate or otherwise objectionable or whose continued employment on the work is deemed by the Consultant to be contrary to the public interest, it shall so advise the Contractor and the latter shall dismiss or shall cause the subcontractor, if such employee is employed by the latter, to dismiss such employee and such employee shall not again be employed on the work to be performed under the Contract without obtaining the prior written approval of the Consultant.

Section 2.08 Detailed Drawings and Instructions

Upon timely notice from the Contractor that supplementary information is required, the Consultant shall furnish additional instructions, by means of Drawings or otherwise, necessary for the proper execution of the work. All such Drawings and instructions shall be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. The work shall be

executed in conformity therewith and the Contractor shall do no work without proper Drawings and/or instructions.

Section 2.09 Contract Documents to Be Kept at Site

The Contractor shall keep at the site of the work a copy of the Drawings and Specifications and shall at all times give the Consultant and the Fund access thereto.

Section 2.10 Permits and Building Codes

The Contractor shall obtain from the proper authorities all permits legally required to carry on its work, pay any and all taxes and fees legally required and shall be responsible for conducting its operations in accordance with the provisions of such permits. Except as otherwise expressly provided in the Contract Documents, all of the work covered by this Contract which is to be performed on property owned by the State University of New York is not subject to the building code of any city, county or other political subdivision of the State of New York. It is, however, subject to the provisions of the Building Code of New York State and the applicable Federal and State health and labor laws and regulations.

Section 2.11 Surveys

(1) From the data shown on the Drawings and identified at the site by the Consultant, a licensed surveyor, to be designated and paid for by the Fund, shall establish one (1) fixed benchmark and one (1) fixed base line at the site. The Contractor shall work from the benchmarks and base lines shown on the Drawings, identified at the site by the Consultant and established at the site by the aforesaid surveyor and shall establish such supplementary bench marks and base lines that are required in order for it to lay out the work. The Contractor shall be responsible for all measurements that may be required for execution of the work to the exact position and elevation as prescribed in the Specifications, shown on the Drawings, or as the same may be modified at the direction of the Consultant to meet changed conditions or as a result of modifications to the work covered by the Contract.

(2) The Contractor shall furnish at its own expense such stakes and other required equipment, tools and materials, and all labor as may be required in laying out any part of the work. If, for any reason, monuments are disturbed, it shall be the responsibility of the Contractor to reestablish them, without cost to

the Fund, as directed by the Consultant. The Consultant may require that construction work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking completed work or the work in progress.

(3) In all multiple-story construction, the Contractor shall establish and maintain line marks at each floor level and grade marks four (4) feet above the finished floor at each floor level.

Section 2.12 Site Conditions

(1) The Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provision as it deems proper for all physical conditions and subsurface conditions as it could reasonably anticipate encountering from the provisions of the Contract Documents, borings, rock cores, topographical maps and such other information as the Fund or the Consultant made available to it prior to the Fund's receipt of bids or from its own inspection and examination of the site prior to the Fund's receipt of bids.

(2) In the event that the Contractor encounters subsurface physical conditions or other latent physical conditions at the site differing substantially from those shown on or described or indicated in the Contract Documents and which could not have been reasonably anticipated from the aforesaid information made available by the Fund or the Consultant or from the Contractor's aforesaid inspection and examination of the site, it shall give immediate notice to the Consultant of such conditions before they are disturbed. The Consultant will thereupon promptly investigate the conditions and, if it finds that they do substantially differ from that which should have been reasonably anticipated by the Contractor, it shall make such changes in the Drawings and Specifications as may be necessary and a Change Order or Field Order may be issued, the amount of which shall be determined in accordance with the provisions of Sections 4.02 and 4.05A, to reflect any increase or decrease in the cost of, or the time required for, performance of the Contract as a result of any of the aforesaid changes made by the Consultant and/or as a result of such unanticipated subsurface conditions.

Section 2.13 Right to Change Location

When additional information regarding the subsurface conditions becomes available to the Fund as a result of the excavation work, further testing or otherwise, it may be found desirable to change the location,

alignment, dimensions or grades to conform to such conditions. The Fund reserves the right to make such reasonable changes in the work as, in its opinion, may be considered necessary or desirable; such changes and any adjustments in the Contract consideration as a result thereof are to be made in accordance with the provisions of Sections 2.04, 2.05 4.02 and 4.05A of the Agreement.

Section 2.14 Unforeseen Difficulties

Except as otherwise expressly provided in Section 2.12 of the Agreement and in other Sections of the Contract Documents, the Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provisions as it deems proper for any unforeseeable obstacles or difficulties which it may encounter in the performance of the work.

Section 2.15 Moving Materials and Equipment

Should it become necessary, in the judgment of the Consultant, at any time during the course of the work to move materials which are stored on the site and equipment which has been temporarily placed thereon, the Contractor upon request of the Consultant shall move them or cause them to be moved at its sole cost and expense; provided, however, if materials and equipment that have been stored or placed by the Contractor at a location on the site expressly approved, in writing, by the Consultant and the same are moved or caused to be moved by the Contractor at the Consultant's request, such removal shall be deemed extra work and the Contractor shall be compensated therefor in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement.

Section 2.16 Other Contracts

(1) Prior to and during the progress of the work hereunder the Fund reserves the right to let or permit the letting of other contracts relating to the Project or in connection with work on sites within the Contract limit lines or adjoining or adjacent to that on which the work covered by this Contract is to be performed. In the event such other contracts are let, or have previously been let, the Contractor and such other contractors shall coordinate their work with each other, arrange the sequence of their work to conform with the progressive operation of all the work covered by such contracts and afford each other reasonable opportunities for the introduction and storage of their materials, supplies and equipment and the execution of their work. If the Contractor or such other contractors contend that their work or the progress

thereof is being interfered with by the acts or omissions of the other or others or that there is a failure to coordinate or properly arrange the sequence of the work on the part of the Contractor or such other contractors, they shall, within five (5) working days of the commencement of such interference or failure of coordination or failure to perform work in proper sequence, give written notification to the Fund and the Consultant of such contention. Upon receipt of such notification or on its own initiative, the Consultant shall investigate the situation and issue such instructions to the Contractor or such other contractors with respect thereto as it may deem proper. The Consultant shall determine the rights of the Contractor and of such other contractors and the sequence of work necessary to expedite the completion of all work covered by this Contract in relation to the work covered by said other contracts.

(2) The Contractor agrees that it has and will make no claim for damages against the Fund by reason of any act or omission to act by any other contractor or in connection with the Consultant's or Fund's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to recover such damages from the other contractors.

(3) Not Used.

(4) If the proper and accurate performance of the work covered by the Contract depends upon the proper performance and execution of work not included herein or depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Consultant any defects in such work that render it unsuitable for proper execution and results. Its failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work covered by the Contract, except as to latent defects which may be discovered thereafter.

Section 2.17 Inspection and Testing

(1) All materials and workmanship shall be subject to inspection, examination and testing by the Consultant and the Fund at all times during the performance of the work and at all places where the work is carried on. Except as otherwise herein specified, the Fund shall pay for the cost of inspection, examination and testing by the Consultant or the Fund. If, however, the tests prove that the materials and/or work tested do not meet the requirements of the Contract, then the entire cost of such tests and any additional testing and or inspections required until the work is deemed compliant is to be borne by the

Contractor. The Consultant will have the right to reject defective material and workmanship furnished by the Contractor or require its correction. The Contractor, without charge therefor, shall satisfactorily and promptly correct all rejected work and replace all rejected material with proper material.

(2) The Contractor shall promptly segregate and remove from the site of the work all rejected material and work. If the Contractor shall fail to proceed at once with the replacing of rejected material and/or correction of defective workmanship, the Fund may, by contract or otherwise, replace such material and/or correct such workmanship, and charge the costs thereof to the Contractor or it may cancel the Contract and terminate the Contractor's employment as provided in the Agreement.

(3) The Contractor, without additional charge, shall promptly furnish all reasonable facilities, labor materials and equipment with associated operators necessary for the safe and convenient access, inspection and testing that may be required by the Consultant or the Fund.

(4) If the Contract Documents or the Consultant's instructions or the applicable laws, ordinances or regulations of any governmental authority require any part of the work covered by the Contract to be specially tested or inspected, the Contractor shall give the Consultant timely notice of its readiness for such testing or inspection or, if the same is to be performed by a governmental authority, of the date fixed therefor. If any such work, without the written permission of the Consultant, should be covered up prior to such testing or inspection, the Contractor, at its sole cost and expense must, if directed by the Consultant, uncover the same for testing or inspection and reconstruct same after the tests or inspection are conducted. All certificates of inspection or testing, involving the Contractor's work, required to be obtained from governmental authorities are to be secured by the Contractor at its sole cost and expense.

(5) Should it be considered necessary or advisable by the Consultant at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out same, the Contractor, upon request, shall furnish all necessary facilities, labor and material to perform such examination. If the work subject to such examination is found to be defective or nonconforming in any manner due to the fault of the Contractor or any of its subcontractors, such uncovering or destruction and necessary reconstruction, even though such includes work not covered in the Contract, shall be at the

expense of the Contractor. If, however, such work after testing and examination is found to be satisfactory, the Fund will pay the Contractor the cost of such uncovering or destruction and reconstruction, such cost to be determined as in the case of extra work as provided in Sections 4.02 and 4.05A.

(6) Inspection of material and furnished articles to be incorporated in the work may be made at the place of production, manufacture or shipment unless otherwise stated herein. The inspection of material and workmanship for final acceptance as a whole or in part will be made at the site of the work.

Section 2.18 Subcontractors

(1) Except for subcontractors designated by the Fund, or required to be named at any earlier date, pursuant to the provisions of the Information for Bidders, within thirty (30) calendar days after receipt of the Notice to Proceed, the Contractor must submit a written statement to the Consultant giving the name and address of all proposed subcontractors. Said statement must contain a description of the portion of the work and materials which the proposed subcontractors are to perform and furnish and any other information tending to prove that the proposed subcontractors have the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and provisions of the Contract Documents.

(2) If the Consultant finds that the proposed subcontractors are qualified, it will so notify the Contractor within ten (10) working days after receipt of the aforesaid information. If the determination is to the contrary, however, the Consultant within such period will notify the Contractor of such determination and the latter, unless it decides to do such work itself and is qualified, in the Consultant's opinion, to do such work, must, within ten (10) working days thereafter, submit similar information with respect to other proposed subcontractors.

(3) The Consultant's approval of a subcontractor and/or the Fund's designation of a subcontractor pursuant to the provisions of the Contract Documents shall not relieve the Contractor of any of its responsibilities, duties and liabilities hereunder. The Contractor shall be solely responsible to the Fund for the acts or defaults of such subcontractors and of such subcontractors' officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

(4) The Contractor shall be fully responsible for the administration, integration, coordination, direction and supervision of all of its subcontractors and of all work and it shall check all space requirements of the work and coordinate and adjust the same so that conflicts in space do not occur in the work being performed by it with its own employees and with the work being performed by its subcontractors and so that all equipment, piping, wiring, etc., can be installed, where possible, in the spaces allowed for same.

(5) No subcontractor shall be permitted to work at the site until: (a) it has furnished satisfactory evidence to the Consultant of the insurance required by law; (b) in the case of a Project involving a federal grant, it has furnished satisfactory evidence to the Consultant of the same type and amount of liability insurance as that required of the Contractor by Section 5.06 of the Agreement; and (c) except for subcontractors designated by the Fund pursuant to the provisions of the Information for Bidders, it has been approved by the Consultant.

(6) Within ten (10) working days after the Contractor receives payment from the Fund on account of a progress payment application for the percentage of the work done, it shall pay each of its subcontractors the sum contained in said payment for the percentage of said subcontractor's work, less the same amount retained therefrom by the Fund under the terms of the Contract Documents or in consequence of any legal proceedings or statutory liens, and less any amounts due the Contractor under the subcontract for work not performed or not properly or timely performed by the subcontractor. In the event any subcontractor is not paid by the Contractor, the former should immediately notify the Fund of such fact.

(7) The Contractor shall execute with each of its subcontractors and shall require all subcontractors to execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Contract insofar as such terms and provisions are applicable to the work to be performed by such subcontractors. The Contractor shall require all subcontractors and sub-subcontractors to promptly, upon request, file with the Consultant and the Fund a conformed copy of such agreements, from which the price and terms of payment may be deleted.

(8) If for sufficient reason, at any time during the progress of the work to be performed hereunder, the Consultant determines that any subcontractor or sub-subcontractor is incompetent, careless, or uncooperative, the Consultant will notify the Contractor accordingly and immediate steps will be

taken by the Contractor for cancellation of such subcontract or sub-subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor or sub-subcontractor for loss of prospective profits on work unperformed and/or work unfurnished and a provision to that effect shall be contained in all subcontracts and sub-subcontracts.

(9) No provisions of this Contract shall create or be construed as creating any contractual relation between the Fund and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

Section 2.19 Shop Drawings and Samples

(1) The Contractor in accordance with the approved Shop Drawing, Submittal, Mockup, and Sample schedules and with such promptness and in such sequence as to cause no delay in the work, shall submit for the Consultant's approval all Shop Drawings and Samples called for under the Contract or requested by the Consultant.

(2) Shop Drawings and mock-ups shall establish the actual detail of the work, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings include drawings, diagrams, schedules, product data and other information or materials specially prepared for the work by the Contractor to illustrate some portion of the work. Product data include standard illustrations, schedules, performance charts, instructions, brochures, diagrams and other information identified by the Contractor to illustrate materials or equipment for some portion of the work.

(3) All Shop Drawings, mock-ups and samples shall be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Consultant for approval and all Shop Drawings shall bear the Contractor's recommendation for approval. Any Shop Drawings submitted without this stamp of approval and certification, and Shop Drawings which, in the Consultant's opinion, are incomplete, contain numerous errors or have not been checked or only checked superficially, will be returned unchecked by the Consultant for resubmission by the Contractor. In checking Shop Drawings, the Contractor shall verify all dimensions and field conditions and shall check and

coordinate the Shop Drawings of any section or trade with the requirements of all other sections or trades whose work is related thereto, as required for proper and complete installation and sequence of the work.

(4) Samples must be of sufficient size or number to show the quality, type, range of color, finish and texture of the material. Each Sample shall be properly labeled to show the nature of the material, trade name of manufacturer, name and location of the work where the material represented by the Sample is to be used and the name of the Contractor submitting the Sample. Transportation charges to the Consultant must be prepaid on Samples forwarded to it.

(5) At the start of the Project, the format for submittals shall be established by the Fund. If an electronic method is selected for the submission and approval of submittals, the Contractor shall provide submittals in a PDF format and the Consultant will return the submittals in electronic format to the Contractor. For both hard-copy and electronic submittal formats, all submittals that require physical samples or mock-ups shall be provided in accordance with the requirements set forth in the Contract Specifications. Shop Drawings and Samples, submitted by the Contractor in accordance with the approved Shop Drawing and Sample schedule that is included in the Time Progress Schedule, will be reviewed by the Consultant within fifteen (15) working days and if satisfactory will be approved. A Shop Drawing, when approved, will be returned to the Contractor. If not satisfactory, the Drawings and Samples will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall resubmit to the Consultant a corrected copy of the Shop Drawing or a new Sample, as the case may be. The Contractor shall make any correction required by the Consultant and shall appropriately note any changes or revisions on the Shop Drawing, dated to correspond with the date of the Consultant's request for the change. Upon approval of the Shop Drawing by the Consultant, the Contractor shall promptly furnish to the Consultant as many copies thereof as the Consultant may reasonably request. Should more than two (2) separate reviews of any required shop drawings or samples submitted be necessary, in the judgement of the Consultant and the Fund, the Contractor shall be responsible for the reasonable costs incurred by the Fund for such additional reviews by the Consultant.

(6) At the time of submission of a Shop Drawing or Sample, the Contractor shall inform the Consultant and the Fund in writing of any deviation in the Shop Drawing or Sample from the requirements of the

Contract Documents. Unless such deviation is specifically noted by the Contractor with a notation that such deviation will result in extra work for which the Contractor requests payment, the Contractor shall be deemed to have waived any claim for extra work, additional compensation or payment or an extension of time with respect to all work shown on, described in or related to the Shop Drawing or Sample.

(7) The Consultant's approval of Shop Drawings or Samples is for design only and is not a complete check on the method of assembly, erection or construction. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, except where the Contractor, in accordance with the provisions of paragraph 6 of this Section, has previously notified the Fund and the Consultant of such departure; (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, omissions or otherwise that may exist; (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength; (d) relieving the Contractor of full responsibility for satisfactory performance of all work and coordination with the work of all subcontractors and other contractors; or (e) permitting departure from additional details or instructions previously furnished by the Consultant.

(8) No work requiring a Shop Drawing or Sample shall be commenced until a Shop Drawing or Sample is approved by the Consultant and all such work shall be: (a) in accordance with the approved Shop Drawing, provided the latter conforms in all respects to the Contract Documents or to such deviations therefrom as have been previously noted by the Contractor in accordance with the provisions of paragraph 6 of this Section; and (b) in conformance in all respects to the sample furnished to and approved by the Consultant and, unless otherwise specified, as new and of good quality.

(9) The Contractor may be required to provide professional services that constitute the practice of architecture or engineering when specifically required by the Contract Documents for a portion of the work or the Contractor needs to provide such services in order to carry out its responsibilities for construction means, methods, techniques, sequences and procedures. When professional services are required in the Contract Documents, the Consultant will specify all performance and design criteria that such services must satisfy. The Fund and Consultant shall be entitled to rely on the adequacy, accuracy and completeness of the professional services,

certifications, and approvals performed or provided by design professionals working for the Contractor.

(10) Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% in the review or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.19.

Section 2.20 Equivalents - Approved Equal

(1) Equivalents or Approvals - General

a. The words "similar and equal to", or equal", "equivalent" and such other words of similar content and meaning shall for the purposes of this Contract be deemed to mean similar and equivalent to one of the named products. For the purposes of subdivisions (1) and (2) of this Section and for the purposes of the Bidding Documents, the word "products" shall be deemed to include the words "articles", "materials", "items", "equipment" and "methods". Whenever in the Contract Documents one or more products are specified, the words "similar and equal to" shall be deemed inserted.

b. Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent is not to limit competition, but to establish a standard of quality which the Consultant has determined is necessary for the Project. A Contractor may at its option use any product other than that specified in the Contract Documents provided the same is approved by the Consultant in accordance with the procedures set forth in subdivision (2) of this Section. In all cases the Consultant shall be the sole judge as to whether a proposed product is to be approved and the Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Consultant, that the proposed product is similar and equal to the named product. In making such determination the Consultant may establish such objective and appearance criteria as it may deem proper that the proposed product must meet in order for it to be approved.

c. Nothing in the Contract Documents shall be construed as representing, expressly or implied, that the named product is available or that there is

or there is not a product similar and equal to any of the named products and the Contractor shall have and make no claim by reason of the availability or lack of availability of the named product or of a product similar and equal to any named product.

- d. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Consultant in considering a product proposed by the Contractor or by reason of the failure of the Consultant to approve a product proposed by the Contractor.
- e. Requests for approval of proposed equivalents will be received by the Consultant only from the Contractor.
- f. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, sequence of work, omissions or otherwise that may exist, (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength, (d) relieving the Contractor of full responsibility for satisfactory performance of all work to achieve a functionally complete facility or result and coordination with the work of all subcontractors and other contractors or (e) permitting departure from additional details or instructions previously furnished by the Consultant.
- g. Contractor agrees that the Contractor approves and authorizes the deduction from Contractor's applications for payment any and all costs incurred by the Construction Manager, Consultant, Design Professional or otherwise in evaluating Contractor's submissions under this Section 2.20, together with a markup upon such hard costs in the amount of 15%.

(2) Equivalents or Approvals After Bidding

- a. Any and all submissions for "or equal" products which are submitted by the Contractor after award of the Contract must be made by the Contractor within ninety (90) calendar days after the date of award. Contractor agrees that it waives and relinquishes the right, claim or privilege, if any, to submit "or equal" proposals if such are made ninety (90) calendar days after the date of award of the Contract to the

Contractor.

- b. Requests for approval of proposed equivalents will be considered by the Consultant after bidding only in the following cases: (a) the named product cannot be obtained by the Contractor because of strikes, lockouts, bankruptcies or discontinuance of manufacture and the Contractor makes a written request to the Consultant for consideration of the proposed equivalent within ten (10) calendar days of the date it ascertains it cannot obtain the named product; or (b) the proposed equivalent is superior, in the opinion of the Consultant, to the named product; or (c) the proposed equivalent, in the opinion of the Consultant, is equal to the named product and its use is to the advantage of the Fund, e.g., the Fund receives an equitable credit, acceptable to it, as a result of the estimated cost savings to the Contractor from the use of the proposed equivalent or the Fund determines that the Contractor has not failed to act diligently in placing the necessary purchase orders and a savings in the time required for the completion of the construction of the Project should result from the use of the proposed equivalent.
 - c. Where the Consultant pursuant to the provisions of this subdivision approves a product proposed by a Contractor and such proposed product requires a revision or redesign of any part of the work covered by this Contract, all such revision and redesign and all new Drawings and details required therefor shall be subject to the approval of the Consultant and shall be provided by the Contractor at its own cost and expense.
 - d. Where the Consultant pursuant to the provisions of this Section approves a product proposed by a Contractor and such proposed product requires a different quantity and/or arrangement of duct work, piping, wiring, conduit or any other part of the work from that specified, detailed or indicated in the Contract Documents, the Contractor shall provide the same at its own cost and expense.
- (3) Contractor agrees that the Fund may deduct from any application for payment made by the Contractor any and all Design Professional,

Consultant and/or Construction Management fees and costs incurred by the Fund, together with a markup upon such hard costs in the amount of 15%, in the consideration or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.20.

Section 2.21 Patents, Trademarks and Copyrights

The Contractor acknowledges that the Contract consideration includes all royalties, license fees and costs arising from patents or trademarks in any way involved in the work; provided, however, that the Contract consideration shall not be deemed to have included therein any royalty, license fee or cost arising from a patent or trademark for a design prepared by the Consultant and the Contractor shall have no liability in connection therewith. Where the Contractor is required or desires to use any product, device, material or process covered by patent or trademark, the Contractor shall indemnify and save harmless the Fund from any and all claims, actions, causes of action or demands, for infringement by reason of the use of such patented product, device, material or process, and shall indemnify the Fund from any cost, liability, damage and expense, including reasonable attorneys' fees and court costs, which it may be obligated to incur or pay by reason of any claim or infringement at any time both before or after the Fund's final acceptance of all the work to be performed under the Contract.

Section 2.22 Possession Prior to Completion

If before the final completion of all the work it shall be deemed advisable or necessary by the Fund to take over, use, occupy or operate any part of the completed or partly completed work or to place or install therein equipment and furnishings, the Fund, upon reasonable written notice to the Contractor, shall have the right to so do and the Contractor will not in any way interfere therewith or object to the same. Such action by the Fund shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract Documents and the Contractor acknowledges that such action by the Fund does not in any way evidence the completion of the work or any part thereof or in any way signify the Fund's acceptance of the work or any part thereof. The Contractor agrees to continue the performance of all work covered by the Contract in a manner which will not unreasonably interfere with such takeover, use, occupancy, operation, placement or installation.

Section 2.23 Completion and Acceptance

(1) Partial Completion

If before the final completion of all the work any portion of the permanent construction has been satisfactorily completed and the same will be immediately useful to the Fund, the latter may, by written notice, advise the Contractor that it accepts such portion of the work. Such action by the Fund shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any work not so completed and accepted. The partial completion of any portion of the Contractor's work by the Fund, the Campus or the Consultant, shall not impact the assessment of liquidated damages or actual costs for delays or disruption to the Project caused by the Contractor, its subcontractors or vendors.

(2) Substantial Completion

When all the Work covered by the Contract is substantially completed, as defined in Section 1.01, the Contractor shall give written notice thereof to the Fund and the Consultant. The latter will then promptly make an inspection of the work and, if they shall determine that all the work is substantially completed, they shall so advise the Contractor. Such action shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any uncompleted (including untested or deferred work), unaccepted or corrective work or in any way affect, limit or preclude the issuance by the Consultant, from time to time thereafter, of "Punch Lists", i.e., lists of uncompleted or corrective work which the Contractor is to promptly complete and/or correct. In the judgement of the Fund, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

The Contractor must fully, completely and acceptably perform all Punch List work and any other work subsequently discovered remaining to be completed or corrected, within ninety (90) calendar days of Substantial Completion or within such other timeframe stipulated by the Fund or Consultant. Failure to complete the Punch List within the time so designated hereunder may be deemed default on the part of the Contractor.

(3) Final Completion and Acceptance

After the completion of all the work the Contractor shall give written notice to the Fund and the Consultant that all the work is ready for inspection and final acceptance. The Fund and the Consultant shall promptly make such inspection and, if they shall determine that all the work has been satisfactorily completed, the Fund shall thereupon by written notice advise the Contractor that it accepts such work. In the judgement of the Fund, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

Section 2.24 Record Drawings

(1) At the start of the Project, the format for Record Drawings shall be established by the Fund. Prior to acceptance by the Fund of all work covered by the Contract, the Contractor shall furnish to the Consultant one (1) set of current Contract Drawings on which the Contractor has recorded, using colored pencil for hard copy format or electronic editing tool in contrasting color for electronic format, in a neat and workmanlike manner, all instances where actual field construction differs from work as indicated on the Contract Drawings. These "Record". Drawings shall show the following information: (a) all significant changes in plans, sections, elevations and details, such as shifts in location of walls, doors, windows, stairs and the like made during construction; (b) all significant changes in foundations, columns, beams, openings, concrete reinforcing, lintels, concealed anchorages and "knock-out" panels made during construction; (c) final location of electric panels, final arrangement of electric circuits and any significant changes made in electrical design as a result of Change Orders, Field Orders or job conditions; (d) final location and arrangement of all mechanical equipment and major concealed plumbing, including, but not limited to, supply and circulating mains, vent stacks, sanitary and storm water drainage; (e) final location and arrangement of all underground utilities, connections to building and/or rerouting of existing utilities, including, but not limited to, sanitary, storm, heating, electric, signal, gas, water and telephone; and (f) final make and model for all significant equipment and devices listed in the specifications. The Contractor shall also provide an electronic version as determined by the Consultant.

(2) Periodically during the work, the Consultant may request submission of a progress set of Record Drawings for review and advise the Contractor of errors or omissions, if any, that must be corrected or completed prior to final submission of the Record Drawings. Shop Drawings shall not be acceptable as Record Drawings.

(3) The Contractor shall submit the Record Drawings to the Consultant at least fifteen (15) days prior to the date of Substantial Completion. The Consultant will then review the Record Drawings and, if they shall determine that the Record Drawings represent the actual field construction being completed, they shall so advise the Contractor. If not satisfactory, the Record Drawings will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall promptly correct and resubmit to the Consultant a corrected copy of the Record Drawings. Acceptance of the Record Drawings by the Fund is a condition precedent to the Contractor's entitlement to receive Final Payment.

Section 2.25 Guarantees

(1) The Contractor, at the convenience of the Fund, shall remove, replace and/or repair at its own cost and expense any defects in workmanship, materials, ratings, capacities or characteristics occurring in or to the work covered by the Contract within one (1) year or within such longer period as may otherwise be provided in the Contract, the period of such guarantee to commence with the Fund's final acceptance of all work covered under the Contract or at such other date or dates as the Fund may specify prior to that time, and the Contractor, upon demand, shall pay for all damage to all other work resulting from such defects and all expenses necessary to remove, replace and/or repair such other work which may be damaged in removing, replacing or repairing the said defects. The obligations of the Contractor under the provisions of this paragraph or any other guarantee provisions of the Contract Documents are not limited to the monies retained by the Fund under the Contract.

(2) Unless such removal, replacement and/or repair shall be performed by the Contractor within ten (10) working days after it receives written notice from the Fund specifying such defect, or if such defect is of such a nature that it cannot be completely removed, repaired and/or replaced within said ten (10) day period and the Contractor shall not have diligently commenced removing, repairing and/or replacing such defect within said ten (10) day period and shall not thereafter with reasonable diligence and in good

faith proceed to do such work, the Fund may employ such other person, firm or corporation as it may choose to perform such removal, replacement and/or repair and the Contractor agrees, upon demand, to pay to the Fund all amounts which it expends for such work.

Section 2.26 Default of Contractor

(1) In addition to those instances specifically referred to in other Sections hereof, the Fund shall have the right to declare the Contractor in default of the whole or any part of the work if:

- a. The Contractor becomes insolvent; or if
- b. The Contractor makes an assignment for the benefit of creditors pursuant to the statutes of the State of New York; or if
- c. A voluntary or involuntary petition in bankruptcy is filed by or against the Contractor; or if
- d. A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if
- e. The Contractor fails to commence work when notified to do so by the Consultant; or if
- f. The Contractor shall abandon the work; or if
- g. The Contractor shall refuse to proceed with the Work or extra Work when and as directed by the Consultant or Fund; or if
- h. The Contractor shall without just cause reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the Fund, to complete the work in accordance with the approved time progress schedule, and shall fail or refuse to sufficiently increase such working force when ordered to do so by the Consultant; or if
- i. The Contractor shall sublet, assign, transfer convey, or otherwise dispose of the Contract other than as herein specified; or if
- j. The Fund shall be of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if
- k. The Fund shall be of the opinion that the work cannot be completed within the time herein

provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the Fund's opinion, attributable to conditions within the Contractor's control; or if

- l. The work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if
- m. The Fund shall be of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Contract;
- n. The Fund shall be of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms; or if
- o. At any time during the period of the Agreement, insurance as required is not in effect or proof thereof is not provided to the Fund.

(2) Before the Fund shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items *a, b, c, d, e, f, g, h, j, k, l, m, n* and *o*, it shall give the Contractor three (3) working days' notice of its intention to declare the Contractor in default and unless, within such three (3) day period, the Contractor shall make arrangements, satisfactory to the Fund, to correct and/or eliminate the conditions set forth in the Fund's aforesaid notice, the Contractor may be declared in default at the expiration of such three (3) day period or at the expiration of such longer period of time as the Fund may determine.

(3) The right to declare in default for any of the grounds specified or referred to shall be exercised by the Fund sending the Contractor a written notice setting forth the ground or grounds upon which such default is declared. Upon receipt of notice that it has been declared in default, the Contractor shall immediately discontinue all further operations under the Contract and shall immediately quit the site, leaving untouched all plant, materials, equipment, tools and supplies then on site.

(4) The Fund, after declaring the Contractor in default, may then have the work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or it may call

upon the Contractor's surety at its own expense to do so.

(5) In the event that the Fund declared the Contractor in default of the work or any part of the work, the Contractor, in addition to any other liability to the Fund hereunder or otherwise provided for or allowed by law, shall be liable to the Fund for any costs it incurs for additional architectural and engineering services necessary, in its opinion, because of the default and the total amount of liquidated damages from the date when the work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the work, both of which items shall be considered as expenses incurred by the Fund in completing the work and the amount of which may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the work had been completed without a default.

(6) If the Fund completes the work, the Consultant shall issue a certificate stating the expenses incurred in such completion, including the cost of re-letting. Such certificate shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.

(7) The expense of such completion, as so certified by the Consultant, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the work; the balance of such monies, if any, subject to the other provisions of the Contract, to be paid to the Contractor without interest after such completion. Should the expense of such completion, so certified by the Consultant, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, any such excess shall be paid by the Contractor to the Fund upon demand.

(8) In the event the Fund shall determine to complete the work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said work shall be wholly completed and accepted by the Fund.

(9) In case the Fund shall declare the Contractor in default as to a part of the work only, the Contractor shall discontinue such part, shall continue performing the remainder of the work in strict conformity with the terms of the Contract, and shall in no way hinder or interfere with any other contractors or persons whom

the Fund may engage to complete the work as to which the Contractor was declared in default.

(10) The provisions relating to declaring the Contractor in default as to the entire work shall be equally applicable to a declaration of partial default, except that the Fund shall be entitled to utilize for completion of the part of the work as to which the Contractor was declared in default only such plant, materials, equipment, tools and supplies as had been previously used by the Contractor on such part.

(11) In completing the whole or any part of the work, the Consultant and the Fund shall have the power to depart from, change or vary the terms and provisions of the Contract; provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variations, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Consultant's certificate of the cost of completion, nor shall it constitute a defense to any action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for its default.

(12) The provisions of this Section shall be in addition to any and all other legal or equitable remedies provided by this Agreement and otherwise applicable by law.

Section 2.27 Termination for Convenience

(1) The performance of work under this Contract may be terminated by the Fund, in whole or in part, whenever the Fund shall determine that such termination is in the best interest of the Fund. Any such termination shall be affected by a notice in writing to the Contractor specifying the date upon which such termination shall become effective and the extent to which performance of the Contract shall be terminated. Such termination shall be effective on the date and to the extent specified in said notice.

(2) Upon receipt of a notice of termination, and except as otherwise directed in writing by the Fund, the Contractor shall:

- a. Discontinue all work and the placing of all orders for materials and facilities otherwise required for the performance thereof,
- b. Cancel all existing orders and subcontracts to the extent such orders and subcontracts relate to the

performance of work terminated by the notice of termination;

- c. Take such action as may be necessary to secure to the Fund the benefits of any rights of the Contractor under orders or subcontracts which relate to the performance of work terminated by the notice of termination, including, but not limited to, the assignment to the Fund, in the manner and to the extent directed by the Fund, all the right, title and interest of the Contractor under the orders or subcontracts so terminated and cancelled. In the event of such assignment, the Fund shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination and cancellation of such orders and subcontracts;
- d. Transfer title and deliver to the Fund, in accordance with the direction of the Fund, all materials, supplies, work in process, facilities, equipment, machines or tools produced as a part of or acquired by the Contractor in connection with the work terminated by said notice, and all plans, Drawings, Working Drawings, sketches, Specifications and information for use in connection therewith; provided, however, that the Contractor may retain any of the foregoing if it so elects and foregoes reimbursement therefor;
- e. Take such action as may be necessary or as the Consultant or the Fund may prescribe for the protection and preservation of all property in the possession or control of the Contractor in which the Fund, under the provisions of the Contract, has or may acquire an interest.

(3) Notwithstanding the foregoing, should the notice of termination relate to only a portion of the work covered by the Contract, the Contractor will proceed with the completion of such portions of the work as are not terminated.

(4) The Fund will pay and the Contractor shall accept, in full consideration for the performance and completion of the portions of the work as are not terminated, a sum calculated by determining the percentage the portions of the work not terminated bear to the total amount of the work covered by the Contract, and by multiplying the Contract consideration by such percentage - the product thereof being the amount to be paid to the Contractor. The Fund shall determine the amount of such consideration in accordance with the foregoing.

(5) Upon compliance by the Contractor with the foregoing provisions of this Section and subject to

deductions for payments previously made, the Fund, for the portions of the work terminated, shall compensate the Contractor as follows:

- a. By reimbursing the Contractor for actual expenditures made with respect to such work, including expenditures made in connection with any portion thereof which may have been completed prior to termination, as well as expenditures made after termination in completing those portions of the work covered by the Contract which the Contractor may have been required by the notice of termination to complete. The Fund shall determine the allowability and amount of such expenditures.
- b. By reimbursing the Contractor for all actual expenditures made, with the prior written approval of the Fund or pursuant to a court judgment, in settling or discharging any outstanding contractual obligations or commitments incurred or entered into by the Contractor in good faith with respect to the Contract and resulting from the termination thereof.
- c. By reimbursing the Contractor for all actual expenditures made after the effective date of the notice of termination resulting from or caused by the Contractor taking necessary action or action prescribed by the Consultant or the Fund for the protection and preservation of all property in the possession or control of the Contractor in which the Fund, under the provisions of the Contract, has or may acquire an interest.
- d. By paying the Contractor a markup, which is to be calculated in the same manner as that provided for in subdivision c of paragraph (1) of Sections 4.02 and 4.05A for extra work, on the foregoing expenditures, which markup is to cover the Contractor's overhead and profit; provided, however, that if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, said markup shall be reduced by one-third.

(6) The sum of all amounts payable under this Section, plus the sum of all amounts previously paid by the Fund under the provisions of the Contract, shall not exceed the amount of the Contract consideration. In no event shall the Contractor be entitled to any payment for loss of anticipated profits on uncompleted work and the Fund shall not be liable for same.

(7) Termination by the Fund under the provisions of this Section shall be without prejudice to any claims

or rights which the Fund may have against the Contractor. The Fund may retain from the amount due to the Contractor under the provisions of this Section such monies as may be necessary to satisfy any claim which the Fund may have against the Contractor in connection with the Contract; provided, however, that the Fund's failure to retain such monies shall not be deemed a waiver of any of its rights or claims against the Contractor.

(8) Notwithstanding the foregoing, where the Contractor and the Consultant can agree upon another method of determining the amount of the consideration to be paid to the Contractor under the provisions of this Section, such method, subject to the approval of the Fund, may, at the option of the Fund, be substituted for the method set forth above.

Article III Time of Performance

Section 3.01 Commencement, Prosecution and Completion of Work

(1) The Contractor agrees that it will begin the work herein embraced upon receipt of the Notice to Proceed, unless the Fund consents, in writing, to begin at a different date, and that it will prosecute the same with such diligence that all work covered by the Contract shall be substantially completed and performed on or before the time specified on page A-1 of the Agreement.

(2) The Contractor further agrees that time is of the essence in this Contract and that all the Work shall be prosecuted in such manner and with sufficient plant and forces to complete all Work timely.

Section 3.02 Time Progress Schedule

(1) To show compliance with the requirements of Section 3.01 of the Agreement, provide and maintain a Time Progress Schedule in accordance with the General Requirements, Special Conditions, Section paragraph titled "Project Schedule". Unless otherwise accepted by the Fund, the Time Progress Schedule shall be strictly adhered to by the Contractor. The time for substantial completion shall be on or before the time specified on page A-1 of the Agreement.

(2) If through the fault of the Contractor or any subcontractor the Contractor shall fail to adhere to the time progress schedule, it must promptly adopt such other and additional means and methods of construction as will make up for the time lost and will assure completion in accordance with such schedule.

(3) The failure of the Contractor to submit a Time Progress Schedule, the Fund's or the Consultant's acceptance of the Contractor's time progress schedule or lack of such acceptance, the means and/or methods of construction employed by the Contractor, including any revisions thereof, and/or its failure to revise the same shall not relieve the Contractor of its obligation to accomplish the result required by the Contract in the time specified on page A-1 of the Agreement, nor shall the exercise of the Consultant's or the Fund's right to reject any portion of the work, create or give rise to any claim, action or cause of action, legal, equitable or otherwise, against the Consultant or the Fund.

(4) The failure of the Contractor to submit and maintain a Time Progress Schedule in accordance with the General Requirements shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work.

Section 3.03 Time Progress Schedule for Shop Drawings and Samples

The Contractor shall include activities for preparation and submission of all Shop Drawings, mock-ups and Samples in the Time Progress Schedule in Section 3.02.

Section 3.04 Notice of Conditions Causing Delay

(1) Within ten (10) working days after the commencement of any condition which is causing or may cause delay in completion or require Contractor to request an extension of time, the Contractor must notify the Consultant and the Fund in writing of the effect, if any, of such condition upon the Time Progress Schedule, and must state why and in what respects, if any, the condition is causing or may cause such delay.

(2) Contractor agrees that an express condition precedent to Contractor's entitlement to any extension of time on the project shall be full and complete compliance to the satisfaction of the Fund with the Contractor's obligations in Section 3.06, Contractor's Progress Reports. Failure to submit proper Contractor's progress reports in appropriate and timely fashion shall be deemed a waiver and relinquishment of any right, claim or privilege to obtain an extension of time for the performance of the Contractor's work.

(3) Failure to strictly comply with this requirement may, in the discretion of the Fund, be deemed sufficient cause to deny any extension of time on account of delay in completion arising out of or resulting from any change, extra work, suspension, or other condition.

(4) Except as otherwise set forth in this Section 3.04 all procedures set forth in Sections 2.02 and 2.03 of this Agreement shall be complied with by the Contractor. Furthermore, full and complete compliance with the requirements of this Article III is a condition precedent to the Contractor's entitlement to receive an extension of time.

Section 3.05 Extension of Time

(1) Within ten (10) working days after the commencement of any condition which is causing or may cause the Contractor to incur, require or otherwise need an extension of time, the Contractor shall notify the Consultant and the Fund of such condition. Full and complete compliance with this paragraph 3.05(1) is a condition precedent to the Contractor obtaining an extension of time for performance of any portion or all of its work.

(2) An extension or extensions of time for the completion of the work may be granted by the Fund subject to the provisions of this Section, but only upon written application therefor by the Contractor to the Fund and the Consultant.

(3) An application for an extension of time must set forth in detail the source and the nature of each alleged cause of delay in the completion of the work, the date upon which each such cause of delay began and ended and the number of days of delay attributable to each of such causes. It must be submitted prior to completion of the work.

(4) If such an application is made, the Contractor may be entitled to an extension of time for delay in completion of the work caused solely: (a) by the acts or omissions of the Fund, its trustees, officers, agents or employees; or (b) by the acts or omissions of other contractors, not including subcontractors of the Contractor, on this Project; or (c) by unforeseeable supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes).

(5) The Contractor may, however, be entitled to an extension of time for such causes only for the

number of calendar days of delay which the Fund may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section and Section 3.04. The Fund shall make such determination within ninety (90) calendar days after receipt of the Contractor's application for an extension of time; provided, however, said application complies with the requirements of this Section.

(6) The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the Fund, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of its subcontractors or material-men and would of itself (irrespective of the concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such an act, fault or omission.

(7) The granting of an application for an extension of time for causes of delay other than those herein referred to shall be entirely within the discretion of the Fund.

(8) If the Contractor shall claim to have sustained any damages by reason of delays, extraordinary or otherwise, or hindrances which it claims to be due to any action, omission, direction or order by the Fund or the Consultant, the Contractor shall be entitled only to an extension of time as hereinabove provided and shall not have or assert any claim or prosecute any suit, action, cause of action or proceeding against the Fund based upon such delays or hindrances, unless such delays or hindrances were caused by the Fund's bad faith or its willful, malicious, or grossly negligent conduct, or un contemplated delays, or delays so unreasonable that they constitute an intentional abandonment of the Contract by the Fund, or delays resulting from the Fund's breach of a fundamental obligation of the Contract.

(9) The Contractor shall not be entitled to an extension of time for the performance of any or all of the Work set forth in allowances to the Contract. All allowance work shall be performed in accordance with the Contractor's schedule.

Section 3.06 Contractor's Progress Reports

After commencement of the work the Contractor shall furnish the Consultant with written monthly reports

setting forth the condition and progress of the work, the percentage of each part of the work that has been finished, those parts of the work which have been completed within the scheduled time and those parts of the work which have not been finished within the scheduled time, and the general progress of the work that is being performed away from the site and the approximate date when such work will be finished and delivered to the site. Contractor agrees that compliance with this Section 3.06 is an express condition precedent to the Contractor's right, claim or entitlement to obtain an extension of time for the performance of the Contractor's work. Failure to comply with this Section 3.06 shall be a waiver and relinquishment of all such rights, claims and privileges to request or obtain an extension of time for the performance of Contractor's work.

Article IV Payment

Section 4.01 Compensation to Be Paid Contractor

The Fund shall pay to the Contractor and the latter shall accept as full and complete payment for the performance of this Contract, subject to additions or deductions as provided herein, the sum of

which sum is the amount of the Contract consideration.

Section 4.02 Value of Omitted and Extra Work

(1) The amount by which the Contract consideration is to be increased or decreased by any Change Order or Field Order shall be determined by the Fund by one or more of the following methods:

- a. By applying the applicable price or prices set forth on the attached Schedule "I" of this Agreement or by applying a unit price agreed to by both parties. Subject to the provisions of Section 4.04, this method must be used if the Contract Documents contain applicable unit prices.
- b. By estimating the fair and reasonable cost of: (i) labor, including all wages, required wage supplements and insurance required by law (workers' compensation, social security, disability, unemployment, etc.) paid to or on behalf of foremen, workers and other employees below the rank of superintendent directly employed at the site of the Project; (ii) materials; and (iii) equipment, excluding hand tools, which, in the judgment of the Fund, would have been or will be employed exclusively and directly on the omitted

work or extra work, as the case may be; and, in the case of extra work, where the same is performed directly by the Contractor, by adding to the total of such estimated costs a sum equal to 15 percent thereof, but, where the extra work is performed by a subcontractor, by adding a sum equal to 15 percent of said costs for the benefit of such subcontractor, and by adding, for the benefit of the Contractor (no further allowance will be made where extra work is performed by the sub-subcontractor), an additional sum equal to 10 percent of the first \$10,000 of the above-estimated costs, including the subcontractor's percentage override, plus 5 percent of the next \$90,000 of the total of said items, plus 3 percent of any sum in excess of \$100,000 of the total of said items. There is no markup on the premium portion of overtime labor. For the purposes of the aforesaid percentage overrides, the words "extra work" shall be defined as a complete item of added, modified or changed work as described in the Consultant's written instructions to the Contractor. Such "extra work" may include the work of one or more trades and/or subcontractors or sub-subcontractors and shall include all labor, materials, plant, equipment, tools and all incidentals directly and/or indirectly necessary, related, involved in or convenient to the successful completion of the extra work item. Where the Consultant's aforesaid written instructions to the Contractor involve both an increase and a reduction in similar or related work, the above percentage overrides will be applied only on the amount, if any, the cost of the increased work exceeds the cost of the reduced work.

No overhead and profit shall be retained by the Contractor on the cost of work determined by the method provided in Subparagraph (1)a.

All profit, overhead and expense of whatsoever kind and nature, other than those set forth above in items (i) through (iii), of the Contractor, its subcontractors and sub-subcontractors, are covered by the aforesaid percentage overrides and no additional payment therefor will be made by the Fund.

The Fund may make such cost estimate either before or after the extra work is completed by the Contractor.

- c. By determining the actual cost of the extra work in the same manner as in the above subdivision b except that actual costs of the Contractor shall be utilized in lieu of estimated costs. The Fund shall

have the option to utilize this method provided it notifies the Contractor of its intent to do so prior to the time the Contractor commences performance of such extra work.

(2) Irrespective of the method used or to be used by the Fund in determining the value of a Change Order or Field Order, the Contractor, within fifteen (15) working days after a request for the same, must submit to the Fund and the Consultant a detailed breakdown of the Contractor's estimate of the value of the omitted and/or extra work. All change and field orders must be prepared and submitted using the Fund's Open Item Log (OIL) System.

(3) Equipment Watch Rental Rate Blue Book (published online by Intertec Penton Media, Inc.) or other published rates as approved by the Fund in writing, will be utilized for the equipment rental pricing. For the purposes of paragraph (1) hereof, the cost of equipment shall be determined, irrespective of the actual price for any rental or actual cost associated with such equipment as follows: take the monthly rate listed in Equipment Watch and dividing the same by 176 hours to establish an hourly rate and then multiplying such hourly rate by the actual number of hours that the equipment was used. The Contractor will submit an actual rental invoice, or acceptable quotation from a bonafide equipment rental supplier for rented equipment when equipment is not owned by the Contractor. The equipment rental supplier cannot be an "affiliate" of the Contractor, nor in any way be related to the Contractor. If submitted invoices/quotations are acceptable to the Fund, the Contractor will be reimbursed the actual rental cost including sales tax and appropriate mark-up. If no listing of rates for an item of equipment is contained in Equipment Watch, the Fund shall determine the reasonable rate of rental of the particular item of equipment by such other means as it finds appropriate. The edition Equipment Watch to be used shall be that in effect on the date of the receipt of bids for this Contract. None of the provisions of Equipment Watch shall be deemed referred to or included in this Contract excepting only the aforesaid monthly rates. To the cost of equipment as determined above, there is to be added the actual cost of gasoline, oil, grease and maintenance required for operation of such equipment and, in the case of equipment utilized only for extra work when, in the opinion of the Consultant, suitable equipment therefor was not available on the site, the reasonable cost of transporting said equipment to and from the site. Notwithstanding the foregoing, if the Consultant should determine that the nature or size of the equipment used by the Contractor in connection with the extra work is larger or more

elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Consultant to be suitable for the extra work, the cost of equipment will not be based upon the equipment used by the Contractor but instead will be based on the smallest or least elaborate equipment determined by the Consultant to have been suitable for the performance of the extra work.

(4) Unless otherwise specifically provided for in a Change Order or Field Order, the compensation specified therein for extra work includes full payment for both the extra work covered thereby and for any damage or expense caused the Contractor by any delays to other work to be done under the Contract resulting from or on account of said extra work, and the Contractor waives all rights to any other compensation for said extra work, damage or expense.

Section 4.03 Adjustment for Bond and Insurance Premiums

Upon final acceptance of the work to be performed under this Contract, the Fund may adjust the Contract consideration to reflect any changes in the cost of all required Bonds and liability and builder's risk insurance premiums which the Contractor had to pay for on all extra work and would have had to furnish and pay for on all omitted work. Unless such cost is agreed upon by the Fund and the Contractor, the Fund may calculate and determine the amount of the adjustment in the Contract consideration by estimating such costs. There is no markup on bond or insurance premium adjustment.

Section 4.04 Unit Prices

(1) Except as otherwise provided in the second paragraph of this Section, the unit prices, set forth on the attached Schedule "I" of this Agreement, will be binding upon both the Fund and the Contractor in determining the value of omitted and/or extra work, and, in the case of extra work, such unit prices shall be deemed to include all profit, overhead and expenses of whatsoever kind and nature of the Contractor, its subcontractors and sub-subcontractors, and the Contractor agrees that it shall make no claim for any profit, overhead, expense or percentage override in connection therewith.

(2) Where said Schedule "I" sets forth a unit price for added and/or deducted work, the Fund shall have the option, whenever it is found that the quantity of changed work varies by more than 15 percent from the quantity that is stated or that can be determined by the

Contract Documents at the time of execution thereof, to accept or reject such unit price for the quantity that the changed work varies by more than 15 percent from the stated or determinable quantity. Where a quantity is not specifically stated in the Contract Documents, the Fund's determination of the amount of said quantity included in the Contract Documents shall determine the applicability of this paragraph. Where the Fund, pursuant to the foregoing provisions, exercises its aforesaid option, the amount of the increase or decrease in the Contract consideration for the quantity of work which varies by more than 15 percent from the stated or determinable quantity shall be determined in accordance with the provisions of Section 4.02 of the Agreement as if there was no unit price therefor set forth in said Schedule "I".

Section 4.05 Allowances

(1) The Contractor acknowledges that the Contract consideration includes the allowances set forth on the attached Schedule "II" and "III" of this Agreement and, except for quantitative and field order allowances, it agrees to cause the work covered thereby to be done by such contractors for such sums as the Fund may direct. Where cash allowances are provided, the allowances shall be deemed to include the purchase of the materials and/or equipment and the delivery of same to the job site. Unless otherwise specified in the Contract Documents, cash allowances do not include the proper installation of the materials and/or equipment or the connection for final utilities thereto; the cost of said installation and/or connection having been included in the amount of the Contract consideration.

(2) The Contractor acknowledges that the Contract consideration includes such sums for expenses and profit on account of cash allowances as it deems proper and that it shall make no claim for expenses or profit or any percentage override in addition thereto; said items having been included in the amount of the Contract consideration.

(3) In the event any of the cash allowances listed below are either higher or lower than the cost of having the work done in accordance herewith, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be the difference between the amount of the allowance and the actual cost of performing the work covered thereby.

(4) When quantitative allowances are provided, progress payments thereof to the Contractor will be based upon the applicable unit prices set forth on the

attached Schedule "I" of the Agreement, subject, however, to the provisions of paragraph (2) of Section 4.04. In the event any of said quantitative allowances are more than or less than the actual quantity of work performed, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be determined in accordance with the provisions of Sections 4.02, 4.04 and 4.05A of the Agreement.

Section 4.05A Field Orders

When the Agreement contains a Field Order Allowance, the bid shall include the amount of such allowance. Said amount shall cover the cost of additional labor, materials and time for contingent activities within the scope of the Agreement as directed and described by the Fund in writing in a Field Order. The Field Order will include a description of the work and the method for determining the value of such work. The value of the work directed under this allowance will be determined by one or more of the provisions of Section 4.02. If the net cost(s) of all Field Orders issued are more or less than the specified amount of the allowance, the Contract sum will be adjusted by Change Order.

Section 4.06 Deductions for Unperformed and/or Uncorrected Work

(1) Without prejudice to any other rights, remedies or claims of the Fund, in the event that the Contractor at any time fails or neglects to supply working forces and materials of the proper quantity and quality necessary, in the opinion of the Consultant or the Fund, to comply with the approved time progress schedule, or fails in any respect to prosecute the work with promptness and diligence or causes by any action or omission the stoppage or delay of or interference with the work of any other contractor having a contract with the Fund, or fails in the performance of any obligations and responsibilities under this Contract, then, and in that event, the Fund, acting itself or through the Consultant, may, upon three (3) working days' notice to the Contractor, either itself provide or have any other contractor, including but limited to the Fund's Job Order Contracting Program, provide any and all labor or materials or both necessary, in its opinion, to correct any aforesaid deficiency of the Contractor, and the Fund will thereafter backcharge the Contractor by issuing a Change Order reducing the amount of the Contract consideration for all costs and expenses it incurs in connection with the correction of such deficiency. The Contractor agrees that the Fund may deduct from any application for payment made by the Contractor, any

and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the Fund together with a markup upon such hard costs in the amount of 15% for services required in connection with the correction of such deficiency(ies).

(2) Notwithstanding any provisions in the Contract Documents to the contrary, if the Fund deems it inexpedient to correct work not done in accordance with the Contract or any work damaged as a result thereof, it shall notify the Contractor of such fact and the latter shall not remedy or correct the same. In such event, however, the amount of the Contract consideration shall be decreased by an amount, determined by the Fund, which is equal to the difference in value of the work as performed by the Contractor and the value of the work had it been satisfactorily performed in accordance with the Contract or which is equal to the cost of performing the corrective work, whichever shall be the higher amount.

Section 4.07 Liquidated Damages

In the event that the Contractor shall fail to substantially complete all the work within the time fixed for such completion on page A-1, or within the time to which such completion may have been extended or in the event that the Contractor abandons the work and the same is not substantially completed within the aforesaid time for such completion, the Contractor must pay to the Fund as damages for each calendar day of delay in completing the work the amount set forth on page A-1. In view of the difficulty of accurately ascertaining the loss which the Fund will suffer by reason of delay in completion of the work hereunder, said sum is hereby fixed and agreed as liquidated damages which the Fund will suffer by reason of such delay and not as a penalty. The Fund may deduct and retain out of the monies which may become due hereunder to the Contractor the amount of any such liquidated damages and, in case the amount which may become due to the Contractor under the provisions of the Contract may be less than the liquidated damages suffered by the Fund, the Contractor shall pay the difference, upon demand, to the Fund.

Section 4.08 Contract Breakdown

Prior to the submission of its first application for a progress payment, the Contractor shall present to the Fund and the Consultant for their approval a detailed schedule showing the breakdown of the Contract consideration. The Contract Breakdown Summary shall be further broken down on separate Fund provided forms as required by the Consultant and the

Fund. Contract Breakdown Summary and supporting forms shall be able to interface with the Fund's electronic payment system. Such schedule must contain the amount estimated for each part of the work and quantity survey for each part of the work. It shall also list the estimated value of the Contractor's guarantee obligations under the provisions of the Contract Documents, which is hereby fixed at \$5,000 or one-half of one percent (1/2%) of the Contract award amount, whichever is the lesser sum. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the Fund and the Consultant and shall not be changed after the Fund and the Consultant have approved the same. The amounts set forth in the schedule will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

Section 4.09 Prompt Payment Requirements

(1) For the purposes of Article XI-A of the State Finance Law, the Controller's Office of the State University Construction Fund, whose mailing address is The State University Plaza, 353 Broadway, Albany, New York 12246, is the Fund's designated payment office. Applications for payment must contain the approval of the Consultant before being submitted to the Fund.

(2) Whenever the Consultant's approval of an application for payment is required under the Contract, the Consultant shall have fifteen (15) calendar days, after receipt of such application, to inspect the work before acting on the application.

(3) Until such time that the Contract is approved by the Fund, the thirty (30) day period, referred to in Article XI-A of the State Finance Law for the payment of invoices without interest, shall not begin.

Section 4.10 Progress Payments

(1) Unless otherwise provided in the Contract, progress payments will be made as the work progresses upon applications submitted by the Contractor and approved by the Consultant and the Fund. Payment of such approved applications shall be made by the Fund within thirty (30) days after such approval has been given.

(2) The Fund shall make progress payments to the Contractor on the basis of such approved applications, less an amount equal to 5 percent thereof, plus an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably

discharged, , together with any back charges and offsets which are deemed necessary or likely to be incurred by the Fund as a result of any failure by the Contractor to fully, completely, accurately and timely perform its work, which it shall reserve from each such payment until all of the work covered by the Contract has been completed.

(3) When the Fund and the Consultant have determined that all the work is substantially completed, or that a substantial portion of the permanent construction has been completed and accepted, the Fund shall make a progress payment to the Contractor, on the basis of an application submitted by the Contractor and approved by the Consultant and the Fund, which shall reduce the unpaid amount due to the Contractor under the terms of the Contract, including all monies retained by the Fund from previous progress payments to the Contractor, to an amount equal to two (2) times the cost, estimated by the Consultant, of performing, in accordance with the Contract, all uncompleted, unaccepted and corrective work, plus an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged. As the remaining items of work are satisfactorily completed or corrected, the Fund shall make progress payments to the Contractor, on the basis of applications submitted by the Contractor and approved by the Fund and the Consultant, covering said items of work less an amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

Section 4.11 Applications for Progress Payments

The Contractor shall prepare all applications for progress payments for work performed, together with supporting data and computations as are deemed necessary by the Consultant to determine the accuracy of the application. The application for payment and all required supporting documentation shall be submitted using the Fund's prescribed forms and electronic payment system. The Contractor shall include with such applications reports detailing actual payments to minority and women-owned businesses who participate on Fund projects. Failure of the Contractor to submit applications for progress payments, or lack of complete and accurate supporting data, shall be sufficient reason for withholding payment until such omissions or errors are rectified. Unless otherwise directed, such applications, signed and certified as correct by the Contractor, shall be delivered by the Contractor to the

Consultant once each month showing the total value of work completed and in place on the last day of the payment period covered by the application.

Section 4.12 Progress Payments for Materials Delivered to Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment to be furnished and installed under the Contract, after such materials and equipment have been delivered and accepted at the site of the work.

(2) Materials and equipment for which such progress payment has been made shall not be removed from the site, shall be stored until incorporated into the work in a location approved by the Consultant and shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever, and shall at all times be available for inspection by the Consultant and the Fund.

Section 4.13 Transfer of Title to Materials Delivered to Site

Title to all supplies and materials to be furnished or provided by the Contractor to the Fund pursuant to the provisions of the Contract Documents shall immediately vest in and become the sole property of the Fund upon delivery of such supplies and materials to the site. Notwithstanding such transfer of title, the Contractor shall have the full continuing responsibility to install such materials and supplies, protect them, maintain them in proper condition and forthwith repair, replace and make good any damage thereto without cost to the Fund until such time as the work covered by the Contract is fully accepted by the Fund. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that, after title has passed to the Fund, any of such supplies and materials are rejected as being defective or otherwise unsatisfactory, title to all such supplies and materials shall be deemed to have been transferred back to the Contractor.

Section 4.14 Progress Payments for Materials Stored Off Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment which are in short and/or critical supply or have been specially fabricated for the Project. Materials and equipment, for which a progress payment is made pursuant to the preceding sentence, shall be stored by the Contractor, after fabrication, until

such time as their delivery to the site is required, at a facility and location approved by the Consultant; shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever; and shall at all times be available for inspection by the Consultant and the Fund. No progress payment shall, however, be made for said materials and equipment until:

- a. The Contractor furnishes to the Fund a bill of sale listing quantity and costs of said materials and equipment f.o.b. point of origin;
- b. The Consultant shall have inspected said materials and equipment and recommended payment therefor; and
- c. The Contractor furnishes to the Fund a builder's risk insurance policy, with the broad form extended coverage endorsement, for said materials and equipment, in an amount equal to 100 percent of the value thereof, which policy shall be maintained, at the sole cost and expense of the Contractor, until said materials and equipment have been incorporated into the Project. The said insurance policy shall contain a provision that the loss, if any, is to be made adjustable with and payable to the Fund as trustee for the insured, i.e., the Fund and the Contractor, and a provision that it shall not be changed or cancelled and that it will be automatically renewed upon expiration and continued in force unless the Fund is given thirty (30) days written notice to the contrary.
- d. The Contractor shall develop and provide a preventive maintenance log for stored equipment when determined appropriate by the Consultant. The Contractor shall provide timely notification and opportunity for the Consultant and the Fund to view the Contractor's preventative maintenance efforts.

(2) Materials and equipment for which a progress payment has been made by the Fund pursuant to this Section shall be, become and remain the sole property of the Fund; provided, however, that the Contractor shall have the full continuing responsibility to install such materials and equipment, to deliver it to the site, to protect it, to maintain it in proper condition and to forthwith repair, replace and make good any damage thereto without cost and/or additional time to the Fund until such time as the work covered by the Contract is fully accepted by the Fund. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract.

Section 4.15 Withholding of Progress Payments

Notwithstanding anything contained in the Contract to the contrary, the Fund may withhold payment of all or any part of a progress, final or guarantee payment, in such an amount as it may deem proper to enforce the provisions of the Contract and to satisfy the claims of third parties, when:

- a. The Fund shall learn of any claim, of whatsoever nature or kind, against the Fund or the Contractor, which in any way arises or is alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract or out of or in connection with the Contractor's operations or performance at or in the vicinity of the construction site, that, in the opinion of the Fund, may not be adequately covered by insurance.

If an action on such claim is timely commenced and the liability of the Fund and/or the Contractor shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the Fund shall pay such judgment or admitted claim out of the monies retained by it under the provisions of the Contract and return the balance, if any, without interest, to the Contractor.

The Fund may withhold from the Contractor any payments retained by it until such time as all such claims are either satisfied or barred by law from being presented. At such time the Fund, upon written demand by the Contractor, shall return to the Contractor the amount so withheld, without interest.

- b. The Contractor has not complied with any lawful or proper direction of the Consultant or the Fund or their representatives concerning the work covered by the Contract or the performance of the Contract or the production of records as required under the provisions of the Contract.
- c. There exists any of the conditions, listed in Section 2.26, which would allow the Fund to declare the Contractor in default of the whole or any part of the work.
- d. The Contractor is a foreign contractor and has not furnished satisfactory proof that all taxes due by such Contractor under the provisions of the Tax Law have been paid. The Certificate of the New

York State Tax Commission to the effect that all such taxes have been paid shall be conclusive proof of the payment of such taxes. The term "foreign contractor" as used herein means, in the case of an individual, a person who is not a resident of the State of New York; in the case of a partnership, one having one or more partners not a resident of the State; and in the case of a corporation, one not organized under the laws of the State of New York.

- e. The Contractor, upon request of the Fund at any time after the initial progress payment by the Fund to the Contractor, fails to furnish the Fund with such documentary evidence that the Fund may deem necessary to prove to it that material and labor paid for by the Fund under previous applications for payment submitted have been paid for by the Contractor and that there are no outstanding claims or liens in connection therewith or fails to satisfy the Fund that the Contractor, with good cause, has sufficiently provided for the payment and/or satisfaction of claims for said material and labor.

Section 4.16 Lien Law

The attention of the Contractor is specifically called to the provisions of the Lien Law of the State of New York, wherein funds received by a Contractor for a public improvement are declared to constitute trust funds in the hands of such Contractor to be applied first to the payment of certain claims.

Section 4.17 Substitution of Securities for Retainage

Any time after 50 percent of all the work has been completed, the Fund, if the progress and performance of the work is satisfactory to it, on request of the Contractor, will allow the Contractor to withdraw up to 50 percent of the aforesaid amount retained by the Fund by depositing with the Comptroller of the State of New York government securities, of the type and kind specified in Section 139 of the State Finance Law, having a market value not exceeding par, at the time of deposit, equal to the amount so withdrawn. The Comptroller of the State of New York shall, from time to time, collect all interest or income on the obligations so deposited, and shall pay the same, when and as collected, to the Contractor. If the deposit be in the form of coupon bonds, the coupons as they respectively become due shall be delivered to the Contractor; provided, however, that the Contractor shall not be entitled to interest or coupons or income on any of the deposited securities, the proceeds of

which have or will be used or applied by the Fund. In the event that the Contractor does not, in accordance with the terms and provisions of the Contract, comply with and fulfill all of its obligations and responsibilities thereunder, the Comptroller of the State of New York shall have the right to sell, assign, transfer or otherwise dispose of the aforesaid securities and the Fund shall have the right to use and apply all or any part of the monies obtained by the Comptroller of the State of New York from such a sale, assignment, transfer or disposition or from the collection of interest or income from said securities to the performance and fulfillment of said obligations and responsibilities. Notwithstanding the foregoing, when the Fund makes a payment under Section 4.10 (3) of the Agreement, it will return to the Contractor, as part of such payment, its substituted securities, and thereafter all retention of the Fund shall be in funds and not in substituted securities.

Section 4.18 Final Payment

Upon acceptance of all the work, except for the Contractor's guarantee obligations under Section 2.25 of the agreement and the Contractor's guarantee obligations under any provision of the Specifications, the Contractor shall prepare and submit to the Fund and the Consultant, for their approval, a final application for payment, which the Fund, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to 100 percent of the Contract consideration excluding the Contractor's guarantee obligations, less:

- a. All previous payments by the Fund to the Contractor;
- b. All deductions authorized to be made by the Fund under the Contract; and
- c. An amount necessary, in the Fund's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.
- d. The Contractor shall not be entitled to any interest on the monies retained by the Fund pursuant to Subdivision c of Section 4.18 of the Agreement.

Section 4.19 Acceptance of Final Payment

(1) The acceptance by the Contractor, or by any one claiming by or through it, of the final payment shall, except with respect to the amount retained by the Fund pursuant to the provisions of subdivisions b and c of Section 4.18 of the Agreement, constitute and

operate as a release to the Fund from any and all claims of any liability for anything theretofore done or furnished for or relating to or arising out of the work covered by the Contract and for any prior act, neglect or default on the part of the Fund or any of its trustees, officers, agents or employees in connection therewith.

(2) Should the Contractor refuse to accept the final payment as tendered by the Fund or should the Contractor refuse to execute the final application for payment without protest and without reserving any rights or claims against the Fund, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said final application for payment.

Section 4.20 Guarantee Payment

(1) Subject to the provisions of the second paragraph of this Section, at the expiration of one (1) year after the Fund has accepted all the work covered by the Contract, the Contractor shall prepare and submit to the Fund and the Consultant, for their approval, a guarantee application for payment, which the Fund, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to the monies retained by the Fund for the Contractor's guarantee obligations under the Agreement, less any monies deducted by the Fund under this Section. The Contractor shall not be entitled to any interest on the monies retained by the Fund pursuant to subdivision c of Section 4.18 of the Agreement.

(2) In the event the Contractor does not, in accordance with the terms and provisions of the Contract, complete all corrective work or comply with and fulfill its contractual obligations, the Fund may use and apply all or any part of the monies retained by it to have such work or obligations performed or fulfilled by a person, firm or corporation other than the Contractor. The obligations of the Contractor, under the terms and provisions of the Contract, shall not, however, be limited to the monies retained by the Fund pursuant to the provisions of the Contract.

(3) No payments may be made under this agreement for work completed more than 365 days after the completion date unless the date/duration listed on page A-1, is extended in writing by the Fund.

Section 4.21 Acceptance of Guarantee Payment

The acceptance by the Contractor or by anyone claiming by or through it, of the guarantee payment shall constitute and operate as a release to the Fund

from any and all claims in connection with monies retained by the Fund. Should the Contractor refuse to accept the guarantee payment as tendered by the Fund or should the Contractor refuse to execute the guarantee application for payment without protest and without reserving any rights or claims against the Fund, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said guarantee application for payment.

Section 4.22 Contractor Limited to Money Damages

Inasmuch as the Contractor can be compensated adequately by money damages for any breach of the Contract which may be committed by the Fund, the Contractor agrees that no default, act or omission of the Fund shall constitute a material breach of the Contract entitling it to cancel or rescind the same or to suspend or abandon performance thereof; and it hereby waives any and all rights and remedies to which it might otherwise be or become entitled to because of any wrongful act or omission of the Fund or its representatives, saving only its right to money damages.

Section 4.23 No Estoppel or Waiver

(1) The Fund shall not be precluded or estopped by any inspection, acceptance, application for payment or payment, final or otherwise, issued or made under the Contract or otherwise issued or made by it, the Consultant, or any trustee, officer, agent or employee of the Fund, from showing at any time the true amount and character of the work performed, or from showing that any such inspection, acceptance, application for payment or payment is incorrect or was improperly issued or made; and the Fund shall not be precluded or estopped, notwithstanding any such inspection, acceptance, application for payment or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on its part to comply strictly with the Contract and any monies which may be paid to it or for its account in excess of those to which it is lawfully entitled.

(2) Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefor; nor any order or application for payment issued under the Contract or otherwise issued by the Fund, the Consultant, or any trustee, officer, agent or employee of the Fund; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the Fund of any of the Contractor's

duties or obligations; nor any aid lent to the Contractor by the Fund in its performance of such duties or obligations; nor any delay or omission by the Fund to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise; nor any other thing done or omitted to be done by the Fund, its trustees, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the Performance Bond or a waiver of any provision of the Contract or of any rights or remedies to which the Fund may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the Fund may be entitled because of such breach. No waiver by the Fund of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.

Section 4.24 Limitation of Actions

(1) No action or proceeding shall be maintained by the Contractor, or anyone claiming under or through the Contractor, against the Fund, or its trustees, officers, agents or employees, upon any claim arising out of or based upon the Contract or any breach thereof or by reason of any act or omission or requirement of the Fund, or its trustees, officers, agents or employees, unless:

- a. Such action or proceeding is instituted in the Supreme Court of the State of New York in and for the County of Albany;
- b. The Contractor or the person claiming under or through it shall have strictly complied with all requirements relating to the giving of notices and information with respect to such claims and shall have provided the Fund with both electronic and hard copy versions of any claims, including all required information and electronic and hard copy versions of all contractually required notices that the Contractor provided to the Fund and the Consultant throughout the duration of the Contract ;
- c. Such action or proceeding by the Contractor shall be commenced within eighteen months after the date of substantial completion set by the Fund or its Consultant and issued in writing to the Contractor. Any action or proceeding not

commenced within this time frame shall be dismissed with prejudice;

- d. If the Contract is terminated or the Contractor declared in default by the Fund, such action is commenced within six (6) months after the date of such termination or declaration of default by the Fund; and
- e. All claims and disputes which are subject to or related to this Contract and the Project shall be subject to non-binding mediation, at the sole option and discretion of the Fund. Should the Fund at its sole option and in the exercise of its sole discretion elect to mediate under this clause, then a letter from the Fund indicating the completion of such mediation shall be a condition precedent to any litigation by Contractor against the Fund or the State of New York. In the absence of the Fund exercising its right to proceed to mediation, the condition precedent to any litigation against the Fund of the State of New York, shall be a letter citing that the Fund declines its rights under this clause. The costs of any mediation shall be paid equally by the parties to the mediation.

(2) Notwithstanding anything in the laws of the State of New York to the contrary, the Contractor, or anyone claiming under or through the Contractor, shall not be entitled to any additional time to begin anew any other action if an action commenced within the times herein specified is dismissed or discontinued for any reason whatsoever.

Section 4.25 Electronic Payments

The Contractor shall provide complete and accurate payment applications in order to receive payment. Payment applications submitted must contain all information and supporting documentation required by the Fund. Payment for applications submitted by the Contractor shall only be rendered electronically unless payment by paper check is expressly authorized by the Fund's General Manager, in the General Manager's sole discretion, due to extenuating circumstances. Such electronic payment shall be made in accordance with ordinary State procedures and practices. The Contractor shall comply with the State Comptroller's procedures to authorize electronic payments. Authorization forms are available at the Office of the State Comptroller's website at www.osc.state.ny.us/epay/index.htm; by email at epunit@osc.state.ny.us; or by telephone at 518-474-4032. The Contractor acknowledges that it will not receive payment on any invoices submitted under this Contract if it does not comply with the State

Comptroller's electronic payment procedures, except where the Fund's General Manager has expressly authorized payment by paper check as set forth above.

Article V

Protection of Rights and Property

Section 5.01 Accidents and Accident Prevention

The Contractor shall at all times take reasonable precautions for the safety of persons engaged in the performance of the work. The Contractor shall comply fully with all applicable provisions of the laws of the State of New York and OSHA and with all valid rules and regulations thereunder. The Contractor's attention is specifically called to the applicable rules and regulations, codes and bulletins of the New York State Department of Labor.

Section 5.02 Adjoining Property

The Contractor shall be required to protect all the adjoining property and to repair or replace any such properties damaged or destroyed by it, its employees or subcontractors through, by reason of or as a result of activities under, for or related to the Contract.

Section 5.03 Emergencies

(1) In case of an emergency which threatens loss or injury to persons or property, the Contractor will be allowed to act, without previous instructions from the Consultant or the Fund, in a diligent manner, to the extent required to avoid or limit such loss or injury, and it shall notify the Consultant and the Fund immediately thereafter of the action taken by it and of such emergency. Where the Contractor has not taken action but has notified the Consultant or the Fund of an emergency which threatens loss or injury to persons or property, it shall act in accordance with the instructions and/or authorization by the Consultant or the Fund.

(2) In the event that the Contractor performs extra work in accordance with the preceding paragraph, it will be compensated therefor in accordance with the provisions of Section 4.02.

Section 5.04 Fire Safety

(1) Contractor shall comply with the General Requirements, Section paragraph titled Temporary Fire Protection.

(2) Solid fuel salamanders and heaters shall not be used by the Contractor or any of its subcontractors. All other salamanders used by the Contractor or any of its subcontractors shall require constant attendance of competent persons on each floor where in use.

(3) All temporary fabric used by the Contractor or any of its subcontractors for curtains or awnings shall be either non-combustible or flame retarded so that it will not burn or propagate flame.

Section 5.05 Risks Assumed by Contractor

(1) To the fullest extent permitted by law, the Contractor solely assumes the following distinct several risks whether they arise from acts or omissions (whether negligent or not and whether supervisory or otherwise) of the Contractor, of the Fund, of third persons or from any other cause, including unforeseen obstacles and difficulties which may be encountered in the prosecution of the work covered by the Contract, whether such risks are within or beyond the control of the Contractor and whether such risks involve a legal duty, primary or otherwise, imposed upon the Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York, excepting only risks which arise from defects in maps, plans, designs or Specifications prepared, acquired or used by the Consultant or the Fund, from the negligence of the Fund, its agents or employees or from affirmative acts of the Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York or their trustees, officers, agents or employees committed with intent to cause the loss, damage and injuries herein below set forth:

a. The risk of loss or damage, direct or indirect, to the work covered by the Contract or to any plant, equipment, tools, materials or property furnished, used, installed or received by the Fund or by the Contractor or any subcontractor, material man or worker performing services or furnishing materials for the work covered hereunder. The Contractor shall bear such risk of loss or damage until the work covered by the Contract has been finally accepted by the Fund or until completion of removal of such plant, equipment, tools, materials or property from the construction site and the vicinity thereof, whichever event occurs last. In the event of such loss or damage, the Contractor shall forthwith repair, replace and/or make good any such loss or damage without cost to the Fund.

b. The risk of claims, just or unjust, by third persons against the Contractor, the Fund, the Dormitory

Authority of the State of New York, the State of New York, or the State University of New York on account of wrongful death, bodily injuries and property damage, direct or consequential, loss or damage of any kind whatsoever arising or alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract (whether actually caused by or resulting from the performance of the Contract) or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site.

(2) To the fullest extent permitted by law, the Contractor shall indemnify and save harmless the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees against all claims described above and for all costs and expenses incurred by them in the defense, settlement or satisfaction thereof, including attorneys' fees and court costs. If so directed, the Contractor shall at its own expense defend against such claims, in which event it shall not, without obtaining express advance permission from Counsel of the Fund, raise any defense involving in any way jurisdiction of the tribunal over the Fund, governmental nature of the Fund or the provisions of any statutes respecting suits against the Fund.

(3) Neither the Fund's final acceptance of the work to be performed hereunder nor the making of any payment shall release the Contractor from its obligations under this Section. The enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which it is responsible shall not be deemed to limit the effect of the provision of this Section or to imply that it assumes or is responsible for only risks or claims of the type enumerated.

Section 5.06 Compensation and Liability Insurance

(1) General Requirements

a. Prior to the commencement of the work to be performed by the Contractor, the Contractor shall procure at its sole cost and expense, and maintain in force at all times during this Agreement until Final Payment and as further required by the Contract, policies of insurance as herein set forth below. All insurance shall be written by insurance carriers approved by the Fund, licensed to do business in the State of New York ("admitted"

carriers), and rated at least "A-" by A.M. Best Company.

- b. Prior to the commencement of the work, the Contractor shall submit to the Fund, certificates of insurance, in a form acceptable to the Fund, showing evidence of compliance with all insurance requirements contained in this Agreement. Certificates of Insurance (with the exception of Workers' Compensation and Disability) must be provided on an ACORD 25 Certificate of Insurance, or an equivalent form. Certificates of Insurance shall disclose any deductible, self-insured retention, aggregate limit or any exclusion to the policy that materially changes the coverage required by the Contract; specify the additional insureds and named insureds as required herein; and be signed by an authorized representative of the insurance carrier or producer. Deductibles or self-insured retentions above \$25,000 are subject to approval by the Fund and additional security may be required. Certificates shall reference the Contract number. Only original documents will be accepted.
- c. All insurance shall provide that the required coverage apply on a primary and not on an excess or contributing basis as to any other insurance that may be available to the Fund for any claim arising from the Contractor's work under this Agreement, or as a result of Contractor's activities. Any other insurance maintained by the Fund shall be in excess of and shall not contribute with the Contractor's insurance, regardless of the "other insurance" clause contained in the Fund's own policy of insurance. A copy of the endorsement reflecting this requirement may be requested by the Fund.
- d. Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the Fund with updated replacement certificates of insurance and endorsements. The Contractor shall advise the Fund of any letter or notification that cancels, materially changes, or non-renews the policy and Contractor shall require the insurance carrier(s) to copy the Fund on any letter or notification that cancels, materially changes, or non-renews the policy. If, at any time during the period of the Agreement, insurance as required is not in effect, or proof thereof is not provided to the Fund, the Fund shall have the options to (i) direct the Contractor to stop work with no additional cost or extension of time due on account thereof; or (ii) treat such failure as an event of default under Section 2.26 of the Agreement. At any time the

coverage provisions and limits of the policies required herein do not meet the provisions and limits set forth in the Agreement the Contractor shall immediately cease Work on the Project. The Contractor shall not resume Work on the Project until authorized to do so by the Fund. Any delay or time lost as a result of the Contractor not having insurance required by the Agreement shall not give rise to a delay claim or any other claim against the Fund. If required by the Fund, Contractor shall deliver to the Fund within forty-five (45) days of such request, a copy of any or all policies of insurance not previously provided, certified by the insurance carrier as true and complete.

- e. Should the Contractor engage a subcontractor, the Contractor shall impose the insurance requirements of this document on those entities, as applicable. Required insurance limits should be determined commensurate with the work of the subcontractor. Contractor shall keep the subcontractor certificates of insurance on file and produce them upon the demand of the Fund.
- f. The aggregate insurance limits set forth herein shall apply separately to each contract for which a certificate of insurance and/or policy is issued.
- g. Unless otherwise agreed to in writing by the Fund, policies must be endorsed to provide that there shall be no right of subrogation against the Fund. To the extent that any of the policies of insurance prohibit such a waiver of subrogation, Contractor shall secure the necessary permission to make this waiver.
- h. Except as otherwise specifically provided herein or agreed in writing, policies must be written on an occurrence basis. The insurance policy(ies) shall name the Fund, State University of New York, State of New York, its officers, agents, and employees as additional insureds thereunder. The additional insured requirement does not apply to Workers' Compensation or Disability coverage. Include ISO Endorsement CG 20 10 11 85 or its equivalent.

(2) Specific Coverage and Limits

The Contractor shall obtain and maintain in full force and effect, the following insurance with limits not less than those described below and as required by the terms of the Contract, or as required by law, whichever is greater:

- a. Commercial General Liability Insurance. A Commercial General Liability insurance policy with coverage that shall include, but not be limited to coverage for bodily injury, property damage, personal/advertising injury, premises liability, independent contractors, blanket contractual liability including tort liability of another assumed in Contract, liability arising from all work and operations under this Agreement, defense and indemnification obligations, including those assumed under Contract, cross liability coverage for additional insureds, products/completed operations for a term no less than three years commencing upon acceptance of the work, explosion, collapse, and underground hazards, contractor means and methods, and liability resulting from Section 240 or Section 241 of the NYS Labor Law. The limits under such policy shall not be less than: \$5,000,000 each occurrence; \$5,000,000 general aggregate; and products/completed operations with an aggregate limit of \$5,000,000.
- b. Workers Compensation and Disability Benefits as required by New York State.
- c. Comprehensive Business Automobile Liability Insurance. A policy with a combined single limit for bodily injury and property damage of no less than \$1,000,000 covering liability arising out of the use of any motor vehicle in connection with the work, including owned, leased, hired, and non-owned vehicles bearing, or, under the circumstances under which they are being used, required by the Motor Vehicle Laws of the State of New York to bear license plates. If the Contract involves the removal of hazardous waste from the project site or otherwise transporting hazardous materials, pollution liability coverage for covered autos shall be provided by form CA 99 48 03 06 or CA 00 12 03 06 and the Motor Carrier Act Endorsement (MCS90) shall be attached.
- d. Umbrella and Excess Liability. When the limits of the Commercial General Liability, Auto, and/or Employers Liability policies procured are insufficient to meet the limits specified, the Contractor shall procure and maintain Commercial Umbrella and/or Excess Liability policies with limits in excess of the primary, provided, however, that the total amount of insurance coverage is at least equal to the requirements set forth above. Such policies shall follow the same form as the primary. Any insurance maintained by the Fund or additional insured shall be considered excess of and shall not contribute with any other

insurance procured or maintained by the Contractor including primary, umbrella and excess liability regardless of the "other insurance" clause contained in either party's policy.

- e. **Owner's Protective Liability Insurance.** A policy issued to and covering the liability for damages imposed by law upon the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, with respect to all operations under the Contract by the Contractor and its subcontractors, and/or their interest in the Project and the property upon which work under the Contract is to be performed, including omissions and supervisory acts of the former. Said insurance policy limits shall be no less than \$1,000,000 each occurrence and \$2,000,000 general aggregate.
- f. **Asbestos Abatement Insurance.** A liability insurance policy issued to and covering the liability, of the Contractor and/or subcontractor engaged in the removal, handling or wrapping of asbestos, if any of such work is to be performed under the Contract, for bodily injury, illness, sickness or property damage caused by exposure to asbestos in an amount not less than \$1,000,000 per occurrence and \$2,000,000 aggregate. The Contractor and/or its aforesaid subcontractor shall either obtain an endorsement to the aforesaid required insurance policy adding the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, as additional parties insured thereunder or shall obtain a separate owner's protective liability insurance policy for such parties with coverage similar to that required by the first sentence of this subdivision. In addition, any Contractor or subcontractor engaged in the removal, handling, or wrapping of asbestos shall, to the fullest extent permitted by law, hold harmless and indemnify the Fund, the Dormitory Authority of the State of New York the State of New York and the State University of New York, their trustees, officers, agents or employees, for any claims or liabilities in connection with illness or sickness arising from work performed, not performed, or which should have been performed. The Contractor shall have said hold-harmless and indemnification conditions stipulated in all Contracts with subcontractors.

Section 5.07 Builder's Risk

(1) The Contractor shall procure and maintain, at its own cost and expense, until final acceptance of all work covered by this Contract or until the Project has been turned over for use by the State University of New York, whichever event occurs earlier, a builder's risk insurance policy covering all risks, with fire, extended coverage, vandalism and malicious mischief coverage. In the event the loss occurs at an occupied facility, the policy shall permit occupancy without the consent of the insurance company. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by operation of any law, ordinance, or regulation, and property of the State held in their care, custody and/or control.

(2) The policy shall be in an amount equal to the Project's insurable value, i.e., the Contract consideration less the cost of the Contractor's Performance and Labor and Material Bonds; the cost of trees, shrubbery, lawn grass, plants and the maintenance of the same; the cost of demolition; the cost of excavation; the cost of foundations, piers or other supports which are below the undersurface of the lowest basement floor, or where there is no basement, which are below the surface of the ground, concrete and masonry work; the cost of underground flues, pipes or wiring; the cost of earthmoving, grading and the cost of paving, roads, walks, parking lots or athletic fields; and the cost of bridges, tunnels, dams, piers, wharves, docks, retaining walls and radio and/or television towers and antennas.

(3) The policy may contain a provision for a \$500 deductible for each loss to a Project having an insurable value of less than \$1,500,000 and a \$1,000 deductible for each loss to a Project having an insurable value of \$1,500,000 or more.

(4) The Fund, the Contractor and its subcontractors, as their interests may appear, shall be named as the parties insured under said policy.

(5) The Contractor shall have the sole responsibility to promptly report any loss to the insurer and/or its representatives and to furnish the latter with all necessary details relating to the occurrence of the loss and the amount thereof. The Fund, the Contractor and all subcontractors of the Contractor waive all rights, each against the others, for damages caused by fire or other perils covered by insurance provided under the terms of this Section, except such rights as they may have to the proceeds of insurance received; provided, however, this waiver shall not apply to any

manufacturer, supplier or similar agent under any guarantee or warranty.

(6) The Contractor shall not violate or permit to be violated any condition of such policy and shall at all times satisfy the fire safety requirements of the Fund and the insurance company issuing the same.

(7) The procurement and maintenance of said policy shall in no way be construed or be deemed to relieve the Contractor from any of the obligations and risks imposed upon it by this Contract or to be a limitation on the nature or extent of such obligations and risks.

(8) Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the Fund with an updated replacement certificate of insurance and endorsements. The Contractor shall advise the Fund of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the Fund on any letter or notification that cancels, materially changes, or non- renews the policy. Before the Contractor shall be entitled to have any progress payment rendered on account of the work which is to be insured pursuant to this Section, it shall furnish to the Fund a certificate in duplicate of the insurance herein required. Such insurance must be procured from an insurance carrier approved by the Fund, licensed to do business in the State of New York ("admitted" carrier), and rated at least "A-" by A.M. Best Company.

Section 5.08 Effect of Procurement of Insurance

Neither the procurement nor the maintenance of such insurance shall in any way affect or limit the obligations, responsibilities or liabilities of the Contractor hereunder.

Section 5.09 No Third Party Rights

Nothing in this Section or in this Agreement shall create or give to third parties, except the Dormitory Authority of the State of New York, the State of New York and the State University of New York any claim or right of action against the Contractor, the Consultant, the Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York beyond such as may legally exist irrespective of this Section or this Agreement.

Article VI Minority and Women's Business Enterprises (MWBEs) / Equal Employment Opportunity (EEO) Provisions

Section 6.01 Definitions

The terms "Minority-owned business enterprise" ("MBE"), "Women-owned business enterprise" ("WBE") or "minority group member", and "Subcontract" shall have the same meaning as under Article 15-A of the New York State Executive Law, and 5 NYCRR Parts 140 – 145, as the same may be from time to time amended.

Section 6.02 MWBE/EEO Policy Statement

(1) The Fund recognizes the need to take affirmative action to promote the employment of minority group members and women and to ensure that Minority and Women Business Enterprises are given the opportunity to participate in the performance of its construction program. This opportunity for participation in our free enterprise system by socially and economically disadvantaged persons is essential to obtain social and economic equality and improve the functioning of the State economy. Accordingly, it is the policy of the Fund to provide for participation of minorities and women on the Project.

(2) The Contractor acknowledges its understanding of the policy herein stated and agrees to cooperate with the Fund in the implementation of this policy.

Section 6.03 Participation by Minority and Women's Business Enterprises (MWBEs)/ Equal Employment Opportunity (EEO)

(1) General Provisions

- a. The Fund is required to implement the provisions of New York State Executive Law Article 15-A, 5 NYCRR Parts 140-145 of the New York Codes, Rules and Regulations ("NYCRR"), and Executive Order No. 162 dated January 9, 2017 ("E.O. 162") for all State contracts as defined therein, with a value (1) in excess of \$25,000 for labor, services, equipment, materials, or any combination of the foregoing or (2) in excess of \$100,000 for real property renovation and/or construction.

- b. The Contractor agrees, in addition to any other nondiscrimination provision of the Contract and at no additional cost to the Fund, to fully comply and cooperate with the Fund in the implementation of New York State Executive Law Article 15-A, the regulations promulgated thereunder, and E.O. 162. These requirements include equal employment opportunities for minority group members and women ("EEO") and contracting opportunities for New York State certified minority and women-owned business enterprises ("MWBEs"). Contractor's demonstration of "good faith efforts" pursuant to 5 NYCRR §142.8 shall be a part of these requirements. These provisions shall be deemed supplementary to, and not in lieu of, the nondiscrimination provisions required by New York State Executive Law Article 15 (the "Human Rights Law") and other applicable federal, state or local laws.
- c. Failure to comply with all of the requirements herein may result in a finding of non-responsiveness, non-responsibility and/or a breach of contract, leading to the assessment of liquidated damages pursuant to Section 7 of this Article, withholding of funds and such other remedies as may be available to the Fund pursuant to the Contract and applicable law, including but not limited to bid rejection or contract termination for cause.
- d. Contractor will include the provisions of this Article in each and every agreement, contract, and/or subcontract with each and every subcontractor and supplier in such a manner that the provisions of this Article will be binding upon each subcontractor and supplier as to work in connection with and related to this Agreement. All subcontractors and suppliers must be approved by the Fund and the MWBE Utilization plans are subject to approval by the Fund's Opportunities Program.

(2) Contract Goals

- a. For purposes of this Contract, the Fund hereby establishes goals of ___% for New York State-certified Minority-Owned Business Enterprises ("MBE") participation and ___% for New York State-certified Women-Owned Business Enterprises ("WBE") participation

(collectively "MWBE Contract Goals") based on the current availability of MBEs and WBEs.

- i. The ___% goal for Minority-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from MBEs.
 - ii. The ___% goal for Women-Owned Business Enterprise participation shall be applied as follows: a maximum of one third (1/3) of the goal may be applied to purchases of materials, supplies, and equipment from WBEs.
 - b. For purposes of providing meaningful participation by MWBEs on the Contract and achieving the MWBE Contract Goals established in Section 2a hereof, Contractor should reference the Directory of New York State Certified MWBEs found at the following internet address:
<https://www.ny.newnycontracts.com>.
- Additionally, the Contractor is encouraged to contact the Fund's Opportunities Program Office. The Contractor can also reach out to the Division of Minority and Women's Business Development at (212) 803-2414 to discuss additional methods of maximizing participation by MWBEs on the Contract.
- c. The Contractor understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR §140.1, may be applied towards the achievement of the applicable MWBE participation goal. The portion of a contract with an MWBE serving as a supplier, that shall be deemed to represent the commercially useful function performed by the MWBE, shall be 60 percent of the total value of the contract. The portion of a contract with an MWBE serving as a broker, that shall be deemed to represent the commercially useful function performed by the MWBE, shall be the monetary value for fees, or the markup percentage, charged by the MWBE.
 - d. Where MWBE Contract Goals have been established herein, the Contractor must document "good faith efforts" pursuant to 5 NYCRR §142.8, to provide meaningful participation by MWBE's as

subcontractors and suppliers, in the performance of the Contract. Such documentation shall include, but not necessarily be limited to:

- i. Evidence of outreach to MWBEs,
- ii. Any responses from MWBE's to the Contractor's outreach;
- iii. Copies of advertisements for participation by MWBEs in appropriate general circulation, trade and minority or women-owned publications;
- iv. The dates of attendance at any pre-bid, pre-award or other meetings, if any, scheduled by the Fund with MWBE's; and,
- v. Information describing specific steps undertaken by the Contractor to reasonably structure the Contract Scope of work to maximize opportunities for MWBE participation.

(3) Equal Employment Opportunity (EEO)

- a. The provisions of Article 15-A of the Executive Law, the rules and regulations promulgated thereunder, and E.O. 162 pertaining to equal employment opportunities for minority group members and women, shall apply to the Contract. Contractor agrees to be bound by them. In the event of any conflict, the provisions of the statute, regulations and Executive Order shall govern over any contrary provisions of this Agreement.
- b. In performing the Contract, the Contractor shall:
 - i. Ensure that the Contractor and each contractor and subcontractor performing work on the Contract shall undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, EEO shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.
 - ii. Within seven (7) calendar days after the opening of bids or upon receipt of a

request by the Fund, the Contractor shall have submitted an EEO policy statement to the Fund.

iii. If the Contractor or any of its sub-contractors do not have an existing EEO policy statement, the Fund may require the Contractor or subcontractor to adopt a model statement.

iv. The Contractor's EEO policy statement shall include the following language:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability or marital status, will undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force.

(b) The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

(c) At the request of the Fund, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(d) The Contractor will include the provisions of paragraphs a through c of this subdivision (iv) and paragraph e of this subsection 3 which provides for relevant provisions of the Human Rights Law, in every subcontract in such a manner that the

requirements of the subdivision will be binding upon each subcontractor as to work in connection with the Contract.

c. Staffing Plan

To ensure compliance with Executive Order No. 162, in connection with all low bids in excess of \$250,000, the Contractor shall, as a required condition of contract award, prepare and submit a staffing plan, as part of the Contractor's bid or proposal, or within a reasonable time after the bid opening or proposal submission and prior to final contract award, as directed by the Fund. The Contractor shall do so using the staffing plan form provided by the Fund, to document the composition of the proposed workforce to be utilized in the performance of the Contract by the specified categories listed, including ethnic background, gender, and Federal occupational categories.

d. Monthly Workforce Utilization/Gross Wages Report

i. For each and every real property renovation and/or construction contract in excess of \$100,000, the Contractor shall, during the term of the Contract and as part of the normal course of performing the work of the Contract, submit a monthly Workforce Utilization/Gross Wages Report, and shall require each of its subcontractors to submit a Workforce Utilization/Gross Wages Report in the electronic form prescribed by the Fund on a monthly basis.

ii. Separate forms shall be completed by the Contractor and any subcontractors.

iii. Pursuant to Executive Order #162, in addition to required Equal Employment Opportunity (EEO) information, the Contractor and its subcontractors are also required to include in such monthly reports the job titles and gross wages paid to each of their employees for the work performed by such employees on the contract; or for each and every member of their entire workforce, if they are unable to determine which employees are working directly on the contract for which the report is submitted.

e. Contractor shall comply with the provisions of the Human Rights Law, all other State and

Federal statutory and constitutional non-discrimination provisions. Contractor and sub-contractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

(4) MWBE Utilization Plan

a. The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan for the Fund's approval prior to the execution of the contract and within seven (7) calendar days after receipt of a request thereof.

b. Contractor agrees to adhere to such MWBE Utilization Plan in the performance of the Contract.

c. Contractor further agrees that a failure to submit and/or adhere to such MWBE Utilization Plan may constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, the Fund shall be entitled to any remedy provided herein, including but not limited to, a finding that the Contractor is non-responsive

(5) Waivers

If the Contractor, after making good faith efforts, is unable to achieve the MWBE Contract Goals stated herein, the Contractor may submit a request for a waiver through a method provided by the Fund. Such waiver request must be supported by evidence of the Contractor's good faith efforts to achieve the maximum feasible MWBE participation towards the applicable MWBE Contract Goals. If documentation included with the waiver request is completed, the Fund shall evaluate the request and issue a written notice of approval or denial within twenty (20) business days of receipt.

If the Fund, upon review of the MWBE Utilization Plan, the reports described in Section 6.04, or any other relevant information, determines that the Contractor is failing or refusing to comply with the MWBE Contract Goals, and no waiver has been issued in regards to such non-compliance, the Fund may issue a notice of

deficiency to the Contractor. The Contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE Contract Goals.

(6) Liquidated Damages

- a. Where the Fund determines that Contractor is not in compliance with the provisions of this Article and the Contractor refuses to comply with such requirements, or if the Contractor is found to have willfully and intentionally failed to comply with the MWBE Contract Goals, Contractor shall be obligated to pay liquidated damages to the Fund.
- b. Such liquidated damages shall be calculated as an amount equaling the difference between:
 - i. All sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and
 - ii. All sums actually paid to MWBEs for work performed or materials supplied under the Contract.
- c. In the event a determination has been made which requires the payment of liquidated damages and such identified sums have not been withheld by the Fund, Contractor shall pay such liquidated damages to the Fund within sixty (60) days after they are assessed. Provided, however, that if the Contractor has filed a complaint with the Director of the Division of Minority and Woman Business Development pursuant to 5 NYCRR § 142.12, liquidated damages shall be payable only in the event of a determination adverse to the Contractor following the complaint process.

Section 6.04 Reports, Records and Documentation

- a. The Contractor shall, for each and every real property renovation and/or construction contract in excess of \$100,000, file with the Fund monthly reports in the electronic form prescribed by the Fund, regarding actions taken pursuant to this Article, as well as a list of and value of subcontracts and supply contracts.

- b. The Contractor shall permit access to its books, records and accounts by the Fund for purposes of investigation to ascertain compliance with the provisions of this Article. The Contractor shall include this provision in every subcontract so that such provision will be binding upon each subcontractor.
- c. Failure to comply with the foregoing requirements entitles the Fund to take such action as the withholding of funds, suspension or termination of the Contract or such other actions or enforcement proceedings as allowed by the Contract. Such failure may also result in a finding of non-responsiveness, non-responsibility and/or a breach of the Contract.

**Article VII
Provisions Required by Law**

Section 7.01 Provisions Deemed Inserted

Each and every provision required by law to be inserted in the Contract, including, but not limited to, the applicable provisions set forth in Schedule "A" which is attached hereto and made a part hereof, shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Contract shall forthwith be physically amended to make such insertion or correction.

Section 7.02 Wage Rates

The Contractor shall post the appropriate prevailing wage schedules in a conspicuous place at the construction site. The Department of Labor shall provide the Contractor with posters relating to prevailing wage rates and same shall be displayed by the Contractor in a conspicuous place at the construction site. The Contractor shall also distribute wallet cards, to be provided by the Department of Labor, to all workers engaged at the construction site containing information relating to wage rates and telephone numbers to call if a worker believes his or her rights are being violated. The Contractor shall provide each worker with a written notice, informing them of the applicable prevailing wage requirements, and the Contractor must obtain a signed statement or declaration from such worker attesting to the fact that he or she has been given this information. Further, the Contractor is required to keep certified copies of its payrolls at the construction site.

Section 7.03 Iran Energy Sector Divestment

Pursuant to New York State Finance Law §165-a, Iran Divestment Act of 2012 (Act), the Office of General Services is required to post on its website a list of persons who have been determined to engage in investment activities in Iran ("prohibited entities list"), as defined by the Act. New York State Public Authorities Law § 2879-c, with certain exceptions, prohibits the Fund from entering into or awarding a Contract with persons identified on the prohibited entities list and requires that the person (as defined in paragraph (e) of subdivision one of Section 165-a of the State finance law) entering into the contract with the Fund certify, under penalty of perjury, that it is not on the prohibited entities list. By signing this Agreement with the Fund, each person (as defined in paragraph (e) of subdivision one of Section 165-a of the State finance law) and each person signing on behalf of any other party certifies, and in the case of a joint bid or partnership each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each person is not on the prohibited entities list.

Article VIII Vendor Responsibility

(1) The Contractor shall at all times during the Agreement term remain responsible. The Contractor shall provide the Fund with written notice as required by this Article of any issues impacting its responsibility, which shall minimally include updated responses to the its filed vendor responsibility questionnaire. The Contractor agrees, if requested by the Fund, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance and organizational and financial capacity.

(2) The Fund, at its sole discretion, reserves the right to suspend any or all activities under this Agreement, at any time, when the Fund discovers information that calls into question the responsibility of the Contractor. In the event of such suspension, the Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, the Contractor must comply with the terms of the suspension order. Agreement activity may resume at such time as the Fund issues a written notice authorizing a resumption of performance under the Agreement.

(3) Upon written notice to the Contractor, and a reasonable opportunity to be heard with appropriate Fund officials or staff, the Contractor may be

terminated by the Fund at the Contractor's expense where the Contractor is determined by the Fund to be non-responsible. In such event, the Fund may complete the contractual requirements in any manner that the Fund may deem advisable and pursue available legal or equitable remedies for breach.

(4) In addition to the notice requirements set forth in Section 1.12 of this Agreement, the Contractor shall provide the notice required by this section as follows:

The State University Construction Fund

Attention: Corporate Integrity Officer
Address: 353 Broadway, Albany, NY 12246
Telephone Number: (518) 320-1746
E-mail address: JoAnne.DiStefano@suny.edu

In no case shall termination of the Contract by the Fund be deemed a breach by the Fund thereof, nor shall the Fund be liable for any damages or lost profits or otherwise, which may be sustained by Contractor as a result of such termination.

Article IX Use of Service-Disabled Veteran-Owned Business Enterprises in Contract Performance

(1) Article 17-B of New York State Executive Law acknowledges that Service-Disabled Veteran-Owned Businesses (SDVOBs) strongly contribute to the economies of the State and the nation. As defenders of our nation and in recognition of their economic activity in doing business in New York State, the Contractor for the Project and Work defined in this Agreement, agrees to, at no additional cost to the Fund, fully comply and cooperate with the Fund's implementation of New York State Executive Law Article 17-B and provide opportunities for SDVOBs in the fulfillment of the requirements of this Agreement. SDVOBs can be readily identified on the directory of certified businesses at <https://ogs.ny.gov/Veterans/#1>.

(2) The Contractor is strongly encouraged to the maximum extent practical and consistent with legal requirements of the State Finance Law and the Executive Law to use responsible and responsive SDVOBs in purchasing and utilizing commodities, services and technology that are of equal quality and functionality to those that may be obtained from non-SDVOBs. Furthermore, Contractors are reminded that they must continue to utilize small, minority and women-owned businesses consistent with current State law

(3) Utilizing SDVOBs in State contracts will help create more private sector jobs, rebuild New York

State's infrastructure, and maximize economic activity to the mutual benefit of the Contractor and its SDVOB partners. SDVOBs will promote the Contractor's optimal performance under the Agreement, thereby fully benefiting the public sector programs that are supported by associated public procurements.

(4) Public procurements can drive and improve the State's economic engine through promotion of the use of SDVOBs by the Manager. The Fund, therefore, expects Contractors to provide maximum assistance to SDVOBs in the performance of services for this Agreement. The potential participation by all kinds of SDVOBs will deliver great value to the State and its taxpayers.

(5) For the purposes of this Agreement, the Fund hereby establishes the goal of «SDVOB_goal»% participation for SDVOBs. For the purposes of providing meaningful participation by SDVOBs on the Agreement and achieving the Agreement Goal, the Contractor should reference the directory of New York State Certified SDVOBs at the following internet address: <https://ogs.ny.gov/Veterans/#1>

(6) Damages – SDVOB Participation: Any Contractor who willfully and intentionally fails to comply with the SDVOB participation requirements of the SDVOB regulations set forth in 9 NYCRR Section 252, and as set forth in this Agreement, shall be liable to the Fund for damages as otherwise specified in this agreement, and shall provide for other appropriate remedies on account of such breach. Damages shall be calculated based on the actual cost incurred by the Fund related to the Fund's expenses for personnel, supplies and overhead related to establishing, monitoring and reviewing certified SDVOB enterprise programmatic goals.

(7) The Contractor is required to submit a Compliance Report to the Fund in every application for payment or by request of the Fund and such report must document the progress made towards achievement of the SDVOB goal of the Agreement.

As such a Covered Contract, the State shall have no liability under this Agreement and this Agreement is not valid, effective or binding until it has been approved by the State Comptroller and filed in his or her office; provided however that if the State Comptroller does not approve or reject this Agreement within the time period specified in the MOU, then this Agreement shall be valid and enforceable without such approval.

Article X Requirement for Office of State Comptroller Review

In accordance with the Memorandum of Understanding (MOU) dated as of August 15, 2019 by and between the Governor, the Office of State Comptroller (State Comptroller), the Fund and other entities, it was agreed that certain Fund contracts (Covered Contracts) are subject to review by the State Comptroller.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

STATE UNIVERSITY CONSTRUCTION FUND

By _____
General Manager
Robert M. Haelen

By _____

Date: _____

SUCF Project No.

Contract No. T00XXXX

If Corporation, affix Corporate Seal

ACKNOWLEDGMENTS

(ACKNOWLEDGMENT BY INDIVIDUAL)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came
_____, to me known and known to me to be the
person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

Notary Public

(ACKNOWLEDGMENT BY PARTNERSHIP)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came
_____, to me known and known to me to be the
person who executed the above instrument, who, being duly sworn by me, did for himself depose and say that he is a
member of the firm of _____ consisting of himself and

that he executed the foregoing instrument in the firm name of _____

and that he had authority to sign same, and he did duly acknowledge to me that he executed the same as the act and deed

of said firm of _____, for the uses and purposes mentioned therein.

Notary Public

(ACKNOWLEDGEMENT BY CORPORATION)

STATE OF NEW YORK)
COUNTY OF) SS:

On this _____ day of _____, 20____, before me personally came
_____, to me known, who, being by me duly sworn, did depose
and say that he/she/they reside(s) in _____; that he/she/they is (are) the
_____ (president or other officer or director or attorney in fact duly appointed) of the
_____ (name of corporation), the corporation described in and which executed
the above instrument; and that he/she/they signed his/her/their name(s) thereto by authority of the board of directors of said
corporation.

Notary Public

Appendix “A”

Standard Clauses For New York State Contracts

The parties to the attached contract, license, lease, amendment or other agreement of any kind (hereinafter, "the contract" or "this contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party other than the State, whether a contractor, licensor, licensee, lessor, lessee or any other party; the word "State" herein refers to the State of New York and/or the State University Construction Fund "Fund"):

1. EXECUTORY CLAUSE. In accordance with Section 41 of the State Finance Law, the State shall have no liability under this contract to the Contractor or to anyone else beyond funds appropriated and available for this contract.

2. NON-ASSIGNMENT CLAUSE. In accordance with Section 138 of the State Finance Law, this contract may not be assigned by the Contractor or its right, title or interest therein assigned, transferred, conveyed, sublet or otherwise disposed of without the State's previous written consent, and attempts to do so are null and void. Notwithstanding the foregoing, such prior written consent of an assignment of a contract let pursuant to Article XI of the State Finance Law may be waived at the discretion of the Fund and with the concurrence of the State Comptroller where the original contract was subject to the State Comptroller's approval, where the assignment is due to a reorganization, merger or consolidation of the Contractor's business entity or enterprise. The State retains its right to approve an assignment and to require that any Contractor demonstrate its responsibility to do business with the State. The Contractor may, however, assign its right to receive payments without the State's prior written consent unless this contract concerns Certificates of Participation pursuant to Article 5-A of the State Finance Law.

3. COMPTROLLER'S APPROVAL. In accordance with the Memorandum of Understanding dated as of August 15, 2019 by and between the Governor, the Office of State Comptroller ("State Comptroller"), the Fund and other entities, providing for State Comptroller review of certain contracts, any such covered contracts shall not be valid, effective or binding upon the State until either such contract has been approved by the State Comptroller or the allowed time period has passed without State Comptroller approval or rejection and such contracts are filed in his or her office.

4. WORKERS' COMPENSATION BENEFITS. In accordance with Section 142 of the State Finance Law, this contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

5. NON-DISCRIMINATION REQUIREMENTS. To the extent required by Article 15 of the Executive Law (also known as the Human Rights Law) and all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment, nor subject any individual to harassment, because of age, race, creed, color, national origin, sexual orientation, gender identity or expression, military status, sex, disability, predisposing genetic characteristics, familial status, marital status, or domestic violence victim status or because the individual has opposed any practices forbidden under the Human Rights Law or has filed a complaint, testified, or assisted in any proceeding under the Human Rights Law. Furthermore, in accordance with Section 220-e of the Labor Law, if this is a contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 thereof, Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. Contractor is subject to fines of \$50.00 per person per day for any violation of Section 220-e or Section 239 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation.

6. WAGE AND HOURS PROVISIONS. If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 thereof, neither Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the Labor Law and as set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law. Additionally, effective April 28, 2008, if this is a public work contract covered by Article 8 of the Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with Subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to payment by the State of any State approved sums due and owing for work done upon the project.

7. NON-COLLUSIVE BIDDING CERTIFICATION. In accordance with Section 139-d of the State Finance Law, if this contract was awarded based upon the submission of bids, Contractor affirms, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. Contractor further affirms that, at the time Contractor submitted its bid, an authorized and responsible person executed and delivered to the State a non-collusive bidding certification on Contractor's behalf.

8. INTERNATIONAL BOYCOTT PROHIBITION. In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds \$5,000, the Contractor agrees, as a material condition of the contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 et seq.) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the State Comptroller within five (5) business days of such conviction, determination or disposition of appeal (2 NYCRR § 105.4).

9. SET-OFF RIGHTS. The State and the Fund shall have rights of set-off. These rights shall include, but not be limited to, the option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing to the State or the Fund with regard to this contract or any other Fund contract, as well as any other contract with any State department or agency, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the State or the Fund for any other reason including, without limitation, tax delinquencies, fee delinquencies or monetary penalties, adjustments, fees or claims for damages. The State and the Fund shall exercise its set-off rights in accordance with normal State practices including, in cases of set-off pursuant to an audit, the finalization of such audit by the State, the Fund its representatives, or the State Comptroller.

10. RECORDS. The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (hereinafter, collectively, the "Records"). The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter. The State Comptroller, the Attorney General and any other person or entity authorized to conduct an examination, as well as the Fund, shall have access to the Records during normal business hours at an office of the Contractor within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. The State shall take reasonable steps to protect from public disclosure any of the Records which are exempt from disclosure under Section 87 of the Public Officers Law (the "Statute") provided that: (i) the Contractor shall timely inform an appropriate State official, in writing, that said records should not be disclosed; and (ii) said records shall be sufficiently identified; and (iii) designation of said records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, the State's or the Fund's right to discovery in any pending or future litigation.

11. IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION. (a) Identification Number(s). Every invoice or New York State Claim for Payment submitted to the Fund by a payee, for payment for the sale of goods or services or for transactions (e.g., leases, easements, licenses, etc.) related to real or personal property must include the payee's identification number. The number is any or all of the

following: (i) the payee's Federal employer identification number, (ii) the payee's Federal social security number, and/or (iii) the payee's Vendor Identification Number assigned by the Statewide Financial System. Failure to include such number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or Claim for Payment, must give the reason or reasons why the payee does not have such number or numbers.

(b) Privacy Notification. (1) The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in Section 5 of the State Tax Law. Disclosure of this information by the seller or lessor to the State is mandatory. The principal purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their tax liabilities and to generally identify persons affected by the taxes administered by the Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law. (2) The personal information is requested by the Fund to purchase the goods or services or lease the real or personal property covered by this contract or lease. The information is maintained in the Statewide Financial System by the Vendor Management Unit within the Bureau of State Expenditures, Office of the State Comptroller, 110 State Street, Albany, New York 12236.

12. EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN. In accordance with Section 312 of the Executive Law and 5 NYCRR Part 143, if this contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of \$25,000.00, whereby a contracting agency is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the Fund; or (ii) a written agreement in excess of \$100,000.00 whereby the Fund is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of \$100,000.00 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project, then the following shall apply and by signing

this agreement the Contractor certifies and affirms that it is Contractor's equal employment opportunity policy that:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on State contracts and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. Affirmative action shall mean recruitment, employment, job assignment, promotion, upgradings, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation;

(b) at the request of the Fund, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein; and

(c) the Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the State contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

Contractor will include the provisions of "a," "b," and "c" above, in every subcontract over \$25,000.00 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State. The State shall consider compliance by a contractor or subcontractor with the requirements of any federal law concerning equal employment opportunity which effectuates the purpose of this clause. The Fund shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such federal law and if such duplication or conflict exists, the Fund shall waive the applicability of Section 312 to the extent of such duplication or conflict.

Contractor will comply with all duly promulgated and lawful rules and regulations of the Department of Economic Development's Division of Minority and Women's Business Development pertaining hereto.

13. CONFLICTING TERMS. In the event of a conflict between the terms of the contract (including any and all attachments thereto and amendments thereof) and the terms of this Schedule A, the terms of this Schedule A shall control.

14. GOVERNING LAW. This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

15. LATE PAYMENT. Timeliness of payment and any interest to be paid to Contractor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law. For the purposes of Article 11-A of the State Finance law, the Controller's Office of the State University Construction Fund, whose mailing address is the State University Plaza, 353 Broadway, Albany, New York 12246, is the Fund's designated payment office.

16. NO ARBITRATION. Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized), but must, instead, be heard in a court of competent jurisdiction of the State of New York.

17. SERVICE OF PROCESS. In addition to the methods of service allowed by the State Civil Practice Law & Rules ("CPLR"), Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Contractor's actual receipt of process or upon the Fund's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Contractor must promptly notify the Fund, in writing, of each and every change of address to which service of process can be made. Service by the Fund to the last known address shall be sufficient. Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

18. PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS. The Contractor certifies and warrants that all wood products to be used under this contract award will be in accordance with, but not limited to, the specifications and provisions of Section 165 of the State Finance Law, (Use of Tropical Hardwoods) which prohibits purchase and use of tropical hardwoods, unless specifically exempted, by

the State or any governmental agency or political subdivision or public benefit corporation. Qualification for an exemption under this law will be the responsibility of the contractor to establish to meet with the approval of the State.

In addition, when any portion of this contract involving the use of woods, whether supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in § 165 State Finance Law. Any such use must meet with the approval of the State; otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the State.

19. MACBRIDE FAIR EMPLOYMENT PRINCIPLES. In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992), the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in Section 165 of the New York State Finance Law), and shall permit independent monitoring of compliance with such principles.

20. OMNIBUS PROCUREMENT ACT OF 1992. It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority- and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business
Albany, New York 12245
Telephone: 518-292-5100
Fax: 518-292-5884
email: opa@esd.ny.gov

A directory of certified minority- and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business
Development
633 Third Avenue
New York, NY 10017
212-803-2414
email: mwbecertification@esd.ny.gov
<https://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp>

The Omnibus Procurement Act of 1992 (Chapter 844 of the Laws of 1992, codified in State Finance Law § 139-i and Public Authorities Law § 2879(3)(n)–(p)) requires that by signing this bid proposal or contract, as applicable, Contractors certify that whenever the total bid amount is greater than \$1 million:

(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority- and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to the State;

(b) The Contractor has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the State upon request; and

(d) The Contractor acknowledges notice that the State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

21. RECIPROCITY AND SANCTIONS PROVISIONS. Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act 1994 and 2000 amendments (Chapter 684 and Chapter 383,

respectively, codified in State Finance Law § 165(6) and Public Authorities Law § 2879(5))) require that they be denied contracts which they would otherwise obtain. NOTE: As of October 2019, the list of discriminatory jurisdictions subject to this provision includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii.

22. COMPLIANCE WITH BREACH NOTIFICATION AND DATA SECURITY LAWS. Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law § 899-aa and State Technology Law § 208) and commencing March 21, 2020 shall also comply with General Business Law § 899-bb.

23. COMPLIANCE WITH CONSULTANT DISCLOSURE LAW. If this is a contract for consulting services, defined for purposes of this requirement to include analysis, evaluation, research, training, data processing, computer programming, engineering, environmental, health, and mental health services, accounting, auditing, paralegal, legal or similar services, then, in accordance with Section 163 (4)(g) of the State Finance Law (as amended by Chapter 10 of the Laws of 2006), the Contractor shall timely, accurately and properly comply with the requirement to submit an annual employment report for the contract to the Fund, the Department of Civil Service and the State Comptroller.

24. PROCUREMENT LOBBYING. To the extent this agreement is a "procurement contract" as defined by State Finance Law §§ 139-j and 139-k, by signing this agreement the contractor certifies and affirms that all disclosures made in accordance with State Finance Law §§ 139-j and 139-k are complete, true and accurate. In the event such certification is found to be intentionally false or intentionally incomplete, the Fund may terminate the agreement by providing written notification to the Contractor in accordance with the terms of the agreement.

25. CERTIFICATION OF REGISTRATION TO COLLECT SALES AND COMPENSATING USE TAX BY CERTAIN STATE CONTRACTORS, AFFILIATES AND SUBCONTRACTORS.

To the extent this agreement is a contract as defined by Tax Law § 5-a, if the contractor fails to make the certification required by Tax Law § 5-a or if during the term of the contract, the Department of Taxation and Finance or the covered agency, as defined by Tax Law § 5-a, discovers that the certification, made under penalty of perjury, is false, then such failure to file or false certification shall be a material breach of this contract and this contract may be terminated, by

providing written notification to the Contractor in accordance with the terms of the agreement, if the covered agency determines that such action is in the best interest of the State.

26. IRAN DIVESTMENT ACT. By entering into this Agreement, Contractor certifies in accordance with State Finance Law § 165-a that it is not on the “Entities Determined to be Non-Responsive Bidders/Offerers pursuant to the New York State Iran Divestment Act of 2012” (“Prohibited Entities List”) posted at: <https://ogs.ny.gov/list-entities-determined-be-non-responsive-biddersofferers-pursuant-nys-iran-divestment-act-2012>

Contractor further certifies that it will not utilize on this Contract any subcontractor that is identified on the Prohibited Entities List. Contractor agrees that should it seek to renew or extend this Contract, it must provide the same certification at the time the Contract is renewed or extended. Contractor also agrees that any proposed Assignee of this Contract will be required to certify that it is not on the Prohibited Entities List before the contract assignment will be approved by the State Fund.

During the term of the Contract, should the Fund receive information that a person (as defined in State Finance Law § 165-a) is in violation of the above-referenced certifications, the Fund will review such information and offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment activity which is in violation of the Act within 90 days after the determination of such violation, then the Fund shall take such action as may be appropriate and provided for by law, rule, or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

27. ADMISSIBILITY OF REPRODUCTION OF CONTRACT. Notwithstanding the best evidence rule or any other legal principle or rule of evidence to the contrary, the Contractor acknowledges and agrees that it waives any and all objections to the admissibility into evidence at any court proceeding or to the use at any examination before trial of an electronic reproduction of this contract, in the form approved by the State Comptroller, if such approval was required, regardless of whether the original of said contract is in existence.

SCHEDULE I Unit Prices

Refer to Section 4.04 of the Agreement for additional information.

<u>Work or Material Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
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SCHEDULE II Allowance(s)

Refer to Section 4.05 of the Agreement for additional information. The amount(s) indicated below shall be included in the Total Bid amount and their total indicated on the Proposal in the space provided.

<u>Work or Material Description</u>	<u>Amount in Words</u>	<u>Amount in Figures</u>
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SCHEDULE III Field Order Allowance

Refer to Section 4.05A of the Agreement for additional information. The amount indicated below shall be included in the Total Bid amount and indicated on the Proposal in the space provided.

(in words)

(in figures)

PROJECT No. 081047-00

Contractor Job #:

Project Name: SUNY New Paltz - Roof Replacement - Smiley Arts Building, College Theatre, Dorsky Museum and Faculty Office Building
Revised By:
DATE:

Status Key: **NYS** - Not Yet Submitted **SCH** Scheduled for submission **SUB** - Submitted & Received **APP**-Approved No Exceptions Taken **MCN**- Make Corrections Noted **R&R**- Revise & Resubmit **REJ**- Rejected **SSI**- Submit Specified Item **RFR** - Resubmit for Record Only
Submittal Type Key: **SD** - Shop Drawing **DAT** - Project / Product Data **SAM** - Sample **CAL** - Calculations **TEST** - Test report **WAR** - Warranty **CERT** - Certification **QC** - Quality Control / Qualifications submittal **EXT** Extra Stock / tool **OMM** - Operations Maintenance Manual **REP** Report **OTH** - descr in comments

For Bidding, Printing columns to the left of "Description / Subject of Submittal" is optional

Line No	Contractor ID No.	CSI Section No.	Paragraph No.	Revision / Version No. (if appl.)	Description / subject of Submittal	Submittal Action Category	Submittal Type	Status	Firm preparing Submittal	Firm Reviewing Submittal	Proposed Submission Date	Actual Submission Date	Requested Approval Date	Actual Approval Date	Date Submission Returned	Purchasing Date	Fabrication Date	Installation Date	1st Delivery Inspected Date	Pre Install. Conf. Date	Mock up inspected Date	Other (desc.)	Comments
1		00 52 00	Section 2.18		List of Subcontractors	Action	DAT	NYS															Due prior to work and not later than 30 days after NTP
2		00 52 00	Section 2.12		Site Conditions	Informational	REP	NYS															if needed
3		00 52 00	A-Sec 2.24-1		Record Drawings	Informational	OTH	NYS															
4		00 52 00	A-Sec 3.06		Monthly Reports	Informational	REP	NYS															
5		00 52 00	A-Sec 4.08		Schedule of Values	Action	OTH	NYS															
6		00 52 00	A-Sec 6.07-1		MBE/WBE Monthly Utilization Reports	Informational	REP	NYS															
7		00 52 00	A-Sec 2.06		Superintendent Submission	Action	OTH	NYS															
8		01 18 13			Utility Shutdown Schedule	Action	OTH	NYS															
9		01 26 13			Request for Information (RFI) log	Action	OTH	NYS															
10		01 29 00 10			Meter readings	Informational	DAT	NYS															monthly
11		01 31 19			bi-weekly reports	Informational	REP	NYS															
12		01 31 19 10			Existing Conditions reports	Informational	REP	NYS															if needed
13		01 31 19 10			Existing Conditions report	Informational	REP	NYS															
14		01 32 13			Off campus street access	Informational	REP	NYS															if needed
15		01 32 13			off campus street usage	Informational	OTH	NYS															
16		01 32 16			Project Schedule and Submittal Schedule	Action	OTH	NYS															
17		01 32 33			Project Photographs	Informational	REP	NYS															Due prior to work
18		01 33 23			Submittal management website	Action	OTH	NYS															if needed
19		01 33 23			Archival submittals	Informational	OTH	NYS															if needed
20		01 33 23 10			Coordination Drawings	Action	SD	NYS															Due prior to work
21		01 35 13			emergency action plan	Informational	DAT	NYS															
22		01 35 13			daily reports	Informational	REP	NYS															Due before waste leaves site
23		01 35 13			SWPPP modifications	Informational	DAT	NYS															
24		01 35 13			SWPPP inspection logs	Informational	DAT	NYS															
25		01 35 13			Diesel vehicle forms	Informational	DAT	NYS															if needed
26		01 35 13			Temporary Traffic Control plans	Action	SD	NYS															
27		01 35 13			ID Badge Format	Informational	OTH	NYS															
28		01 35 13			daily manpower counts	Informational	REP	NYS															
29		01 35 23			Safety Procedures Manual	Informational	DAT	NYS															
30		01 35 23			Names of "competent" persons	Informational	DAT	NYS															
31		01 35 23			Pre-Demolition utility plan	Informational	SD	NYS															
32		01 35 23			Temporary Egress / Barrier Plan	Informational	OTH	NYS															
33		01 35 23 10			MSDS sheets	Informational	DAT	NYS															if needed
34		01 41 13			Special Inspection submissions	Action	TEST	NYS															
35		01 41 13			Fire Alarm System License	Informational	OTH	NYS															
36		01 41 13			Master Electrical Inspector	Informational	OTH	NYS															
37		01 41 13			Code test and inspection forms	Action	REP	NYS															
38		01 41 13			Name of Commissioning contact	Action	REP	NYS															
39		01 51 16			Fire watch plan	Action	REP	NYS															
40		01 51 23			Cooling tower maintenance plan	Action	REP	NYS															
41		01 52 13			Field Office equipment information	Action	REP	NYS															
42		01 54 13			Plan for Use of Elevator(s) for Construction	Action	REP	NYS															
43		01 55 29			lifting procedure safety plan	Informational	DAT	NYS															if needed
44		01 55 29			Petroleum Spill Compliance Certification	Informational	OTH	NYS															
45		01 60 00 20			Vermiculite origins certification	Informational	OTH	NYS															
46		01 64 00			Campus-Furnished Products submittals	Action	SD	NYS															if needed
47		01 66 00			Preventive maintenance log	Action	REP	NYS															
48		01 71 23			Field Engineering surveys	Informational	DAT	NYS															
49		01 73 00 10			Information for Rebates/Grants/Awards/Programs	Informational	DAT	NYS															
50		01 74 00			Fluid system flushing and Clean Up plan	Informational	DAT	NYS															
51		01 74 00			Final Cleanup Plan	Informational	DAT	NYS															
52		01 74 16			Planting Maintenance logs	Informational	DAT	NYS															
53		01 74 19			Construction Waste Management Plan	Action	OTH	NYS															
54		01 74 19			Construction Waste manifests/monthly reports	Action	OTH	NYS															
55		01 78 23			Operating Instructions and Manuals	Action	OTH	NYS															
56		01 78 36			Warranties	Action	OTH	NYS															
57		01 79 00			Schedule of Campus training	Action	OTH	NYS															
58		01 79 00			Outlines of actual training	Action	OTH	NYS															
59		Consultant adds submittals listed in Technical specs after the above																					
60		Consultant should also adjust print area to only include rows with text																					
61		02 07 00	1.03.A		Schedule	Action	OTH	NYS															
62			1.03.B		Details and procedures for dust and noise control	Action	OTH	NYS															
63			1.03.C		Quality Control Submittals	Informational	QC	NYS															
64		02 82 13																					
65		03 73 35	1.04.A		Product Data	Action	DAT	NYS															
66			1.04.B.1.a		Furnish manufacturer's certification that materials meet or exceed Specification requirements.	Action	CERT	NYS															
67			1.04.B.1.b		Manufacturer's training certificate	Action	CERT	NYS															
68			1.04.B.2		Repair Procedure	Action	SD	NYS															
69			1.04.B.3		Manufacturer's Field Reports	Informational	QC	NYS															
70			1.04.B.4		Contractor Qualifications	Informational	QC	NYS															
71			1.04.B.5		Mock-up	Action	SAM	NYS															
72		05 50 00	1.05.A.1		Submit product data sheets for products used in metal fabrications	Action	DAT	NYS															
73			1.05.A.2		Submit product data sheets for painting materials.	Action	DAT	NYS															
74			1.05.A.3		Submit product data sheets for grouts and sealants.	Action	DAT	NYS															
75			1.05.B		Shop Drawings	Action	SD	NYS															

PROJECT No. 081047-00

Contractor Job #:

Project Name: SUNY New Paltz - Roof Replacement - Smiley Arts Building, College Theatre, Dorsky Museum and Faculty Office Building
Revised By:
DATE:

Status Key: **NYS** - Not Yet Submitted **SCH** Scheduled for submission **SUB** - Submitted & Recieved **APP**-Approved No Exceptions Taken **MCN**- Make Corrections Noted **R&R**- Revise & Resubmit **REJ**- Rejected **SSI**- Submit Specified Item **RFR** - Resubmit for Record Only
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Line No.	Contractor ID No.	CSI Section No.	Paragraph No.	Revision / Version No. (if appl.)	Description / subject of Submittal	Submittal Action Category	Submittal Type	Status	Firm preparing Submittal	Firm Reviewing Submittal	Proposed Submission Date	Actual Submission Date	Requested Approval Date	Actual Approval Date	Date Submission Returned	Purchasing Date	Fabrication Date	Installation Date	1st Delivery Inspected Date	Pre Install. Conf. Date	Mock up inspected Date	Other (desc.)	Comments
76			1.05.C		Calculations	Informational	CAL	NYS															
77			1.05.D		Samples	Informational	SAM	NYS															
78			1.05.E		Welder certificates	Informational	CERT	NYS															
79			1.05.F		Qualification data	Informational	QC	NYS															
80			1.05.G		Test Reports	Informational	TEST	NYS															
81			1.05.H		Warranty	Informational	WAR	NYS															
82		06 61 00	1.03.A		Quality Control Submittals	Informational	QC	NYS															
83		07 46 40	1.05.B		Product Data	Action	DAT	NYS															
84			1.05.C		Samples	Action	SAM	NYS															
85			1.05.D		Verification Samples	Action	SAM	NYS															
86			1.05.E		Manufacturer's Certification	Informational	CERT	NYS															
87			1.06.A		Installer Qualifications	Informational	CERT	NYS															
88			1.06.B		Mock-up	Action	SAM	NYS															
89		07 54 23a	1.4.A		Product Data	Action	DAT	NYS															
90			1.4.B		Shop Drawings	Action	SD	NYS															
91			1.4.C.1		Samples of sheet roofing	Action	SAM	NYS															
92			1.4.C.2		Samples of walkway pads or rolls	Action	SAM	NYS															
93			1.4.C.3		Samples of metal termination bars	Action	SAM	NYS															
94			1.4.D		Wind uplift resistance submittal	Action	OTH	NYS															
95			1.5.A		Contractor's product certificate	Informational	CERT	NYS															
96			1.5.B		Qualification Data: For Installer, Manufacturer and Roofing Inspector.	Informational	QC	NYS															
97			1.5.C		Manufacturer Certificates	Informational	CERT	NYS															
98			1.5.D		Product Test Reports	Informational	TEST	NYS															
99			1.5.E		Warranties: Unexecuted sample copies of special warranties.	Informational	WAR	NYS															
100			1.5.F		Inspection Reports	Informational	REP	NYS															
101			1.6.A		Executed copies of warranties	Closeout	REP	NYS															
102		07 54 23b	1.4.A		Product Data	Action	DAT	NYS															
103			1.4.B		Shop Drawings	Action	SD	NYS															
104			1.4.C.1		Samples of sheet roofing	Action	SAM	NYS															
105			1.4.C.2		Samples of walkway pads or rolls	Action	SAM	NYS															
106			1.4.C.3		Samples of metal termination bars	Action	SAM	NYS															
107			1.4.D		Wind uplift resistance submittal	Action	OTH	NYS															
108			1.5.A		Contractor's product certificate	Informational	CERT	NYS															
109			1.5.B		Qualification Data: For Installer, Manufacturer and Roofing Inspector.	Informational	QC	NYS															
110			1.5.C		Manufacturer Certificates	Informational	CERT	NYS															
111			1.5.D		Product Test Reports	Informational	TEST	NYS															
112			1.5.E		Warranties: Unexecuted sample copies of special warranties.	Informational	WAR	NYS															
113			1.5.F		Inspection Reports	Informational	REP	NYS															
114			1.6.A		Executed copies of warranties	Closeout	REP	NYS															
115		07 54 23c	1.4.A		Product Data	Action	DAT	NYS															
116			1.4.B		Shop Drawings	Action	SD	NYS															
117			1.4.C.1		Samples of sheet roofing	Action	SAM	NYS															
118			1.4.C.2		Samples of walkway pads or rolls	Action	SAM	NYS															
119			1.4.C.3		Samples of metal termination bars	Action	SAM	NYS															
120			1.4.D		Wind uplift resistance submittal	Action	OTH	NYS															
121			1.5.A		Contractor's product certificate	Informational	CERT	NYS															
122			1.5.B		Qualification Data: For Installer, Manufacturer and Roofing Inspector.	Informational	QC	NYS															
123			1.5.C		Manufacturer Certificates	Informational	CERT	NYS															
124			1.5.D		Product Test Reports	Informational	TEST	NYS															
125			1.5.E		Warranties: Unexecuted sample copies of special warranties.	Informational	WAR	NYS															
126			1.5.F		Inspection Reports	Informational	REP	NYS															
127			1.6.A		Executed copies of warranties	Closeout	REP	NYS															
128		07 54 23d	1.4.A		Product Data	Action	DAT	NYS															
129			1.4.B		Shop Drawings	Action	SD	NYS															
130			1.4.C.1		Samples of sheet roofing	Action	SAM	NYS															
131			1.4.C.2		Samples of walkway pads or rolls	Action	SAM	NYS															
132			1.4.C.3		Samples of metal termination bars	Action	SAM	NYS															
133			1.4.D		Wind uplift resistance submittal	Action	OTH	NYS															
134			1.5.A		Contractor's product certificate	Informational	CERT	NYS															
135			1.5.B		Qualification Data: For Installer, Manufacturer and Roofing Inspector.	Informational	QC	NYS															
136			1.5.C		Manufacturer Certificates	Informational	CERT	NYS															
137			1.5.D		Product Test Reports	Informational	TEST	NYS															
138			1.5.E		Warranties: Unexecuted sample copies of special warranties.	Informational	WAR	NYS															
139			1.5.F		Inspection Reports	Informational	REP	NYS															
140			1.6.A		Executed copies of warranties	Closeout	REP	NYS															
141		07 60 00	1.03.A		Shop Drawings	Action	SD	NYS															
142			1.03.B		Product Data	Action	DAT	NYS															
143			1.03.C		Samples	Action	SAM	NYS															
144			1.03.D		Guarantee	Informational	WAR	NYS															
145			1.03.E		Certificates of Qualifications	Informational	CERT	NYS															
146			1.03.F		Product Certificates	Informational	CERT	NYS															
147		07 61 00	1.03.A		Shop Drawings	Action	SD	NYS															
148			1.03.B		Product Data	Action	DAT	NYS															
149			1.03.C		Samples	Action	SAM	NYS															
150			1.03.D		Statement of Application	Informational	OTH	NYS															
151			1.03.E		Installer Certifications	Informational	CERT	NYS															
152			1.07.A		Warranty	Informational	WAR	NYS															
153		07 72 00	1.03.A		Shop Drawings	Action	SD	NYS															
154			1.03.B		Product Data	Action	DAT	NYS															
155			1.03.C		Contract Closeout Submittals	Action	OMM	NYS															
156			1.03.D		Warranty	Informational	WAR	NYS															
157		07 90 00	1.03.A		Product Data	Action	DAT	NYS															

PROJECT No. 081047-00

Contractor Job #:

Project Name: SUNY New Paltz - Roof Replacement - Smiley Arts Building, College Theatre, Dorsky Museum and Faculty Office Building
Revised By:
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158			1.03.B		Samples for Initial Selection	Action	SAM	NYS															
159			1.03.C		Samples for Verification	Action	SAM	NYS															
160			1.03.D.1		Product Certificates	Action	CERT	NYS															
161			1.03.D.2		Installer Qualifications	Informational	QC	NYS															
162			1.03.D.3		Company Field Advisor Data	Informational	OTH	NYS															
163			1.03.D.4		Preconstruction test results	Informational	TEST	NYS															
164			1.03.E		Mock-ups	Action	SAM	NYS															
165		08 11 00	1.03.A		Product Data	Action	DAT	NYS															
166			1.03.B		Shop Drawings	Action	SD	NYS															
167			1.03.C		Samples	Action	SAM	NYS															
168			1.03.D		Quality Control Submittals	Informational	QC	NYS															
169			1.03.E		Warranties	Informational	WAR	NYS															
170		08 62 10	1.04.A		Product Data	Action	DAT	NYS															
171			1.04.B		Shop Drawings	Action	SD	NYS															
172			1.04.C		Samples	Action	SAM	NYS															
173			1.04.D		Test Reports	Informational	TEST	NYS															
174			1.04.E		Design Requirements	Informational	CERT	NYS															
175			1.04.F		Warranties	Informational	WAR	NYS															
176		08 63 00	1.03.A		Product Data	Action	DAT	NYS															
177			1.03.B		Samples	Action	SAM	NYS															
178			1.05		Warranties	Informational	WAR	NYS															
179		08 71 00	1.03.A		Product Data	Action	DAT	NYS															
180			1.03.B		Samples	Action	SAM	NYS															
181			1.03.C		Hardware Schedule	Action	OTH	NYS															
182			1.03.D		Templates	Informational	OTH	NYS															
183			1.03.E		Key Schedule	Informational	OTH	NYS															
184			1.03.F		Deliver Keys	Action	OTH	NYS															
185			1.03.G		Warranties	Informational	WAR	NYS															
186		08 73 00	1.03.A		Product Data	Action	DAT	NYS															
187			1.03.B		Samples	Action	SAM	NYS															
188		08 80 00	1.03.A		Product Data	Action	DAT	NYS															
189			1.03.B		Samples	Action	SAM	NYS															
190			1.03.C		Quality Assurance	Informational	OTH	NYS															
191			1.03.D		Warranties	Informational	WAR	NYS															
192		22 05 00			N/A																		
193		22 05 29			Pipe Support Submittal	Action	DAT	NYS															
194		22 10 00			Pipe & Fitting Submittal	Action	DAT	NYS															
195		22 13 19			Roof Drain & Vent Cap Submittal	Action	DAT	NYS															
196		23 01 16			Demolition Procedure	Informational	OTH	NYS															
197		23 05 00			Brochure/Shop Drawings of equipment and materials	Action	SD	NYS															
198		23 05 29			Brackets and Hangers submittal	Action	DAT	NYS															
199		23 05 40			Vibration Isolation Submittal	Action	DAT	NYS															
200		23 05 53			Mechanical Identification Product Submittal	Action	DAT	NYS															
201		23 05 93			Existing Field Equipment Testing Report	Action	TEST	NYS															
202		23 05 93			New Field Equipment Testing Report	Action	TEST	NYS															
203		23 05 93			Testing, adjusting and balancing Report	Action	TEST	NYS															
204		23 07 13			Product Data	Action	DAT	NYS															
205		23 09 00			Product Data for system component and softward module	Action	DAT	NYS															
206		23 09 00			System Shop Drawings	Action	SD	NYS															
207		23 09 00			Project Record Documents	Action	DAT	NYS															
208		23 09 00			Checkout and startup checklists	Action	OTH	NYS															
209		23 09 30			Coordination Drawings	Action	SD	NYS															
210		23 09 93			Sequences and system drawings	Action	SD	NYS															
211		23 31 00			Duct materials and Product Data	Action	DAT	NYS															
212		23 31 00			Ductwork fabrication/Sheet Metal drawings	Action	SD	NYS															
213		23 31 00			Duct Test Reports	Action	REP	NYS															
214		23 31 00			Project Record Documents	Action	SD	NYS															
215		23 31 00			Duct Frabrication Standard and method of installation	Action	DAT	NYS															
216		23 39 00			Fan Performance Data	Action	DAT	NYS															
217		23 39 00			Fan Shop Drawings	Action	SD	NYS															
218		23 74 05			Unit Product Submittal	Action	DAT	NYS															
219		23 74 05			Components drawings	Action	SD	NYS															
220		23 74 05			Manufacturer's Installation Instructions	Action	DAT	NYS															
221		23 74 05			Unit operation and maintenance data	Action	OMM	NYS															
222		26 28 16			Product Data	Action	DAT	NYS															
223		26 05 00			Product Data	Action	DAT	NYS															
224		26 05 19			Product Data	Action	DAT	NYS															
225		26 05 19			Field Quality Control Test Reports	Action	REP	NYS															
226		26 05 26			Product Data	Action	DAT	NYS															
227		26 05 26			Field Quality Control Test Reports	Action	REP	NYS															
228		26 05 29			Product Data	Action	DAT	NYS															
229		26 05 33			Product Data	Action	DAT	NYS															
230		26 05 33			Shop Drawings	Action	SD	NYS															
231		26 05 53			Product Data	Action	DAT	NYS															
232		26 27 26			Product Data	Action	DAT	NYS															
233		26 27 26			Product Data	Action	DAT	NYS															
234		26 27 26			Operation and Maintenance Data	Action	OMM	NYS															

Statement of Special Inspections

SUCF Project No: 081047-00

Project Title: SUNY New Paltz - Roof Replacement

Registered Design Professionals in Responsible Charge:

Architect: (Name) (Address)
MDSzerbaty & Associates Architecture
307 Seventh Avenue, 1501, New York, NY 10001

Structural Engineer: _____

Mechanical Engineer: IAQ Systems Inc.
555 Eighth Avenue, Suite 1502, New York, NY 10018

- ✓ Identification of Seismic-Force Resisting Systems and Wind-Force-Resisting Systems
- ✓ Required Special Inspections and Frequencies
- ✓ Special Inspector Minimum Qualifications
- ✓ Contractor's Statement of Responsibility Form
- ✓ Fabricator's Certificate of Compliance Form *(only needed if there are fabricated items)*
- ✓ Special Inspector / Approved Agency Final Report

As the Registered Design Professional(s) in Responsible Charge for this project, I/we certify this Statement of Special Inspections includes a complete list of materials and work that require special inspection and testing and the minimum qualifications of the Special Inspectors / testing agencies required to be considered for conducting the inspections and testing. This represents the complete extent of special inspections and testing required during the construction of this project and complies with the NYS 2020 Uniform Fire Prevention and Building Code.

In addition to the inspections required in 2020 BCNYS sections 105 and 1705, I/we shall perform structural observations as necessary per 1704.6.

(Affix professional seal)

(Affix professional seal)

(Affix professional seal)

Arch.: _____ Str. Eng.: _____ Mech. Eng.: _____
(Print name / date) (Print name / date) (Print name / date)

(Signature)

(Signature)

(Signature)

➤ **Nature of Occupancy:** B Risk Category II

➤ **Seismic-Force-Resisting Systems:**

The Seismic Design Category (SDC) is _

There ☐are ☒are not, seismic-force-resisting systems in this project.

There ☐are ☒are not, designated seismic systems.

Additional Items for Seismic Design Categories B, C, D or F (1705.12.8):

☐ Isolator units and energy dissipation devices.

Additional Items for Seismic Design Categories C, D, E or F:

☐ HVAC ducts designed to carry hazardous materials. (1705.12.6)

☐ Piping / mechanical units designed to carry hazardous materials. (1705.12.6)

☐ Electrical equipment used for emergency or standby power systems. (1705.12.6)

☐ Vibration isolation systems requiring 1/4" max between equipment support frames and restraint. (1705.12.6)

☐ Automatic fire sprinkler installed: mechanical and electrical equipment, including ductwork, piping systems and their structural supports. (1705.12.6)

☐ Structural wood (1705.12.2)

☐ Cold-formed light-frame construction (1705.12.3)

☐ Designated seismic systems (1705.12.4)

Additional items for Seismic Design Categories D, E or F:

☐ Exterior cladding, interior or exterior non-bearing walls >30 ft above grade or walking surfaces. (1705.12.5)

☐ Exterior cladding, interior or exterior non-bearing walls weighing >5 psf. (1705.12.5)

☐ Interior non-bearing walls weighing >15 psf. (1705.12.5)

☐ Access floors. (1705.12.5)

☐ Steel storage racks taller than 8 feet. (1705.12.7)

☐ Cold-formed steel special bolted moment frames. (1705.12.9)

Additional items for Seismic Design Categories E or F:

☐ Electrical equipment. (1705.12.6)

➤ **Wind-Force-Resisting Systems:**

☒ Wind Exposure Category B, wind speed minimum 120 MPH.

☐ Wind Exposure Category C or D, wind speed minimum 110 MPH.

Design Wind Speed MPH

☐ Special Wind Region

☐ Windborne Debris Region (1609.2)

Design includes wind-force-resisting systems and components:

☐ Structural wood (1705.11.1)

☐ Cold-formed steel light-frame construction (1705.11.2)

☒ Roof covering, roof deck and roof framing connections. (1705.11.3)

☐ Exterior wall covering and wall connections to roof and floor diaphragms and framing. (1705.11.3)

Required Special Inspections, Tests, Frequencies

<input type="checkbox"/>	STEEL CONSTRUCTION: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Minimum inspections prior to welding.	X		AISC 360 Table N5.4-1	1705.2.1
<input type="checkbox"/>	Minimum inspections during welding.	X		AISC 360 Table N5.4-2	
<input type="checkbox"/>	Minimum inspections after welding.		X	AISC 360 Table N5.4-3	
<input type="checkbox"/>	UT shall be performed on CJP groove welds subject to transversely applied tension loading in butt, T-, and Corner joints. a. For Risk Category III or IV structures b. For Risk Category II structures		X 100% X 10%	AISC 360 N5.5b	
<input type="checkbox"/>	Minimum inspections prior to high-strength bolting (except for snug-tight joints).	X		AISC 360 Table N5.6-1	
<input type="checkbox"/>	Minimum inspections during high-strength bolting (except for snug-tight joints). For pretension/slip-critical joints: a. Turn-of-nut with match marking, direct-tension-indicator method, twist-off-type tension control bolt method. b. Calibrated wrench method, turn-of-nut method without matchmaking.	X	X	AISC 360 Table N5.6-2	
<input type="checkbox"/>	Minimum inspections after high-strength bolting.		X	AISC 360 Table N5.6-3	
<input type="checkbox"/>	Inspect fabricated or erected steel as appropriate to verify compliance with the construction drawings. Inspect braces, stiffeners, member locations, and joint details.		X	AISC 360 N5.7	
<input type="checkbox"/>	Inspect during placement of anchor rods and other embedments supporting structural steel for compliance with the construction dwgs.	X		AISC 360 N5.7	
<input type="checkbox"/>	Inspect welding of steel headed stud anchors.	X		AISC 360 N6 AWS D1.1/D1.1M	
<input type="checkbox"/>	Verification for metal deck: a. Welding consumables, welding procedure specs, welder's qualifications prior to work, observation of work in progress, and visual inspection of all welds. b. Fasteners to be used prior to work, observation of work in progress to confirm conformance to manufacturer's recommendations, and visual inspection of completed installation.	X X		AISC 360 N6	

<input type="checkbox"/>	COLD-FORMED STEEL DECK: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Inspection or Execution Tasks Prior to Deck Placement		X	SDI QA/QC Table 1.1	1705.2.2
<input type="checkbox"/>	Inspection or Execution Tasks After to Deck Placement		X	SDI QA/QC Table 1.2	
<input type="checkbox"/>	Inspection or Execution Tasks Prior to Welding		X	SDI QA/QC Table 1.3	
<input type="checkbox"/>	Inspection or Execution Tasks During Welding	X		SDI QA/QC Table 1.4	
<input type="checkbox"/>	Inspection or Execution Tasks After to Welding		X	SDI QA/QC Table 1.5	
<input type="checkbox"/>	Inspection or Execution Tasks Prior to Mechanical Fastening		X	SDI QA/QC Table 1.6	
<input type="checkbox"/>	Inspection or Execution Tasks During to Mechanical Fastening	X		SDI QA/QC Table 1.7	
<input type="checkbox"/>	Inspection or Execution Tasks After to Mechanical Fastening		X	SDI QA/QC Table 1.8	

<input type="checkbox"/>	OPEN-WEB STEEL JOISTS AND /OR JOIST GIRDERS: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
	Installation of open-web steel joists and joist girders.				Table 1705.2.3
<input type="checkbox"/>	End connections – welding or bolted	-	X	SJI CJ,SJI K SJI LH/DLH OR SJI JG	
<input type="checkbox"/>	Bridging – horizontal or diagonal a. Standard bridging b. Bridging that differs from the SJI specifications.	-	X	SJI CJ,SJI K SJI LH/DLH OR SJI JG	

<input type="checkbox"/>	COLD-FORMED STEEL TRUSSES SPANNING 60 FT OR GREATER: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify the temporary installation of restraint / bracing is installed per the approved truss submittal package.		X		1705.2.4
<input type="checkbox"/>	Verify the permanent individual truss member restraint / racing is installed per the approved truss submittal package.		X		

<input type="checkbox"/>	CONCRETE CONSTRUCTION: Special Inspection and Testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Inspect reinforcement, including restressing tendons, and verify placement.	-	X	ACI 318 Ch. 20, 25.2, 25.3, 26.5.1- 26.5.3	1908.4
<input type="checkbox"/>	Reinforcing bar welding: a. Verify weldability of reinforcing bars other than ASTM A706; b. Inspect single-pass fillet welds, maximum 5/16"; and c. Inspect all other welds	X	X X	AWS D1.4 ACI 318:26.5.4	
<input type="checkbox"/>	Inspect anchors cast in concrete.	-	X	ACI 318:17.8.2	-
<input type="checkbox"/>	Inspect anchors post-installed in hardened concrete members. a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical and adhesive anchors not defined in 4.a.	X	X	ACI 318: 7.8.2.4 ACI 318: 17.8.2	Table 1705.3 footnote 'b'.
<input type="checkbox"/>	Verify use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
<input type="checkbox"/>	Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C172 ASTM C31 ACI 318: 26.4.5,26.12	1908.10
<input type="checkbox"/>	Inspect concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.4.5	1908.6, .7, and .8
<input type="checkbox"/>	Verify maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.4.7- 26.4.9	1908.9
<input type="checkbox"/>	Inspect pre-stressed concrete for: a. Application of pre-stressing forces; and b. Grouting of bonded pre-stressing tendons	X X	- -	ACI 318: 6.9.2.1 ACI 318: 6.9.2.3	
<input type="checkbox"/>	Inspect erection of precast concrete members.	-	X	ACI 318: 6.8	-
<input type="checkbox"/>	Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.10.2	-
<input type="checkbox"/>	Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.10.1(b)	-

<input type="checkbox"/>	MASONRY CONSTRUCTION: Level A – For Risk Category I, II, or III, designed using Prescriptive or Empirical design methods. Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify certificates of compliance prior to construction.		X	TMS 402, TMS 602 Table 3.1.1	1705.4

<input type="checkbox"/>	MASONRY CONSTRUCTION: Level B – For Risk Category I, II, or III, designed using Engineered design methods, or Risk Category IV designed using Prescriptive design methods. Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Specification Article 1.5 B.1.b.3 for self-consolidating grout.	X	X	TMS 402 Table 3.1.2	1705.4
<input type="checkbox"/>	Verification of f'_m and f'_{AAC} in accordance with Specification Article 1.4B prior to construction, except where specifically exempted by TMS 402.		X	TMS 402 Table 3.1.2	
<input type="checkbox"/>	Verify compliance with the approved submittals.		X	TMS 602 Art 1.5	
<input type="checkbox"/>	As masonry construction begins, verify the following are in compliance:				
<input type="checkbox"/>	Proportions of site-prepared mortar		X	TMS 602 Art 2.1, 2.6A	
<input type="checkbox"/>	Construction of mortar joints		X	TMS 602 Art 3.3B	
<input type="checkbox"/>	Grade and size of prestressing tendons and anchorages		X	TMS 602 Art 2.4B, 2.4H	
<input type="checkbox"/>	Location of reinforcement, connectors and prestressing tendons and anchorages		X	TMS 602 Art 3.4, 3.6A	
<input type="checkbox"/>	Prestressing technique		X	TMS 602 Art 3.6B	
<input type="checkbox"/>	Properties of thin-set mortar for AAC masonry	X	X	TMS 602 Art 2.1C	
<input type="checkbox"/>	Prior to grouting, verify that the following are in compliance:				
<input type="checkbox"/>	Grout space		X	TMS 602 Art 3.2D, 3.2F	
<input type="checkbox"/>	Grade, type and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		X	TMS 402 Sec 6.1 TMS 602 Art 2.4, 3.4	
<input type="checkbox"/>	Placement of reinforcements, connectors and prestressing tendons and anchorages		X	TMS 402 Sec 6.1, 6.2.1, 6.2.6, 6.2.7 TMS 602 Art 3.2E, 3.4, 3.6A	
<input type="checkbox"/>	Proportions of site-prepared grout and prestressing grout for bonded tendon		X	TMS 602 Art 2.6B, 2.4G.1.b	
<input type="checkbox"/>	Construction of mortar joints.		X	TMS 602 Art 3.3B	

<input type="checkbox"/>	MASONRY CONSTRUCTION: Level C – For Risk Category IV designed using Engineered design methods. Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verification of f'_m and f'_{AAC} in accordance with Specification Article 1.4B prior to construction and for every 5,000 sq. ft. during construction.	X	X	TMS 402 Table 3.1.3	1705.4
<input type="checkbox"/>	Verification of proportions of materials in premixed or preblended mortar prestressing grout, and grout other than self-consolidating grout, as delivered to the project site.	X	X	TMS 402 Table 3.1.3	
<input type="checkbox"/>	Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Specification Article 1.5 B.1.b.3 for self-consolidating grout.	X	X	TMS 402 Table 3.1.3	
<input type="checkbox"/>	Verify compliance with the approved submittals.		X	TMS 602 Art 1.5	
<input type="checkbox"/>	Verify that the following are in compliance:				
<input type="checkbox"/>	Proportions of site-mixed mortar, grout and prestressing grout for bonded tendons.		X	TMS 602 Art 2.1, 2.6A, 2.6B, 2.6C, 2.4G.1.b	
<input type="checkbox"/>	Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		X	TMS 402 Sec 6.1, TMS 602 Art 2.4, 3.4	
<input type="checkbox"/>	Placement of masonry units and construction of mortar joints.		X	TMS 602 Art 3.3B	
<input type="checkbox"/>	Placement of reinforcement, connectors and prestressing tendons and anchorages	X		TMS 402 Sec 6.1, 6.2.1, 6.2.6, 6.2.7 TMS 602 Art 3.2E, 3.4, 3.6A	
<input type="checkbox"/>	Grout space prior to grouting	X		TMS 602 Art 3.2D, 3.2F	
<input type="checkbox"/>	Placement of grout and prestressing grout for bonding tendons.	X		TMS 602 Art 3.5, 3.6C	
<input type="checkbox"/>	Size and location of structural elements		X	TMS 602 Art 3.3F	
<input type="checkbox"/>	Type, size and location of anchors including other details of anchorage of masonry to structural members, frames or other construction.	X		TMS 402 Sec 1.2.1(e), 6.1.4.3, 6.2.1	
<input type="checkbox"/>	Welding of reinforcement	X		TMS 402 Sec 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)	
<input type="checkbox"/>	Preparation, construction and protection of masonry during code weather (temperature below 40 degrees F) or hot weather (temperature above 90 degrees F)		X	TMS 602 Art 1.8C, 1.8D	
<input type="checkbox"/>	Application and measurement of prestressing force	X		TMS 602 Art 3.6B	
<input type="checkbox"/>	Placement of AAC masonry units and construction of thin-bed mortar joints	X		TMS 602 Art 3.3B.9, 3.3F.1.b	
<input type="checkbox"/>	Properties of thin-bed mortar for AAC masonry	X		TMS 602 Art 2.1 C.1	
<input type="checkbox"/>	Observe preparation of grout specimens, mortar specimens and / or prisms.	X		TMS 602 Art 1.4B.2.a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, 1.4B.4	

<input type="checkbox"/>	WOOD CONSTRUCTION: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Inspect high-load diaphragms for grade/thickness of sheathing, nominal size of members, fastener size, number and spacing.		X	Contr. docs	1705.5.1, 2306.2
<input type="checkbox"/>	Metal-plate-connected wood trusses spanning 60 feet or greater: temporary installation restraint / bracing and permanent individual truss member restraint / bracing.		X	App. truss submittal package	1705.5.2

<input type="checkbox"/>	SOILS: Special Inspection and Testing are required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	-	X	Geotech Report, Contract Docs	Table 1705.6
<input type="checkbox"/>	Verify excavations are extended to proper depth and have reached proper material.	-	X		
<input type="checkbox"/>	Perform classification and testing of compacted fill materials.				
<input type="checkbox"/>	Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	-		
<input type="checkbox"/>	Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	-	X		
<input type="checkbox"/>	During fill placement inspector shall verify that proper materials and procedures.	X			

<input type="checkbox"/>	DRIVEN DEEP FOUNDATION ELEMENTS: Special Inspection and Testing are required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify element materials, sizes and lengths comply with the requirements.	X	-	Geotech Report, Contract Docs	Table 1705.7
<input type="checkbox"/>	Determine capacities of test elements and conduct additional load tests, as required.	X	-		
<input type="checkbox"/>	Inspect driving operations and maintain complete and accurate records for each element.	X	-		
<input type="checkbox"/>	Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	X	-		
<input type="checkbox"/>	For steel elements, perform additional special inspections in accordance with Section 1705.2. (See Special Inspections for Concrete Construction.)	-	-		
<input type="checkbox"/>	For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3. (See Special Inspections for Concrete Construction)	-	-		
<input type="checkbox"/>	If applicable, RDP to identify: specialty elements, additional insp.	-	-		

<input type="checkbox"/>	CAST-IN-PLACE DEEP FOUNDATION ELEMENTS: Special Inspection and Testing is required.				
	Type	Continu- ous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Inspect drilling operations and maintain complete and accurate records for each element.	X	-	Geotech Report, Contract Docs	Table 1705.8
<input type="checkbox"/>	Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	-		
<input type="checkbox"/>	For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3. (See Special Inspections for Concrete Construction)	-	-		

<input type="checkbox"/>	HELICAL PILE FOUNDATIONS: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Installation equipment used, pile dimensions, tip elevations, final depth, final installation torque [and any other information required by the RDP] shall be recorded.	X		Geotech Rept, Contr. Docs	1705.9

<input type="checkbox"/>	SPRAYED FIRE-RESISTANT MATERIALS: Special Inspection and testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify surface preparation in accordance with manufacturer's written instructions				1705.14.2
<input type="checkbox"/>	Verify temperature and area ventilation before and after application in accordance with manufacturer's written instructions.				1705.14.3
<input type="checkbox"/>	Verify thickness of sprayed fire resistant materials. a. Minimum of 4 measurements per 1,000 SF of floor, roof, and wall areas, or part thereof at each story. b. Minimum of 25% of structural members at each story.			ASTM E605	1705.14.4
<input type="checkbox"/>	Verify density of sprayed fire resistant materials. a. Minimum of one sample per 2,500 SF of floor, roof, and wall areas, or part thereof at each story. b. Minimum of one sample from each type of structural framing member per 2,500 SF of floor area or part thereof at each story			ASTM E605	1705.14.5
<input type="checkbox"/>	Verify cohesive/adhesive bond strength of sprayed fire resistant materials. a. Minimum of one sample per 2,500 SF of floor, roof, and wall areas, or part thereof at each story. b. Minimum of one sample from each type of structural framing member per 2,500 SF of floor area or part thereof at each story c. Bond tests to qualify a primer, paint, or encapsulant when acceptable bond strength performance between these coatings and the fire resistant material has not been determined.			ASTM E736	1705.14.6
<input type="checkbox"/>	Condition of finished application.				1705.14.1

<input type="checkbox"/>	MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS: Special Inspection and testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Verify surface preparation, application, and thickness in accordance with manufacturer's written instructions when applied to structural elements and decks.			AWCI 12-B	1705.15

<input type="checkbox"/>	EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS): Special Inspection and testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Water-resistive barrier coatings must be inspected when installed over a sheathing substrate.			ASTM E2570	1705.16.1
<input type="checkbox"/>	EIFS applications not over a water-resistive barrier, masonry, or concrete.				1705.16

<input type="checkbox"/>	FIRE-RESISTANT PENETRATIONS AND JOINTS: Special Inspection and testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	For high-rise buildings or Risk Category III or IV buildings inspect through-penetrations and membrane penetration firestops.			ASTM E2174, ASTM E814, UL 1479	1705.17, 714.3.1.2 714.4.2
<input type="checkbox"/>	For high-rise buildings or Risk Category III or IV buildings inspect fire-resistant joint systems and perimeter fire barrier systems.			ASTM: E119, E2393, E1966, E2307, UL 2079	1705.17, 715.3, 715.4

<input type="checkbox"/>	SMOKE CONTROL SYSTEM: Special Inspection and testing is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Smoke control systems are to be tested during erection of ductwork and prior to concealment for leakage testing and recording of device location.		X		1705.18.1
<input type="checkbox"/>	Smoke control systems are to be tested prior to occupancy and after sufficient completion of pressure difference testing, flow measurements and detection and control verification.		X		

<input type="checkbox"/>	FABRICATED ITEMS: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	The RDP shall identify any structural, load-bearing or lateral load-resisting members or assemblies that are specified to be fabricated off site i.e. in a fabricator's shop. Special inspections shall be required for these items unless: a. The fabricator maintains approved detailed fabrication and quality control procedures that provide conformance to the approved construction documents and IBC 2015. b. The fabricator is registered and approved per 1704.2.5.1. See also the Fabricator Form in this packet for these items.				1704.2.5
<input type="checkbox"/>	If the members or assemblies are to be fabricated on site, refer to their respective categories.				

<input checked="" type="checkbox"/>	WIND-FORCE-RESISTANT ITEMS: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Structural wood	X	X		1705.11.1
<input type="checkbox"/>	Cold-formed steel light-frame construction		X		1705.11.2
<input checked="" type="checkbox"/>	Components: Roof covering, roof deck and roof framing connections		X		1705.11.3
<input type="checkbox"/>	Components: Exterior wall covering and wall connections to roof and floor diaphragms and framing.		X		1705.11.3

<input type="checkbox"/>	SEISMIC-FORCE RESISTANT ITEMS: Special Inspection is required.				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Structural steel			AISC 341	1705.12.1.1 1705.13.1.1 1705.13.1.3
<input type="checkbox"/>	Structural steel elements			AISC 341	1705.12.1.2 1905.13.1.2
<input type="checkbox"/>	Structural wood	X	X		1705.12.2
<input type="checkbox"/>	Cold-formed steel light-frame construction				1705.12.3
<input type="checkbox"/>	Designated seismic systems			ASCE 7: 13.2.2	1705.12.4, 1705.13.4
<input type="checkbox"/>	Arch. components: Ext.cladding, interior or exterior nonbearing walls and interior or ext veneer 30 ft or less above grade or walking surface.		X		1705.12.5
<input type="checkbox"/>	Arch. components: Exterior cladding or interior or exterior veneer weighing 5 psf or less.		X		1705.12.5
<input type="checkbox"/>	Arch. components: Interior nonbearing walls weighing 15 psf or less.		X		1705.12.5
<input type="checkbox"/>	Architectural components: Access floors		X		1705.12.5.1
<input type="checkbox"/>	Elect. Equip. anchorage for emergency and standby power systems		X		1705.12.6
<input type="checkbox"/>	Other electrical equipment anchorage		X		1705.12.6
<input type="checkbox"/>	Piping systems / mechanical units designed to carry hazardous materials: installation and anchorage		X		1705.12.6
<input type="checkbox"/>	Ductwork designed to carry hazardous materials: installation and anchorage		X		1705.12.6
<input type="checkbox"/>	Vibration isolation systems: installation and anchorage		X		1705.12.6

<input type="checkbox"/>	Mechanical and electrical equipment, including ductwork, piping, and their structural supports where an automatic fire sprinkler installed in Seismic C, D, E, or F.		X		1705.12.6
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<input type="checkbox"/>	SPECIAL CASES: Special Inspection is required. (1705.1.1)				
	Type	Con- tinuous	Periodic	Reference Standard	Code
<input type="checkbox"/>	Construction materials and systems that are alternatives to materials and systems prescribed by code, not addressed in other sections. [Note to RDP: you must identify specifically what is to be inspected.]				1705.1.1
<input type="checkbox"/>	Unusual design applications of materials described in the code. [Note to RDP: you must identify specifically what is to be inspected.]				
<input type="checkbox"/>	Materials and systems required to be installed per additional manufacturer's instructions that prescribe requirements not contained in the code or in referenced standards. [Note to RDP: you must identify specifically what is to be inspected.]				

Category	Special Inspector Minimum Qualifications
<input type="checkbox"/> Reinforced Concrete	<input type="checkbox"/> Current ICC Reinforced Concrete Special Inspector or ACI Concrete Constr. Inspector <input type="checkbox"/> Concrete field testing by an ACI Concrete Field Testing Technical w/ Grade 1 cert. <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> NYS Registered Design Professional Engineer (RDP) with relevant experience
<input type="checkbox"/> Pre-Stressed Concrete	<u>Pretension Tendons</u> <input type="checkbox"/> Current ICC Reinforced Concrete certification and ACI Concrete Field Testing Technician with Grade 1 certification plus one year relevant experience <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience <u>Post-tension Tendons</u> <input type="checkbox"/> Current Post-Tensioning Institute (PTI) certification <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience
<input type="checkbox"/> Welding	<input type="checkbox"/> Current AWS Certified Welding Inspector <input type="checkbox"/> Current ICC Structural Steel and Welding Certificate plus one year of relevant experience <input type="checkbox"/> Current Level II cert. from American Society for Non-Destructive Testing (NDT) <input type="checkbox"/> Current NDT Level III provided previously certified as NDT Level II
<input type="checkbox"/> High-Strength Bolting & Steel Frame Inspection	<input type="checkbox"/> Current ICC Structural Steel and Welding certification and one year of relevant experience <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience
<input type="checkbox"/> Masonry	<input type="checkbox"/> Current ICC Structural Masonry certification and one year of relevant experience <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience
<input type="checkbox"/> Sprayed Fire-Resistant Materials	<input type="checkbox"/> Current ICC Spray-Applied Fireproofing certification and one year of relevant experience <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience
<input type="checkbox"/> Excavation and filling; verification of soils; piling & drilled piers; modular retaining walls	<input type="checkbox"/> Current Level II certification in geotechnical engineering technology/construction from the National Institute for Certification in Engineering Technologies (NICET) <input type="checkbox"/> Intern Engineer with relevant experience <input type="checkbox"/> RDP with relevant experience
<input type="checkbox"/> Inspection of Fabricators	<input type="checkbox"/> Precast: Current ICC Reinforced Concrete certification plus one year relevant exp <input type="checkbox"/> Bar Joist: see welding requirements <input type="checkbox"/> Metal Building: see welding requirements <input type="checkbox"/> Structural Steel: see welding requirements
<input type="checkbox"/> Seismic Items not addressed elsewhere	<input type="checkbox"/> Qualified person with one year of relevant experience <input type="checkbox"/> RDP with relevant experience <input type="checkbox"/> Intern Engineer with relevant experience
<input type="checkbox"/> Exterior Insulation and Finish System	<input type="checkbox"/> RDP with relevant experience <input type="checkbox"/> Intern Engineer with relevant experience
<input type="checkbox"/> Smoke Control	<input type="checkbox"/> Expertise in fire protection engineering, mechanical engineering and certified as an air balancer <input type="checkbox"/> The RDP responsible for design
<input type="checkbox"/> Fire-Resistant Penetrations & Joints, Special Cases	<input type="checkbox"/> Qualified person with one year of relevant experience <input type="checkbox"/> RDP with relevant experience <input type="checkbox"/> Intern Engineer with relevant experience

Contractor's Statement of Responsibility Form

SUCF Project No: _____

Project Title: _____

Contractor: _____

Contractor's Acknowledgement of Special Requirements

I hereby acknowledge that I have received, read and understand there are special requirements contained in the contract documents. I hereby acknowledge control will be exercised to obtain conformance with the contract documents.

As the Contractor, I will coordinate with the Special Inspector(s) in order to accommodate all inspections and tests as required. I will integrate all inspection activities as provided by the Special Inspector into the Project Schedule.

☐ **I understand if this box is checked, this project includes the construction of a seismic-force-resisting system and / or a wind-force-resisting system as noted on page 2 of the Statement of Special Inspections.**

(Print name / Signature / date)

Fabricator's Certificate of Compliance Form

SUCF Project No: _____

Project Title: _____

Contractor: _____

Fabricator: _____

Fabricated Item: *Structural, load-bearing or lateral load-resisting members of assemblies consisting of materials assembled prior to installation in a building or structure, or subject to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standards referenced by this code, such as rolled structural steel shapes, steel reinforcing bars, masonry units and wood structural panels, or in accordance with a referenced standard that provides requirements for quality control done under the supervision of a third-party quality control agency, are not "fabricated items".*

In lieu of special inspections during fabrication, a fabricator shall provide with the initial shop drawings for consideration:

- The fabricator's written procedural and quality control manuals AND
- Documentation from the most recent audit of fabrication practices.

Date of Last Audit: _____

Company that conducted the Audit:

Contact Person: _____

Name: _____

Address: _____

For ease in evaluation, the Fabricator may attach copies of a Fabricator's Certification or a copy of the latest building code evaluation service report, if applicable.

Date of most recent Approval: _____ **Certification Number:** _____

Certificate issued by: Name: _____ Address: _____

Contact Person: _____

.....
Post Fabrication Certification:

Provide a description of the structural, load bearing or lateral load-resisting assemblies that have been fabricated:

I hereby certify the items described above were fabricated in strict accordance with the approved contract documents.

(Print Name / Signature)

(Print title)

Special Inspector / Approved Agency Final Report

SUCF Project No: _____

Project Title: _____

Contractor: _____

Special Inspector / Approved Agency: _____

We have completed the specified inspections and testing as identified in the Statement of Special Inspections dated _____. To the best of my information, knowledge and belief, the inspections we have completed have been performed and all discovered discrepancies have been reported to the Registered Design Professional in Responsible Charge.

All interim reports submitted prior to this Final Report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,

(Signature / date)

(Seal or Certification)

(Print name)

(Print title)

Office Hours: Academic 8:30 a.m. – 5:00 p.m. Summer 8:00 a.m. – 4:00 p.m. M-F

CONTRACTOR HANG TAG APPLICATION

www.newpaltz.edu/parking

SUNY New Paltz - Parking Office: 114 Wooster Hall - 1 Hawk Drive - Phone (845) 257-3347 -- Fax (845) 257-3009

INSTRUCTIONS: Complete each item on this form. Please print information. Return this form *signed by the Director of DC/ Project Manager* along with *valid vehicle registration, Picture I.D., and your payment* (cash, check, Visa, MasterCard or money order) of \$25.00 to the Parking Office. Please make checks payable to SUNY New Paltz. *If submitting by mail or fax photocopies are needed.*

Director D&C/ Project Manager

Signature _____

Job Site/Contractor: _____

OFFICE USE ONLY

_____ Permit #

_____ Payment

_____ Map

Personal Information

Name: (last) _____ (first) _____ Driver License # & State: _____

Permanent Address: _____

City: _____ State: _____ Zip: _____

Department Name: _____

Permanent Phone: _____ Local/Cell Phone _____

Vehicle Information

Vehicle Registered to: _____ Vehicle Make: _____

Vehicle License Plate #: _____ Vehicle Model: _____

State of Registration: _____ Vehicle Year: _____ Vehicle Color: _____

I am responsible for being aware of all policies stated in the "Parking Rules and Regulations Summary."

Signature

Date

Parking Hangtags Must Be Picked Up In Person at HAB 35

Payment Information (If Submitting by Mail or Fax)

Circle One: Visa MasterCard Credit Card # _____

Expiration Date: _____ Cardholders Name: _____

Daytime Phone: _____ Cardholders Signature: _____

3 Digit CVV/CVC Code on back of card _____ Amount Charging: \$ _____



FIRE PROTECTION SYSTEM SHUTDOWN REQUEST

Date of Request: _____

Name of company/person performing work: _____

Phone/cell where they can be reached 24/7: _____

Name and cell of SUNY Project Manager or representative: _____

Location: Building: _____ Room #s / Area: _____

Description of Work: _____

Type of fire protection system or device affected: (check all that apply)

☐ Fire alarm system ☐ Fire sprinkler system ☐ Hydrant # _____

☐ Other FP system: _____

Exact date(s) and *time(s) work is to be performed: _____

(a minimum of 3 work days are required for all non-emergency related shut downs)

*** ATTENTION SUNY PROJECT MANAGER:** Submit completed form to EH&S, SB 217, Attn: Scott Schulte (by fax 845-257-6915). Once approval is obtained it is the responsibility of the project manager to submit the work request and confirm shutdown occurred before work is permitted to begin *

READ INSTRUCTIONS BELOW CAREFULLY

<ol style="list-style-type: none">Any field left blank or incomplete will result in denial of request.Shutdown request must be submitted by SUNY Project Manager or project supervisor ONLY after receiving approval from Impairment Coordinator.Work cannot begin if there is a chance of fire alarm activation, without approval via signed form.Person(s) performing work must confirm shutdown has been effected prior to commencement of work.*Normal hours for impairment requests are 7:45 a.m.-2:45 p.m. (with seasonal extension possible) and a potential OT per hour charge (\$30) outside these *normal hours could be imposed upon the requestor.Overtime notification must be made between Director/Asst Director FOC & SUNY Project Manager no less than 48 hours prior to shutdown request.	<ol style="list-style-type: none">Approved form must be posted with Building Permit, Hot Work Permit, etc.Work requiring shutdown or turn on during holiday or weekend requires 5 work days notice.If dust is created, area must be ventilated prior to alarm being returned to service.If dust is created, smoke and heat heads must be covered, even when devices are disabled:<ol style="list-style-type: none">Powder-free latex glove or shower capPainters tapeNO duct tape!Damage to fire alarm devices will be the responsibility of the person/company performing work.Persons/entities/organizations deemed by EHS to be causing nuisance/false alarm activations due to failure to follow impairment guidelines may be subject to STOP WORK ORDER, or removal from site.
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FOC advised SUNY Project Manager of overtime applicable to this request: ☐ Yes ☐ N/A By FOC: _____

FOR EH&S USE ONLY:

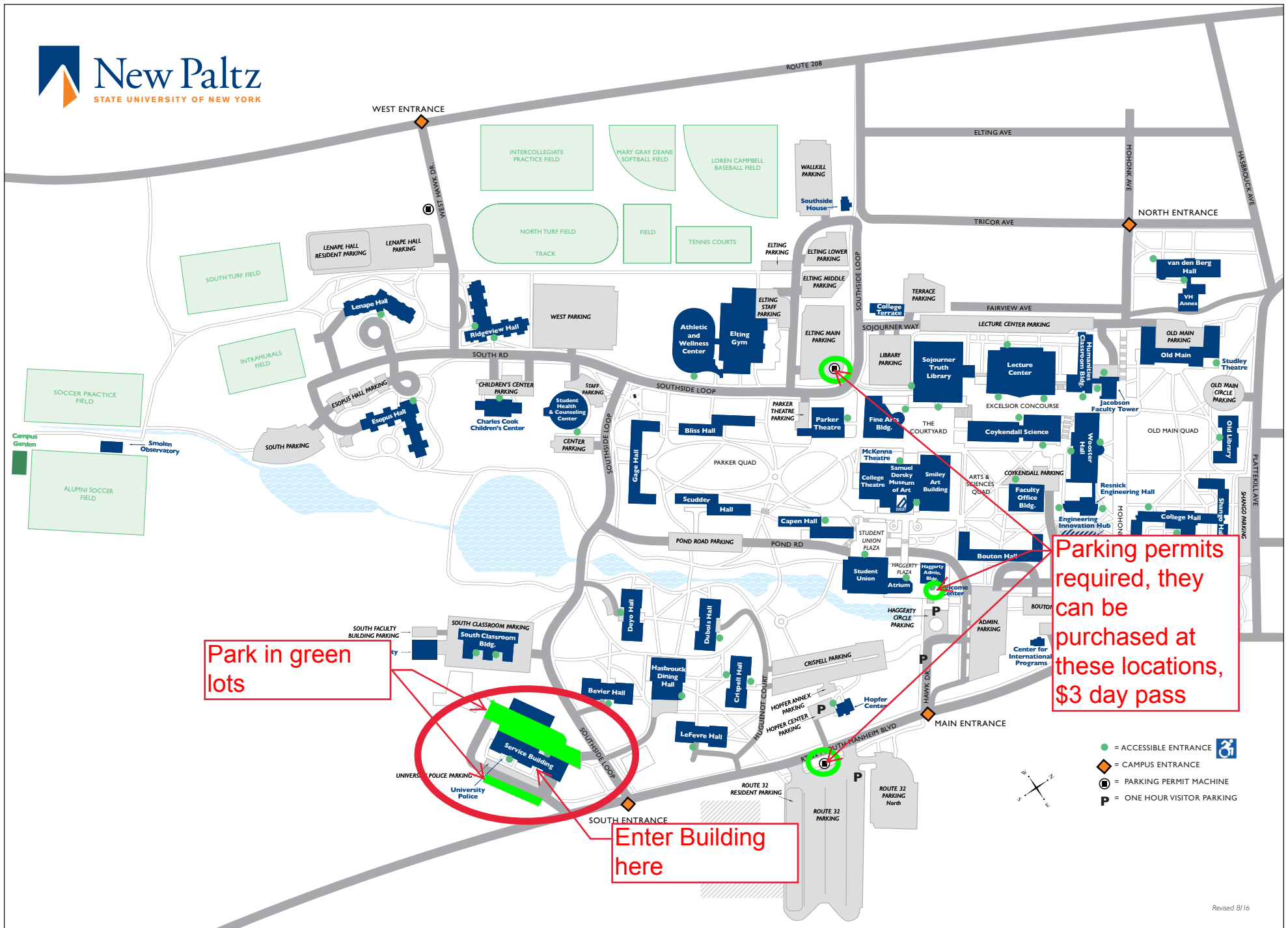
☐ Approved by: _____ Date: _____ Work Request # _____

Special instructions: _____

☐ Denied by: _____ Date: _____

Reasons for denial: _____

General Information			
Work Performed By: Employee / Student / Contractor / Visitor		Application Date: / /	
Qualified Operator Name:		Company Name:	
Qualified Operator Name:		Supervisor/Foreman Name:	
Date(s) of work: / / - / /		Time(s) of work: : M - : M	
Location of work:		Comments:	
Type of Hot Work Being Performed			
Welding		Soldering	
Grinding		Torching	
Fire Watch Designee:		EH&S Training:	
Fire Watch Designee:		EH&S Training:	
Fire Watch Designee:		Date:	
Fire Watch Designee:		Date:	
I certify that I have read and understand the SUNY New Paltz Hot Work Program and will comply with all standards and policies contained within:			
Qualified Operator:_____ Fire Watch Designee:_____			
Qualified Operator:_____ Fire Watch Designee:_____			
Permit applicant to list fire safety systems in hot work area <input type="radio"/> Smoke Detector(s) <input type="radio"/> Sprinkler(s) <input type="radio"/> Fire Hose(s) <input type="radio"/> Fire Extinguisher(s)			
Is there a potential for smoke detectors to be effected in this area? Y / N Special precautions planned to avoid accidental fire detection activation: _____			
Is there a potential for sprinkler activation in this area? Y / N Special precautions planned to avoid accidental activation: _____			
FOR ENVIRONMENTAL HEALTH AND SAFETY USE ONLY			
EH&S APPLICATION REVIEWER SIGNATURE:		EH&S APPLICATION REVIEWER NAME AND DATE:	
APPROVED / DENIED		PERMIT #	



SUNY New Paltz Site Crane Form

Contractor Crane Data

Date _____ Crane # _____
Company Name _____ Operator _____
License # _____ Certificate # _____
Vehicle Plate # _____ Inspection Date _____

Note: For any vehicle with a reach capability of 45' or more, or a 5 ton capacity, the operator must have a valid NYS Crane License. (ICR 23)

This section to be completed by the licensed crane operator:

Cable condition acceptable	_____ yes	_____ no
Slings acceptable	_____ yes	_____ no
Safety latches on hooks acceptable	_____ yes	_____ no
Fire extinguisher on machine	_____ yes	_____ no
Cones, barricades, or tape	_____ yes	_____ no
Swing area barricaded	_____ yes	_____ no
Certificate of Annual Inspection	_____ yes	_____ no
Crane is level & properly blocked	_____ yes	_____ no

I (print name) _____, the New York State licensed and certified crane operator verify that all item identified above have been inspected by me and this crane complies with all the requirements listed in OSHA 29 CFR 1910 and 1926.

Signed: _____ Date: _____

This section to be completed by the Project Manager:

SUNY Coordinator _____ Signature _____

Date SUNY New Paltz was notified about the crane being on site: _____

1) Will the lift be over a building? * _____ yes _____ no

2) Are any overhead electrical lines located in the area? * _____ yes _____ no

* If either answer is yes, the SUNY Safety department must complete the information below.

Yes _____ SUNY EH&S approving the lift. _____
Signature Date

No _____ The safety review has not been completed, do not proceed with lift.

Bldg. _____ Floor _____ Date _____ Project# _____ Location _____

Additional Information: _____

SECTION 02 07 00
SELECTIVE REMOVALS & DEMOLITION

PART 1 - GENERAL**1.01 DESCRIPTION OF WORK****A. Extent of Work**

Removal and demolition of selected items from selected areas of the building as indicated on the Drawings; items to be removed include, but are not limited to, the following:

1. Entire existing roof system including fascias, copings, and skylight/mechanical curbs at the Smiley Arts Building, College Theatre, Dorsky Museum and Faculty Office Building.
2. Roof top mechanical equipment and associated ductwork.
3. Smoke and roof access hatches.
4. Roof Access Doors.
5. Areas of copper batten siding and eifs façade.

- B. Recycling and disposal of non-hazardous waste shall be performed in accordance with Section 01 74 00 - Clean-Up.

1.03 SUBMITTALS**A. Schedule**

Submit a schedule indicating proposed methods and sequence of operations for selective removals and demolition Work, prior to commencement of operations. The sequence of operations shall be planned, in detail, to ensure uninterrupted progress of school sessions.

- B. Submit details and procedures for dust and noise control.

C. Quality Control Submittals**1. Contractor Qualifications**

- a. Provide proof of Contractor and Professional Engineer qualifications specified under "Quality Assurance".
- b. Provide proof of Refrigerant Recovery Technician qualifications.

1.04 RESPONSIBILITY, PROTECTION, DAMAGES, RESTRICTIONS**A. Condition of Space**

The Authority assumes no responsibility for actual condition of the space in which removals and demolition Work is performed.

B. Protections

Provide temporary barricades and other forms of protection required to protect Authority and State University of New York property, personnel, students and general public from injury due to selective removals and demolition work.

1. Provide protective measures as required to provide free and safe passage of students, Authority personnel, State University of New York personnel, and the general public.
2. Protect from damage existing finish work that is to remain in place and which becomes exposed during operations.
3. Protect floors with building paper or other suitable covering.

C. Damages

Promptly repair any and all damages to all property and finishes caused by the removals and demolition work; to the Authority's satisfaction and at no extra cost to the Authority.

D. Explosives

The use of explosives is prohibited.

1.05 QUALITY ASSURANCE**A. Qualifications**

1. Company specializing in performing the Work of this Section shall have a minimum of 3 years experience and shall have worked on 3 projects of similar size.
2. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Regulatory Requirements

1. Work of this Section shall conform to all requirements of the NYS Building Code and all applicable regulations and guidelines of all governmental authorities having jurisdiction, including, but not limited to, safety, health, and anti-pollution regulations. Where more stringent requirements than those contained in the Building Code or other applicable regulations are given in this Section, the requirements of this Section shall govern.
2. Conform to the requirements of "Safety and Health Standards, Subpart P - Excavations, Trenching and Shoring" - OSHA.

PART 2 - PRODUCTS - NOT APPLICABLE**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Prior to commencement of the selective removals and demolition Work, inspect the areas in which the Work will be performed. Determine and list the existing conditions of rooms or area surfaces and equipment. After the Work in each respective area is completed, determine if adjacent surfaces or equipment have been damaged as a result of the Work; if so, the damage shall be corrected at the Contractor's expense.
- B. Create a safety zone around the demolition area as per Section BC 3306 of the 2020 NYS Building Code. Fences/barriers shall be erected to prevent persons other than workers from entering.

3.02 REMOVALS AND DEMOLITION WORK

- A. Perform selective demolition Work in a systematic manner and use such methods as are required to complete the Work indicated, and in accordance with the Specifications and governing City, State, and Federal regulations.
- B. When walls, partitions, floors, and ceilings (or portions thereof) are indicated to be removed; unless indicated otherwise:
 1. Remove all items attached to the surfaces of the construction to be removed.

2. Remove all plumbing piping, fixtures, accessories and rough-in occurring on or in the construction to be removed; cap piping and/or re-route lines as indicated or required.
3. Remove all connectors, piping, ductwork and other HVAC items and accessories occurring on or in the construction to be removed; cap and/or re-route piping and ductwork as indicated or required.
4. Remove all electrical wiring, to include, but not limited to, lighting, communications, alarms and all related appurtenances, conduits, devices, fixtures, and other electrical items and accessories occurring on or in the construction to be removed; disconnect power and remove wiring and conduit back to source.

3.03 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from the removals and demolitions from the building immediately; transport and legally dispose of materials off-site. Disposal method shall be in accordance with City, State, and Federal regulations. Items to be retained by the State University of New York shall be delivered to locations indicated in the Article titled "Ownership of Materials".
- B. Burning of removed materials is not permitted on the job site.

3.04 CLEAN-UP AND REPAIR

- A. Upon completion of removals and demolition Work, remove tools, equipment and all remaining demolished materials from the site.
- B. Repair all damaged areas caused by the removals and demolition Work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- C. Contractor shall not use leaf blower during any stage of removal.
- D. All areas in which Work was performed under this Section shall be left "broom-clean."

3.05 OWNERSHIP OF MATERIALS

- A. All equipment, materials, and items removed shall remain the property of the State University of New

York, if desired; equipment, material and items not desired to be re-used or retained by the Authority and the State University of New York shall be removed from the site by the Contractor. The Authority's Representative will designate which equipment, materials and items will be retained.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Shop Drawings: for work not Considered minor alterations or Ordinary Repairs	_____	_____
Schedule: 1. Schedule of proposed Methods 2. Sequence of operations:	_____	_____
Details & procedures for dust & noise control:	_____	_____
Receipt for salvaged items:	_____	_____
Qualifications:	_____	_____
1. Contractor 2. Professional Engineer 3. Refrigerant Recovery Technician.		

* * *

SECTION 02 82 13- ASBESTOS ABATEMENT

Asbestos

The following shall apply to the abatement of asbestos being done under this contract:

- a. **Applicable Regulations:** All work to be done under this Contract shall be in compliance with Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (cited as 12 NYCRR Part 56), as currently amended, and applicable federal and state regulations.
- b. **Presumed Asbestos-Containing Material:** During any work of this contract that disturbs existing material, all material that can be defined as “presumed asbestos-containing material” according to 29 CFR Part 1926 **and guidance documents published by New York State Department of Health’s (NYSDOH) Environmental Laboratory Approval Program (ELAP) and Bureau of Occupational Health (BOH), and the NYS Department of Labor (DOL)** shall be considered asbestos-containing materials unless asbestos test results bound at the end of this section indicated otherwise; or if the Contractor, at its own expense, tests the presumed asbestos-containing material and rebuts the presumption, as permitted by 29 CFR Part 1926.
- c. **Applicable Variance:** During the performance of the work, comply with the requirements of variance(s), if any, obtained by the Owner and/or consultant, which are bound after this section. The Contractor is responsible for the cost and the time required to obtain any additional variance(s) that they deem desirable in the performance of the work and feel may be consistent with the policies/ procedures as set forth in 12 NYCRR Part 56. **Prior to requesting any additional variance(s), submit a draft(s) of the request to the Consultant and the Fund for review and approval.** Copies of all additional variance(s) obtained by the Contractor shall be provided to the Consultant, Fund and the Campus prior to performing any work affected by the additional variance(s).
- d. **Owner Project Fact Sheet:** The Contractor shall complete and submit three copies of the Asbestos Material Fact Sheet (appended to this Section) to the Fund prior to the project startup. If the initial submission is not complete for a reason approved by the Fund, the complete Asbestos Material Fact Sheet shall be submitted prior to acceptance of the applicable work.
- e. **Air Monitoring:** The Owner shall be responsible for hiring and paying an independent third party firm to perform the requirements of air monitoring as called for in 12 NYCRR Part 56 and as permitted in Section 2.17 of the Agreement. The Owner’s air monitoring firm shall provide 24 hour turn around on tests, will work during the hours between 7 AM and 4 PM on Monday through Friday unless otherwise agreed to by the Owner, and may inspect the work for cleanliness prior to performing sampling. Cooperate with the Owner’s air monitoring firm in sequencing and scheduling the work in concert with the air monitor’s availability. Provide access, electrical power and lighting, cleaning, and other work required to facilitate successful air monitoring activities. Provide additional air monitoring,

at no expense to the Owner, as required to protect and monitor on site workers if required by applicable safety regulation or the contractor's safety plan.

- f. Disposal Procedures: It is the responsibility of the Contractor to determine and comply with the waste handling, transportation and disposal regulations in effect at the time the work is performed, as applicable to the work site(s) and proposed waste disposal facility/landfill(s). The asbestos contractor must comply fully with the latter regulations and all other applicable U.S. Department of Transportation, Environmental Protection Agency (EPA), and other Federal, State and local rules and regulations in effect at the time the work is performed. Submit three copies of all pertinent manifests to the Owner. Use a single source facility for disposal of all waste of similar type and category.
- g. Submittals: Prior to commencement of the work on this project, the Contractor must submit the following to the Owner:
 - 1) Copy of original insurance policy.
 - 2) Copy of Department of Labor notification.
 - 3) Copy of EPA notification.
 - 4) Abatement Plan Layout - Decon, Negative Air Lines, Variances.
 - 5) SUCF Asbestos Removal Fact Sheet.
 - 6) Product Information - Encapsulant, Mask, etc.
 - 7) Material Safety Data Sheets.
 - 8) Asbestos Handling License.
 - 9) Waste Transporter Permits.
 - 10) Dumping Receipt - Waste Manifest.
 - 11) Testing Lab - License, Certification.
 - 12) Employees - Workers Acknowledgement, Certification.
 - 13) Supervisor's Certification
- h. Special Requirements
 - 1) The drawings, schedules and specifications indicate the applicable scope of abatement work.
 - 2) The Contractor shall have at least one English-speaking supervisor on the job site at all times while the project is in progress.
 - 3) Prior to the commencement of work involving asbestos demolition, removal, and/or renovation, the Contractor must submit to the Owner the name of its on-site asbestos supervisor responsible for such work and the named supervisor's NYS certification documentation showing completion of an EPA approved training course for asbestos supervisors. The approved supervisor shall maintain such certification during the work and be on site at all times when abatement work is being performed.

- 4) If a waste shipment record has not been returned to the Owner within 45 days, a report must be filed by the Owner with the EPA describing the steps the Owner has taken to determine the status of the shipment. During the Owner's preparation of the latter report, the Contractor shall give its constant personal attention and assistance in determining the status and disposition of the shipment.

**STATE UNIVERSITY CONSTRUCTION FUND
ASBESTOS MATERIAL REMOVAL FACT SHEET**

SUCF PROJ NO. _____ PROJECT TITLE _____ DATE _____

SCOPE OF WORK: _____

ASBESTOS CONTRACTOR: Name/Address _____ _____ Phone No.: _____	PRIME CONTRACTOR: (If applicable) _____ _____ Phone No. _____
Contract Award Amount: _____	Asbestos Lic No. _____
Contract Completion Date: _____	Expiration Date: _____

ASBESTOS ABATEMENT PERSONNEL: (Attach Additional Sheets as Required)

	Name	Title/Function	Social Security No.	Certificate No.	Expir. Date
1.	_____				
2.	_____				
3.	_____				
4.	_____				
5.	_____				

ASBESTOS ABATEMENT WORK: (Attach Additional Sheets as Required)

	Bldg (1) Usage	Removal Location (Bldg/Room)	Mat'l (2) Removed.	Quantity (3)	Methods of Removal
1.	_____				
2.	_____				
3.	_____				
4.	_____				
5.	_____				

Date Removal Begins: _____ Date Removal Ends _____

Asbestos Carrier _____ Disposal Site _____

Phone No. _____ Phone No. _____

Hauler Permit No.(s): _____

NOTE: In addition to the above information, the contractor shall submit all required documentation as stipulated by the New York State Labor Law Article 30; Part 56, 12NYCRR, which includes a copy of the asbestos contractor license and all asbestos handling certificates, waste transporters permits, disposal receipt acknowledgement, and air test reports (prior, during, and after abatement)

**STATE UNIVERSITY CONSTRUCTION FUND
ASBESTOS MATERIAL REMOVAL FACT SHEET**

KEY

BUILDING USAGE

A	Administration	F	Dormitory
B	Academic	G	Mechanical Room
C	Library	H	Steam Tunnel
D	Health/Physical Education	I	Other
E	Dining Halls		

MATERIAL REMOVED

Acoustical/Decorative Plasters =	ADP
Fireproofing Materials =	FM
Troweled Wall/Ceiling Plasters =	TCP
Mud Joints/Tees =	MJT
Pipe Covering =	PC (List Pipe Size)
Boiler/Hot Water Tank Insulations =	BHTI
Panels/Ceiling Tiles =	PCT
Transite Panels =	TP
Vent/Drain Pipes =	VDP (List Size)
In-Place Gaskets =	IPG
Vinyl Asbestos Siding =	VAS
Vinyl Asbestos Tile =	VAT
Vinyl Asbestos Roofing =	VAR
Other (Describe) =	0:

QUANTITY OF MATERIAL

S.F. = Square Feet i.e. Walls, Ceiling, etc.
L.F. = Linear Feet i.e. Pipe, etc.

WET

DRY

GLOVEBAG

TENT

OTHER _____

APPENDIX A

- Asbestos Report



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RENOVATION SURVEY FOR ASBESTOS-CONTAINING MATERIALS AND LEAD-BASED PAINT

PERFORMED AT:

State University of New York New Paltz
1 Hawk Drive
New Paltz, New York 12561
Adelaide Project# SZER: 20115.00-IN

PREPARED FOR:

Mr. John O'Connor
MDSzerbaty Associates Architecture
307 Seventh Avenue, 1501
New York, New York 10001

PREPARED BY:

David Seddon
January 28, 2021 AMENDED

REVIEWED BY:

A handwritten signature in blue ink, appearing to read "Stephanie A. Soter".

Stephanie A. Soter
President

Version	Date	Prepared by
1	04/23/2020	David Seddon
2	01/18/2021	David Seddon
3	01/28/2021	David Seddon

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1.0 Introduction

1.1 Scope of Work / Project Personnel

Adelaide Environmental Health Associates, Inc. (**Adelaide**) performed an Asbestos and Lead Based Paint Survey for Building/Structure Demolition, Renovation, Remodeling and/or Repair, in conformance with ALL Federal, State and Local regulations, on April 6th and 7th, 2020 for MDSzerbaty Associates Architecture throughout Faculty Office Building, Smiley Art Building, Theater Building and the Museum Building Roofs, located at The State University of New York New Paltz. The survey included 1) review of building/structure plans, provided by MDSzerbaty Associates Architecture, for references to the scope of work potentially affecting hazardous materials used in construction, renovation or repair; and, 2) a visual inspection/assessment for hazardous materials throughout accessible interior and/or exterior spaces of the building/structure or portion thereof identified to be demolished, renovated, remodeled or repaired. Certified **Adelaide** personnel (Appendix E), David Seddon (NYS Asbestos Inspector/Cert. #09-08546 and EPA Lead-based Paint Inspector/Cert. #LBP-I-101120-1), performed the visual assessment throughout inspection area(s) identified.

At the request of MDSzerbaty Associates Architecture, **Adelaide** sent the remaining twenty eight (28) samples that were held due to budgetary restrictions. The samples were sent in on January 14, 2021 and analyzed on January 15, 2021.

The following indicates assumed materials due to inaccessibility at the time of the inspection. Two (2) homogeneous areas are assumed positive for asbestos.

1.2 Executive Summary

Following the scope of work that was provided to us, **Adelaide** inspected all areas that will be affected by the proposed scope of work for suspect ACM and LBP. **Adelaide** collected fifty five (55) suspect asbestos samples/layers and eight (8) XRF readings [including calibrations] from the above-mentioned area(s). Two (2) samples/homogenous areas tested positive for asbestos and zero (0) XRF readings tested positive for lead-based paint.

Twenty eight (28) suspect asbestos samples were analyzed on January 15, 2021. Two (2) samples/homogenous areas tested positive for asbestos.

1.2.1 Conclusions and Recommendations

The following conclusions and recommendations are prepared by **Adelaide** as per the provided scope of work for Building/Structure Demolition, Renovation, Remodeling and/or Repair. Should the scope of work change, it is recommended that the findings be revisited to determine if additional sampling will be required to satisfy ALL Federal, State and Local regulations.

1.2.2 Asbestos-containing Materials (ACM)

- This survey concluded that the materials listed in Section 2.1 either tested and/or are assumed ***positive for asbestos.***

- Subpart 56-5(h) of 12 NYCRR Part 56 requires that no demolition, renovation, remodeling, or repair work be commenced by any owner or the owner's agent prior to the completion of asbestos abatement. Asbestos abatement must be performed by an asbestos abatement contractor that maintains a current asbestos handling license, and employs NYSDOL/NYCDEP certified asbestos handlers and supervisors. It is recommended that a 12 NYCRR 56 certified Project Monitor oversee abatement activities.
- Subpart 56-5(g) of 12 NYCRR Part 56 specifies requirements for transmittal of asbestos survey information by the owner or owner's agent. (1) One copy of the asbestos survey report shall be sent to the local government entity charged with issuing a permit for such demolition, renovation, remodeling, or repair work under applicable State or local laws. (2) If controlled demolition or pre-demolition activities will be performed, one copy of the asbestos survey report shall be submitted to the appropriate Asbestos Control Bureau district office. (3) One copy of the asbestos survey report must be kept on the construction site throughout the duration of the asbestos project and any associated demolition, renovation, remodeling, or repair project.

1.2.3 Lead-based Paint (LBP)

- This survey concluded that the materials listed in Section 2.4 tested **negative for lead-based paint**.

2.0 Summary of Hazardous Materials

2.1 Summary of Identified ACM/PACM

KEY: **ACM** = Materials containing greater than 1% of asbestos; **HA** = Homogeneous Area; **LF** = Linear Feet; **SF** = Square Feet; **PACM** = Presumed Asbestos-containing Materials; **Friable** = ACM capable of being released into air, and which can be crumbled, pulverized, powdered, crushed or exposed by hand-pressure.

Samples collected by **Adelaide** April 6th and 7th, 2020

HA	Identified ACM	ACM Location(s)	Approx. Qty.	Condition	Friable? (Yes or No)
008	Caulking at Vents/Windows on Copper Siding	Smiley Art Building - Roof R2	1,000 LF	Damaged	No
		Theater Building – Roof R10	35 LF	Damaged	No
		Theater Building – Roof R8	35 LF	Damaged	No
		Theater Building – Roof R7	168 LF	Damaged	No
022	Tar on Flashing at Copper Wall Covering	Museum Building – Roof R3E (Adjacent to Roof R9)	4 SF	Good	No
		Theater Building – Roof R5 (Adjacent to Roof R9)	4 SF	Good	No

HA	Identified ACM	ACM Location(s)	Approx. Qty.	Condition	Friable? (Yes or No)
030 and 040	Tar at Skylight Curbs and Exhaust Curbs	Smiley Art Building – Roof R1	268 SF	Good	No
	Tar at Wall Sections, Skylight Curbs and Exhaust Curbs	Smiley Art Building – Roof R2	524 SF	Good	No
	Tar at Wall Section and RTU Curbs	Theater Building – Roof R4	280 SF	Good	No
	Tar Wall Sections	Theater Building – Roof R5 (Adjacent to Roofs R8, R9 and R10)	130 SF	Good	No
	Tar at Wall Sections, Skylight Curbs, Exhaust Curbs, Parapet Walls, RTU Curbs, Roof Hatches	Museum Building – Roof R3 A, B C, D and E	400 SF	Good	No
Assumed	Roof Drain Fittings and Pipe Insulation for Four (4) Roof Drains	Theater Building – Roof R6	20 LF	Unknown	Yes
	Roof Drain Fittings and Pipe Insulation for Six (6) Roof Drains	Smiley Art Building – Roof R1	30 LF	Unknown	Yes
NOTE: Roof drains are not slated for removal per documentation provided. The scope of work at the drains is to remove the domes and clamps, cleanout the existing bowls and provide a new retrofit drain. Leaving the existing drain bowl in place.					

2.2 Summary of Identified Non-ACM



Samples collected by **Adelaide** April 6th and 7th, 2020

Identified Non-ACM	Sample Location(s) & HA's
EPDM Sealant	Faculty Office Building – Roofs
Main Roof Barrier Paper – Brown	Faculty Office Building – Roofs
Main Roof ISO Paper	Faculty Office Building – Roofs
Drywall and Paper Cover at Skylights	Faculty Office Building – Interior
Asphalt Shingles and Vapor Barrier	Faculty Office Building – Peak Roofs
Stucco – Adjacent to Flashing	Museum Building – All Roofs
	Theater Building – Roofs R5 and R10
Dens Deck Roof Deck	Smiley Art Building Roofs R1 and R2
	Museum Building – All Roofs
EPDM Sealant and ISO Paper	Museum Building – All Roofs
	Theater Building – All Roofs
	Smiley Art Building – All Roofs
Bottom Layer Roofing Material	Smiley Art Building – Roofs R1 and R2
Brown and Tar Paper under Copper Siding	Smiley Art Building – Roof R2
Brown and Tar Paper under Copper Siding	Theater Building – Roof R4, R7, R8 and R10

Identified Non-ACM	Sample Location(s) & HA's
HVAC Duct Wrap	Theater Building – Roofs R4, R8 and R10
	Museum Building – Roof 3E
Main Field Built up Roofing	Theater Building – Roofs R4, R5, R8, R9 and R10
Tar on Concrete Deck	Theater Building – Roofs R4, R5, R8, R9 and R10
Bottom Layer Roofing	Theater Building – Roofs R4, R5, R8, R9 and R10
Layered Paper Roofing	Theater Building – Roofs R4, R5, R8, R9 and R10
Tectum Roof Deck	Theater Building – Roofs R6 and R7
Water Barrier at Edge of Termination Wall	Theater Building – Roofs R5, R8 and R10
Tar at Edge of Termination Wall	Theater Building – Roofs R5, R8 and R10
Ceiling Plaster Top and Base Coats at Skylights	Theater Building Interior – Entry Way, Art Building Room 204
2x2 Ceiling Tiles at Skylights	Theater Building Hallway
1x1 Ceiling Tile at Skylights	Art Building Rooms – Throughout Second Floor
Gray Skylight Sealant	Smiley Art Building – Roofs R1 and R2, Theater Building – Roofs R8 and R10
Caulking at Column and Flashing	Theater Building – Roofs R5 and R10
Black Sealant at Skylights	Museum Building – Roof R3E
Caulking at Stucco and Flashing	Museum Building – Roof R3B
Tar Layer Between ISO	Smiley Art Building – Roofs R1 and R2
Silver Coating on Exhaust Units	Smiley Art Building – Roofs R1 and R2
Pitch Pocket Material	Theater Building – Roofs R4, R5, R8 and R10
Tar at Skylight Curb	Theater Building – Roof R5
Main Field Top Layer on Concrete	Theater Building – Roof R4
Vent Pipe and Roof Drain Tar	Smiley Art Building – Roof R1 and R2, Theater Building – Roofs R4, R5, R6, R7, R8, R9 and R10, Museum Building – Roof R3 A, B C, D and E

2.3 ACM Photos

<p>HA 030 and 040 Tar (i.e. Wall Sections, Skylight Curbs, Exhaust Curbs, Parapet Walls, RTU Curbs, Roof Hatches, etc.) 5.6% - 6.1% Chrysotile</p>	
--	--

HA 008 Caulking at Vents 4.5% Chrysotile	
HA 022 Tar on Flashing at Copper Wall Covering 7.3% Chrysotile	

2.4 Summary of Identified LBP

Based on review of the data generated by the Thermo Scientific Niton XLp 300A Analyzer, the following surfaces tested were identified as lead-based, as defined by HUD/EPA (equal to or in excess of 1.0 milligram per square centimeter):

Readings collected by **Adelaide** April 6th and 7th, 2020

Location of LBP	LBP Component	Substrate	Color	Condition	Readings (mg/cm ²)
<i>NO Lead-based Paints identified above HUD/EPA standards of readings collected in reference to the above-mentioned scope of work.</i>					

2.5 Observations

ASBESTOS-CONTAINING MATERIALS (ACM)

A visual inspection was performed and homogeneous material types were established based on appearance, color and texture. The findings presented in this report are based upon reasonably available information and observed site conditions at the time the assessment was performed. The findings and conclusions of this report are not meant to be indicative of future conditions at the site and does not warrant against conditions that were not evident from visual observations or historical information obtained from others.

Representative bulk sampling was performed on suspect building materials for laboratory analysis and the following is a summary of installed building materials sampled as per the scope of work provided:

- Ceiling Materials – Plaster, Sheetrock, Joint Compound, Ceiling Tiles (multiple types).
- Wall Materials – Plaster, Sheetrock, Joint Compound, Barrier Paper (multiple types), Stucco.
- Roofing Materials – Built Roofing Layers, EPDM Sealant and ISO Barriers, Vapor Barrier/Tar, Shingle and Barrier Paper, Roof Decks (multiple types).
- Thermal System Insulation – HVAC Duct Wrap.
- Miscellaneous Materials – Caulking (multiple types – Vents, Windows, Flashing).
- Non-suspect Materials (not sampled) – Fiberglass Insulation, Silicone, Wood, Glass, Metal.

3.0 Asbestos-containing Materials (ACM)

3.1 Field Procedures and Analysis Methodology

Guidelines used for the inspection were established by the U.S. Environmental Protection Agency (EPA) in the Guidance for Controlling Asbestos Containing Materials in Buildings, Office of Pesticides and Toxic Substances, DOC# 560/5-85-024 and 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA) and Title 12 NYCRR Part 56-5.1. Field information was organized as per the AHERA concept of a homogeneous area (HA); that is, suspect Asbestos-containing Materials (ACM) with similar age, appearance, and texture were grouped together, sampled and assessed for condition.

For the purposes of this inspection, suspect ACM has been placed in three material categories: thermal, surfacing, and miscellaneous. 1) Surfacing materials are those that are sprayed on, troweled on or otherwise applied to surfaces for fireproofing, acoustical, or decorative purposes (e.g., wall and ceiling plaster). 2) Thermal materials are those applied to heat pipes or other structural components to prevent heat loss or gain or prevent water condensation (e.g., pipe and fitting insulation, duct insulation, boiler flue). 3) Miscellaneous materials are interior building materials on structural components, structural members or fixtures, such as floor and ceiling tiles, etc. and do not include surfacing material or thermal system insulation.

SURFACING MATERIALS

Surfacing materials were grouped into homogeneous sampling areas. A homogeneous area contains material that is uniform in color and texture and appears identical in every other respect. Materials installed at different times belong to different sampling areas. Homogeneous areas were determined on per floor basis.

The following protocol was used for determining the number of samples to be collected:

- At least three bulk samples were collected from each homogeneous area that is 1,000 square feet or less.
- At least five bulk samples were collected from each homogeneous area that is greater than 1,000 square feet but less than or equal to 5,000 square feet.
- At least seven bulk samples were collected from each homogeneous area that is greater than 5,000 square feet.

THERMAL SYSTEM INSULATION (TSI)

The concept of homogeneous sampling areas applies equally well to thermal insulation as to surfacing material. A "typical" building may contain multiple insulated pipe runs from any combination of the following categories:

- Hot water supply and/or return
- Cold water supply
- Chilled water supply
- Steam supply and/or return
- Roof or system drain

The following protocol was used for determining the number of samples to be collected.

- Collect at least three bulk samples from each homogeneous area of thermal system insulation.
- Collect at least one bulk sample from each homogeneous area of patched thermal system insulation if the patched section is less than 6 linear or square feet.
- In a manner sufficient to determine whether the material is ACM or not ACM, collect a minimum of three bulk samples from each homogeneous insulated mechanical system tee, elbow, and valve.

Bulk samples are not collected from any homogeneous area where the certified inspector has determined that the thermal system insulation is fiberglass, foam glass, or rubber.

MISCELLANEOUS MATERIALS

Miscellaneous materials are grouped into different homogeneous areas and at least two bulk samples are collected from each homogeneous area as per the clarification letter from the EPA and the Professional Abatement Contractors of New York, Inc in November of 2007.

Samples collected were analyzed by a laboratory approved under the New York State Department of Health Environmental Laboratory Approval Program (NYSDOH ELAP). Samples were analyzed in the laboratory by Polarized Light Microscopy (PLM), Polarized Light Microscopy-NOB (PLM-NOB) and/or Quantitative Transmission Electron Microscopy (QTEM), as required. Sample collection and laboratory analysis were conducted in compliance with the requirements of Title 12 NYCRR Part 56-5.1, 29 CFR 1926.1101 and standard EPA & OSHA accepted methods. Samples consisting of multiple layers were separated and analyzed independently in the laboratory.

3.2 Regulatory Guidelines and Requirements for ACM

FEDERAL

In accordance with the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) established National Emission Standards for hazardous Air Pollutants (NESHAP) to protect the public from exposure to airborne pollutants. Asbestos was one of the air pollutants, which was addressed under the NESHAP 40 CFR Part 61. The purpose of asbestos NESHAP regulations is to protect the public health by minimizing the release of asbestos when facilities, which contain ACM, are being renovated or demolished. EPA is responsible for enforcing regulations related to asbestos during renovations and demolition, however, the CAA allows the EPA to delegate this authority to State and Local Agencies. Even after EPA delegate's responsibility to a state or Local agency, EPA retains the authority to oversee agency performance and to enforce NESHAP regulations as appropriate.

NEW YORK STATE

Asbestos in New York State is regulated under the Labor Law Section 906, Part 56 of Title 12 of the Official Compilation of Codes, Rules, and Regulations. Within the department and for the purpose of the Department of Labor, this part (rule) is known as Industrial Code Rule No. 56 (ICR 56) relating to hazards to the public safety and health, during the removal, encapsulation, or disturbance of friable asbestos, or any handling of ACM that may result in the release of asbestos fiber.

As specified in Title 12 NYCRR Part 56-5.1 (h) and (i), "If the building/structure asbestos survey finds that the portion of the building/structure to be demolished, renovated, remodeled, or have repair work contains ACM, PACM, suspect miscellaneous ACM assumed to be ACM, or asbestos material, which is impacted by the work, the owner or the owner's agent shall conduct, or cause to have conducted, asbestos removal performed by a licensed asbestos abatement contractor in conformance with all standards set forth in this Part. All ACM, PACM, suspect miscellaneous ACM assumed to be ACM, or asbestos material impacted by the demolition, renovation, remodeling or repair project shall be removed as per this Part, prior to access or disturbance by other uncertified trades or personnel. No demolition, renovation, remodeling or repair work shall be commenced by any owner or the owner's agent prior to the completion of the asbestos abatement in accordance with the notification requirements of this Part...All building/structure owners and asbestos abatement contractors on a demolition, renovation, remodeling, or repair project, which includes work covered by this part, shall inform all trades on the work site about PACM, ACM, asbestos material and suspect miscellaneous ACM...Bids may be advertised and contracts awarded for demolition, remodeling, renovation, or repair work, but no work on the current intermediate portion of the project shall commence on the demolition, renovation, remodeling or repair work by any owner or agent prior to completion of all necessary asbestos abatement work for the current intermediate portion of the entire project, in conformance with all standards set forth in this Part." All work conducted should be in accordance with all legal requirements, including but not limited to U.S. Environmental Protection Agency (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) [40 CFR Part 61], New York State Industrial Code Rule 56 Asbestos Regulations (ICR 56) and Chapter 1 of Title 15 of the Rules of the City of New York Regulations, as applicable. Advance notification of the asbestos project to the USEPA, NYSDOL, and NYCDEP may be required.

NEW YORK CITY

Asbestos Control Program (ACP), Title 15, Chapter 1 of the New York City Department of Environmental Protection (NYCDEP) regulates all asbestos abatement activities occurring within the City of New York.

The ACR regulations also require asbestos surveys and abatement work to be performed by a NYCDEP certified asbestos investigator and asbestos workers, respectively.

The New York City Department of Buildings (NYCDOB) requires an ACP notification to be included with the renovation/demolition permit applications. The notification is performed using an ACP 5 or ACP 20/21 forms.

All confirmed ACM will need to be removed prior to any building renovation or demolition. The removal and disposal of ACM must be performed by a NYS-DOL licensed asbestos handling contractor in accordance with Federal, state, and local regulations. Proper notifications must be filed with the US-EPA, NYS-DOL, NYC-DEP and other regulatory agencies prior to performing such activities.

As required by the NYS-DOL and NYC-DEP regulations, the abatement project must be monitored by a NYS-DOL certified project monitor. The project monitor oversees contractor's work practices and also performs pre, during, and final clearance post abatement air sampling in accordance with the state and city regulations.

CONCEALED ACM

In addition to the ACMs identified at the site, there is a possibility that concealed suspect ACM may exist at the building/structure. As such, if any concealed suspect ACM is encountered during future construction related activities, the work should immediately stop. Prior to resuming the work, the suspect ACM should either be 1) Sampled by an appropriately-certified asbestos professional and submitted to an Approved NYSDOH ELAP laboratory for asbestos analysis or 2) Presumed to be ACM (PACM) and removed by a licensed asbestos abatement contractor for disposal in accordance with all applicable regulations.

4.0 Lead-based Paint (LBP)

4.1 Applicable Standards/Guidelines for LBP

The U.S Department of Housing and Urban Development (HUD) defines the action level for lead-based paint as a lead content equal to or greater than 1.0 milligrams of lead per square centimeter of painted surface ($\geq 1.0 \text{ mg Pb/cm}^2$) when measured with an XRF analyzer or 0.5 percent by weight when chemically tested. This definition is described in the HUD "Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing, September 1990". The state of New York's definition of the action level for lead-based paint is consistent with the level established by HUD.

Please note that although the HUD defines lead based paint as paint having lead concentrations equal or greater than 1.0 mg/cm², the Occupational Safety and Health Administration (OSHA) considers any concentration of lead in paint to be lead containing paint. Regardless of the lead concentrations in paint, the contractor shall comply with 29 CFR 1926.62, OSHA regulations, and take precautionary measures for dust control and limit employee exposure to lead dust during the renovations.

Painted surfaces that would be impacted by planned activities such as drilling, cutting, scrapping, etc. and create dust should be properly addressed by following safe work practices, good housekeeping procedures and/or following proper abatement procedures. Grinding and sanding of paint without HEPA filter exhaust, open flame gas fired torch, unconfined abrasive blasting, and chemical strippers containing methylene chloride or other human carcinogenic chemicals are not recommended.

The Federal Resource Conservation and Recovery Act (RCRA) regulation governs the handling, transportation, and disposal of hazardous materials. Every demolition/renovation debris generator has the responsibility to determine whether the debris exhibits one or more of the characteristic wastes listed in subpart C of 40 CFR Part 261. In the case of demolition debris, lead in LBP is a characteristic waste, and therefore, it is the responsibility of the renovation/demolition debris generator to characterize the waste prior to its disposal and, if found to be hazardous waste as defined by Federal Statutes, to be properly handled and disposed.

Metal objects painted with LBP are exempt from disposal regulations applicable to lead, provided they are properly recycled. All metal objects that are painted with LBP should be sent to a certified recycling facility.

This report is not Lead-based Paint abatement specification and should not be used for specifying removal methods or techniques.

4.2 XRF Information

Thermo Scientific Niton XLp 300A X-Ray Fluorescence (XRF), Heuresis Corp. Pb200i X-Ray Fluorescence (XRF) Analyzer(s) were used to survey the building/structure or portion thereof identified to be demolished, renovated, remodeled or repaired for the presence of LBP. The XRF analyzers are using a sealed source of XLp 300A X-Ray Fluorescence (XRF) Cd109 with 40mCi and the Pb200i X-Ray Fluorescence (XRF) Co 57 with 5mCi sources, meeting HUD requirements for the analysis of paint films. During the analysis, the intensity of the x-rays is converted by the instrument's internal software into an estimate of the concentration of lead in the substance being analyzed. The results are interpreted as concentrations of lead in milligrams per square centimeter. This device is a field-screening tool, used to collect multiple readings in a short period of time. The method of measurement is based on spectrometric analysis of lead x-ray fluorescence within a controlled depth of interrogation. The reading is an estimate of lead content in all layers of paint. The results are displayed in milligrams per square centimeter (mg/cm²). The device(s) used for this inspection were the Thermo Scientific Niton XLp 300A Analyzer(s), Serial number 90719, Source date 3/15/14, Serial number 102951, Source date 9/15/17 and/or Serial number 101094, Source date 2/15/17 Heuresis Corp. Pb200i X-Ray Fluorescence (XRF) Analyzer(s) Serial Number 2104, Source date 1/24/19, Serial number 2231, Source date 4/22/19.

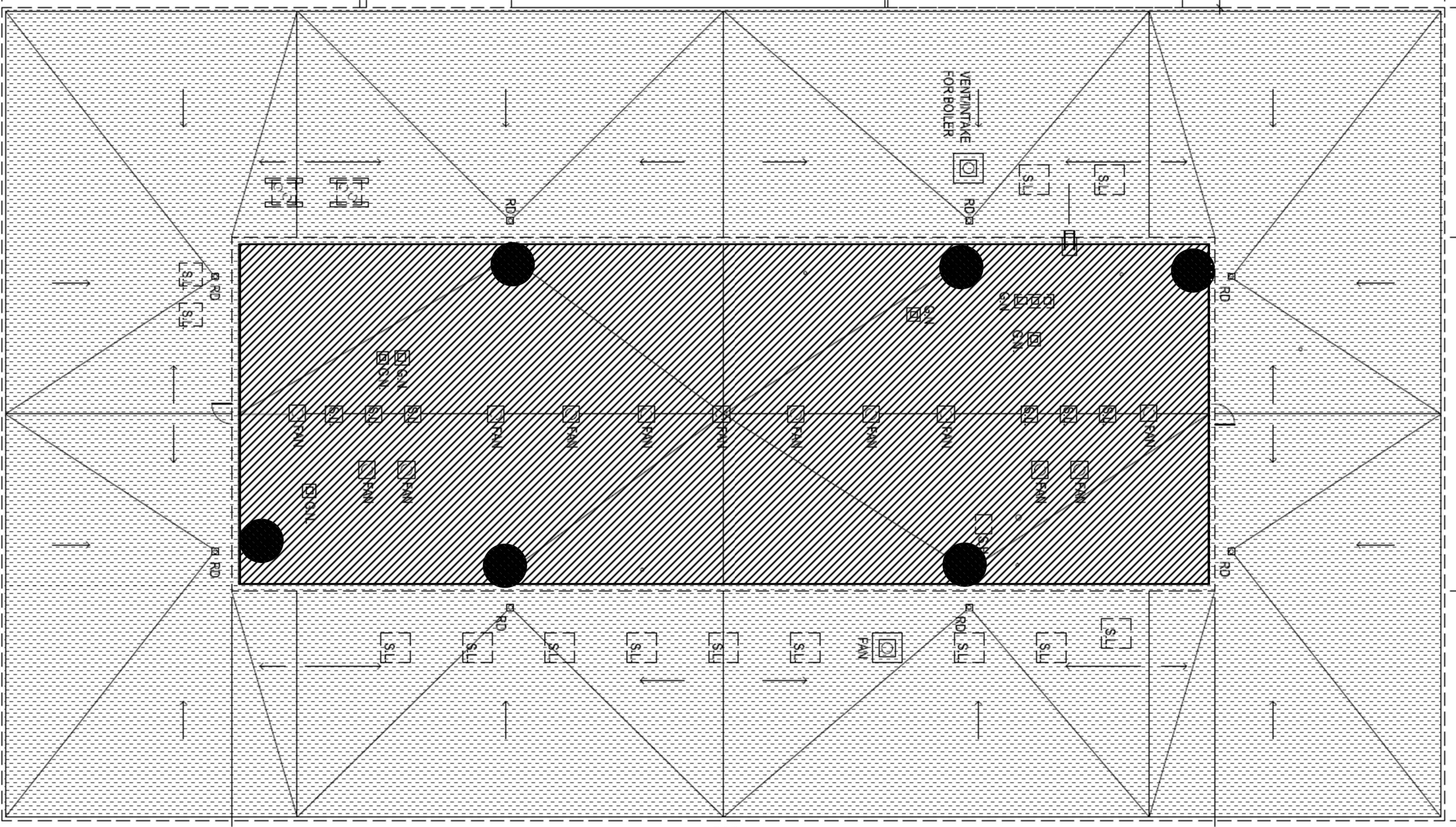
5.0 General Discussion

All construction personnel as well as individuals who have access to locations where asbestos-containing materials (ACM), lead-based paints (LBP) and/or polychlorinated biphenyls (PCB) exists should be informed of its presence and the proper work practices in these areas. Conspicuous labeling of all ACM is suggested to ensure personnel is adequately informed. Personnel should be informed not to rest, lean or store material or equipment on or near these surfaces and not to cut, saw, drill, sand or disturb ACM. All removal, disturbance, and repair of ACM should be performed in compliance with Title 12 NYCRR Part 56 by persons properly trained to handle ACM. Facility custodial and maintenance personnel should receive training commensurate with their work activities; as defined in 29 CFR 1910.1001.

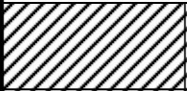
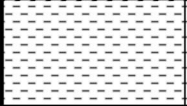
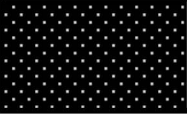
APPENDIX A
ACM LOCATION MAP(S)


Roof Key Plan - ACM Locations

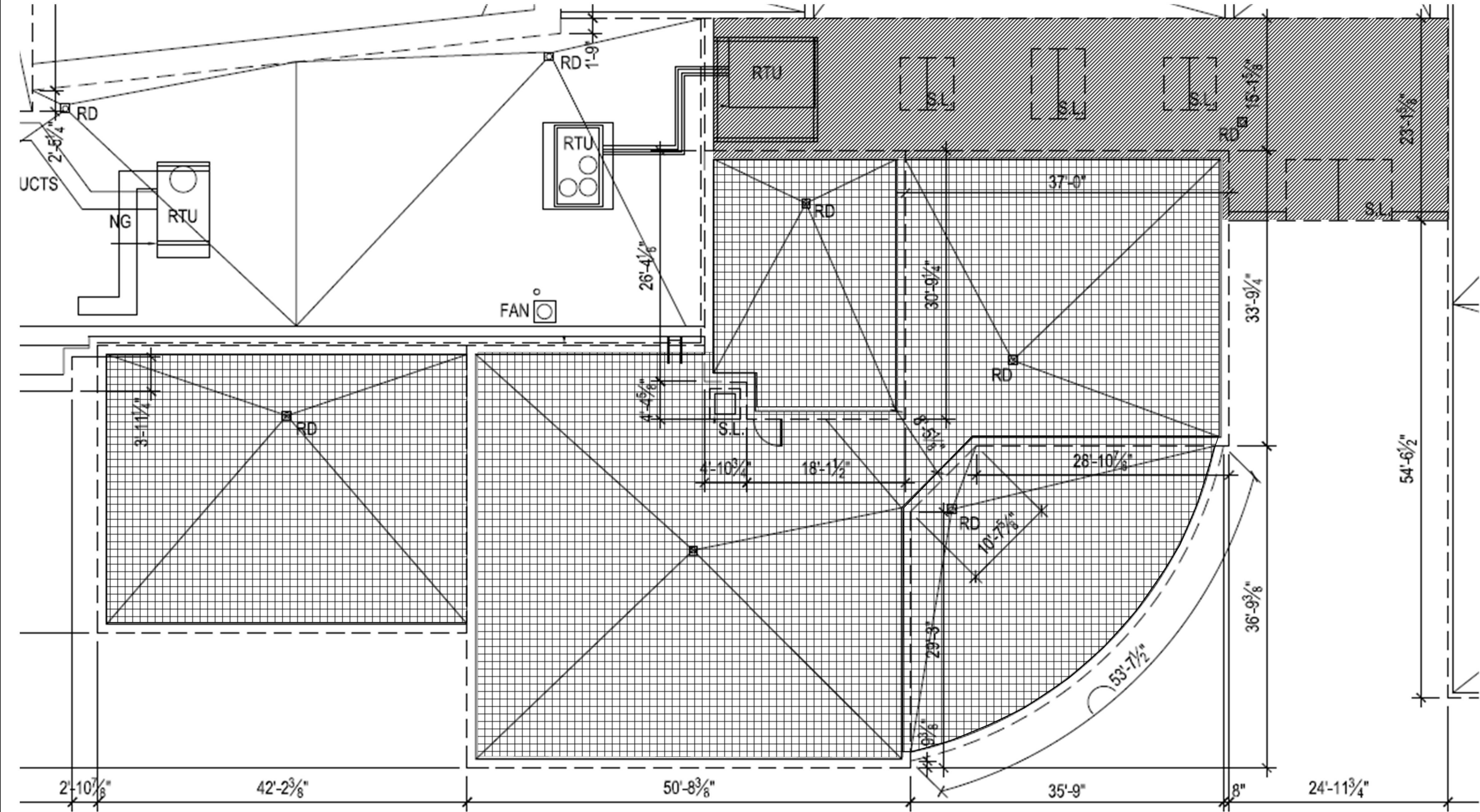
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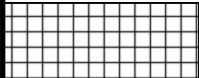

	POSITIVE: Tar at Skylight Curbs and Exhaust Curbs
	POSITIVE: Tar at Wall Sections, Skylight Curbs, Exhaust Curbs and Caulking at Vents/Windows on Copper Siding
	ASSUMED: Roof Drain Mudded Fittings and Pipe Insulation under Roof Deck NOTE: Roof drains are not slated for removal per documentation provided. The scope of work at the drains is to remove the domes and clamps, cleanout the existing bowls and provide a new retrofit drain. Leaving the existing drain bowl in place.

<div><div><div>SUNY New Paltz</div><div>Smiley Art Building</div><div>1 Hawk Drive</div><div>New Paltz, New York 12561</div></div><div><div>MDSzerbaty Associates Architecture</div><div>307 Seventh Avenue, 1501</div><div>New York, New York 10001</div></div></div>	
Client Project No. N/A	
<div><div><div>Adelaide ENVIRONMENTAL HEALTH</div></div><div><div>1511 Route 22</div><div>Brewster, NY 10509</div><div>Phone: (845) 278-7710</div><div>Fax: (845) 278-7750</div></div></div>	
Date: 01/28/2021	Version # 3
Issued For: Asbestos Survey	
Adelaide Project NO. SZER-20115.00-IN	
Drawing Prepared By: David Seddon	
ASB -01	



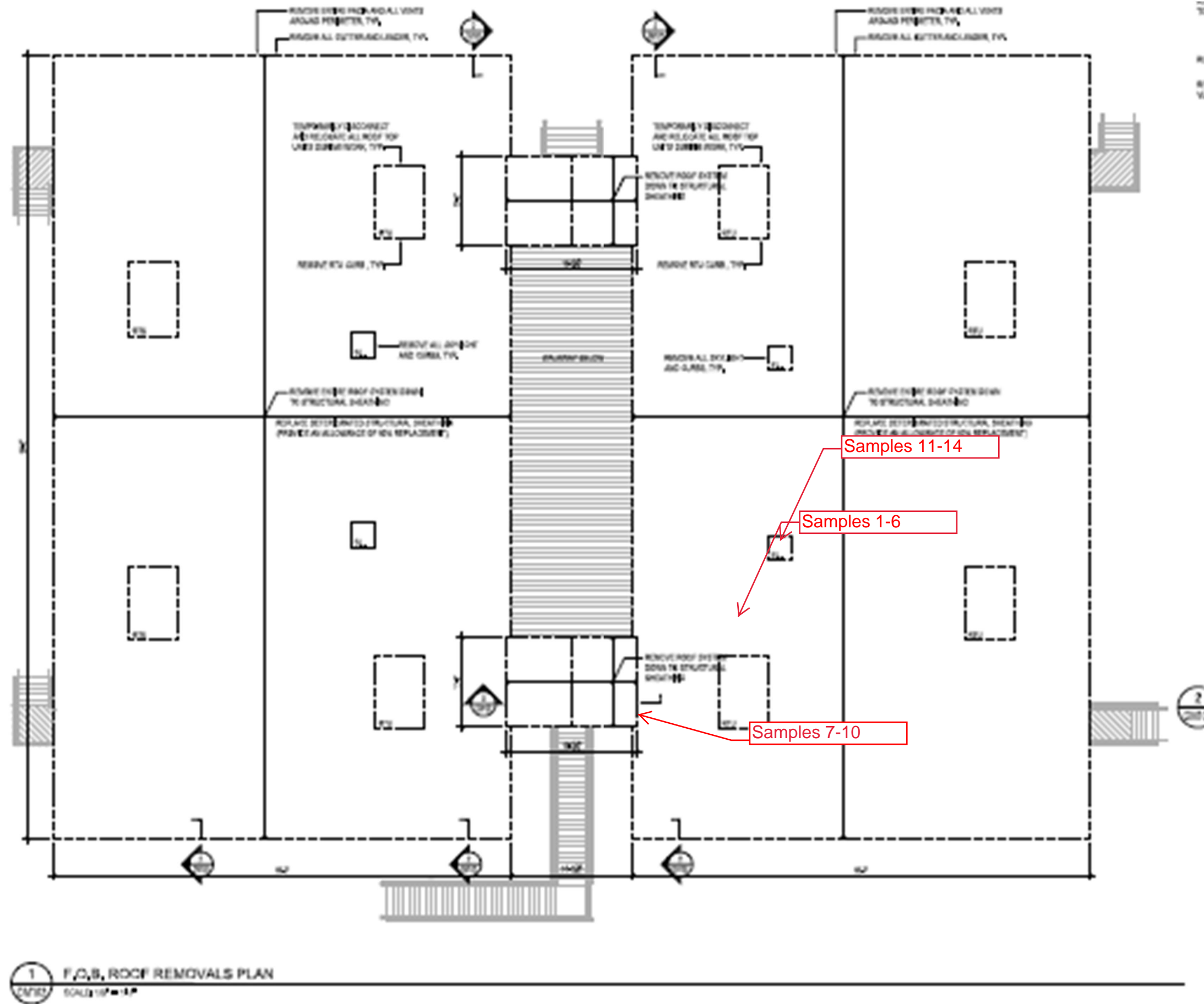
Roof Key Plan - ACM Locations

Drawing Not to Scale

ACM LEGEND: (see report for details)	
	POSITIVE: Tar Wall Sections
	POSITIVE: Tar Wall Sections and RTU Curbs

SUNY New Paltz Museum Building 1 Hawk Drive New Paltz, New York 12561		MDSzerbaty Associates Architecture 307 Seventh Avenue, 1501 New York, New York 10001	
Client Project No. N/A			
 1511 Route 22 Brewster, NY 10509 Phone: (845) 278-7710 Fax: (845) 278-7750			
Date: 01-20-2021	Version # 2	Issued For: Asbestos Survey	Adelaide Project NO. SZER:20115.00-IN
		Drawing Prepared By: David Seddon	
ASB -03			

APPENDIX B
SAMPLE LOCATION MAP(S)



Roof Key Plan - Sample Locations

****Drawing Not to Scale****



Adelaide
ENVIRONMENTAL HEALTH

1511 Route 22
Brewster, NY 10509
Phone: (845) 278-7710
Fax: (845) 278-7750

Date: 01-23-2021
Version # 2

2

Issued For:

Asbestos Survey

Adelaide Project NO.

SZER:20115.00-IN

Drawing Prepared By:

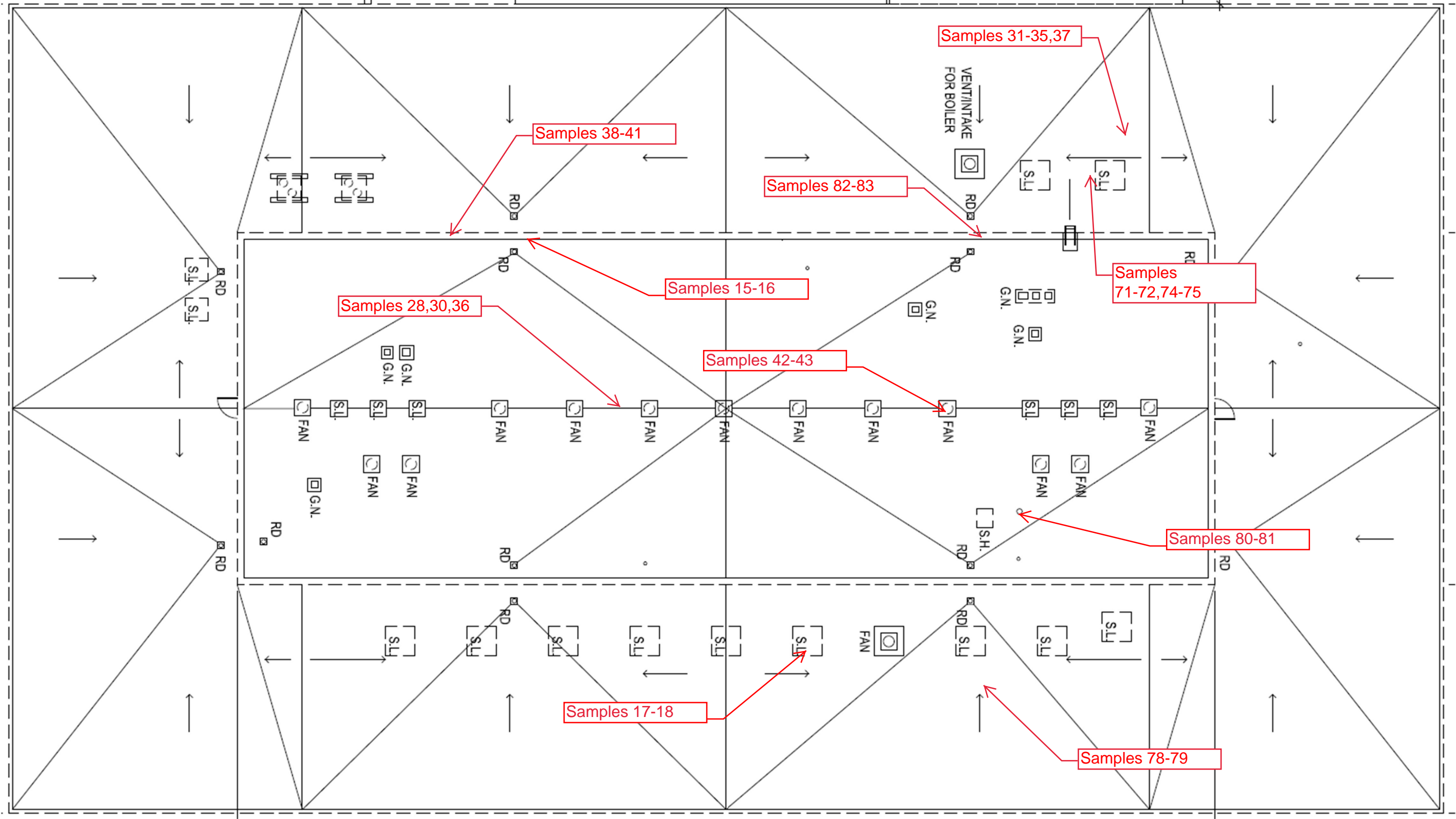
David Seddon

Client Project No.
N/A

SUNY New Paltz
Facilities Office Building
1 Hawk Drive
New Paltz, New York 12561


MDSzrbaty Associates Architecture
307 Seventh Avenue, 1501
New York, New York 10001

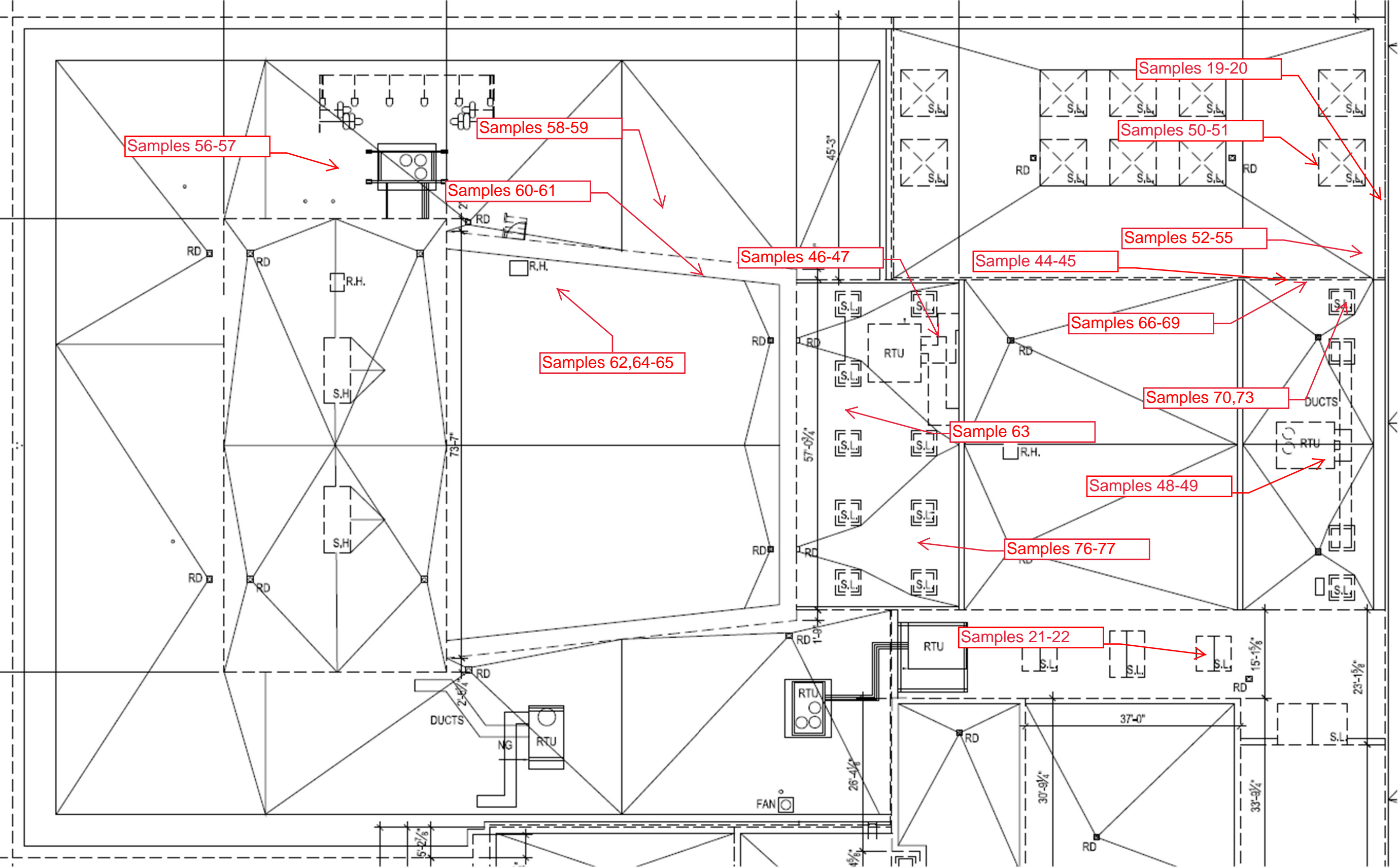
SLM -01



Roof Key Plan - Sample Locations

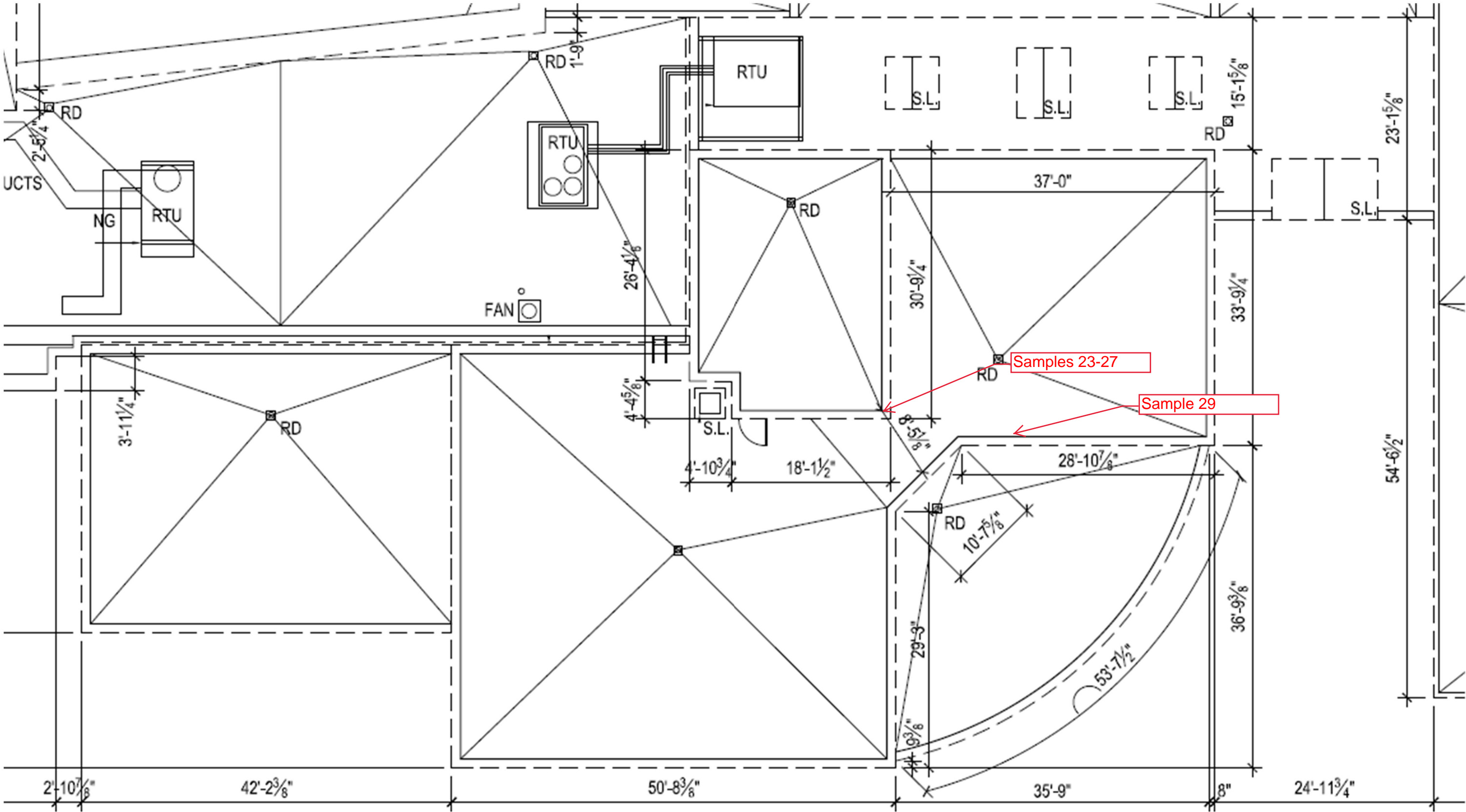
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<div><div>SUNY New Paltz Smiley Art Building 1 Hawk Drive New Paltz, New York 12561</div><div>MDSzerbaty Associates Architecture 307 Seventh Avenue, 1501 New York, New York 10001</div></div>		Client Project No. N/A		<div><div>Adelaide ENVIRONMENTAL HEALTH</div><div>1511 Route 22 Brewster, NY 10509 Phone: (845) 278-7710 Fax: (845) 278-7750</div></div>	Date: 01/23/2021 Version # 2		Issued For: Asbestos Survey		Adelaide Project NO. SZER:20115.00-IN		Drawing Prepared By: David Seddon		SLM -02	
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Roof Key Plan - Sample Locations.
Drawing Not to Scale

<div><div>SUNY New Paltz Theater Building 1 Hawk Drive New Paltz, New York 12561</div><div>MDSzerbaty Associates Architecture 307 Seventh Avenue, 1501 New York, New York 10001</div></div>		Client Project No. N/A		<div><div>Adelaide ENVIRONMENTAL HEALTH</div><div>1511 Route 22 Brewster, NY 10509 Phone: (845) 278-7710 Fax: (845) 278-7750</div></div>	Date: 01/23/2021 Version # 2		Issued For: Asbestos Survey		Adelaide Project NO. SZER-20115.00-IN		Drawing Prepared By: David Seddon		SLM -03	
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Roof Key Plan - Sample Locations

Drawing Not to Scale

<div>SUNY New Paltz Museum Building 1 Hawk Drive New Paltz, New York 12561</div>		<div>MDSzerbaty Associates Architecture 307 Seventh Avenue, 1501 New York, New York 10001</div>	
<div>Client Project No. N/A</div>			
<div><div><div><div><div><div></div><div>Adelaide</div><div>ENVIRONMENTAL HEALTH</div></div></div><div><div>1511 Route 22 Brewster, NY 10509 Phone: (845) 278-7710 Fax: (845) 278-7750</div></div></div></div></div>			
<div>Date: 01/23/2021</div>	<div>Version # 2</div>	<div>Issued For: Asbestos Survey</div>	<div>Adelaide Project NO. SZER:20115.00-IN</div>
		<div>Drawing Prepared By: David Seddon</div>	
<div>SLM -04</div>			

APPENDIX C
ASBESTOS ANALYTICAL RESULTS

Table I
Summary of Bulk Asbestos Analysis Results
 SZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	7	4	0.344	17.9	31.8	50.3	NAD	NAD
Location: Fl. R - Faculty Office Bld. - Peak Roof - Asphalt Shingle								
02	8	4	0.339	18.3	31.6	50.0	NAD	NAD
Location: Fl. R - Faculty Office Bld. - Peak Roof - Asphalt Shingle								
03	9	5	0.185	96.0	2.6	1.4	NAD	NAD
Location: Fl. R - Faculty Office Bld. - Peak Roof - Vapor Barrier								
04	10	5	0.173	96.3	2.7	0.9	NAD	NAD
Location: Fl. R - Faculty Office Bld. - Peak Roof - Vapor Barrier								
05	15	8	0.323	13.3	65.3	16.9	Chrysotile 4.5	NA
Location: Fl. R - Smiley Art Bld. - Caulking @ Vent / Windows & Copper Side								
06	16	8	0.337	37.4	46.2	16.3	NA/PS	NA
Location: Fl. R - Smiley Art Bld. - Caulking @ Vent / Windows & Copper Side								
07	17	9	0.291	35.3	17.8	47.0	NAD	NAD
Location: Fl. R - Smiley Art Bld. - Gray Skylight Sealant								
08	18	9	0.257	45.5	3.5	51.0	NAD	NAD
Location: Fl. R - Smiley Art Bld. - Gray Skylight Sealant								
09	19	20	0.214	62.4	29.1	8.5	NAD	NAD
Location: Fl. R - Theater Bld. - Caulk @ Column & Flashing								
10	20	10	0.214	63.0	29.0	8.0	NAD	NAD
Location: Fl. R - Theater Bld. - Caulk @ Column & Flashing								
11	21	11	0.469	31.6	51.5	17.0	NAD	NAD
Location: Fl. R - Museum - R36 - Black Sealant @ Skylight								
12	22	11	0.391	31.2	51.5	17.3	NAD	NAD
Location: Fl. R - Museum - R36 - Black Sealant @ Skylight								
13	23	12	0.244	52.3	46.1	1.6	NAD	NAD
Location: Fl. R - Museum - R36 - Caulk @ Stucco & Flashing								
14	24	12	0.170	53.2	45.6	1.2	NAD	NAD
Location: Fl. R - Museum - R36 - Caulk @ Stucco & Flashing								
15	34	17	0.242	96.7	1.7	1.6	NAD	NAD
Location: Fl. R - Art Bld. - Tar Layer Between Iso								
16	35	17	0.303	97.2	1.2	1.6	NAD	NAD
Location: Fl. R - Art Bld. - Tar Layer Between Iso								

Client Name: Adelaide Environmental Health

Table I
Summary of Bulk Asbestos Analysis Results
 SZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	42	21	0.239	61.2	3.5	35.3	NAD	NAD
Location: Fl. R - Art Bld. - R1 - Silver Coating on Exh. Units								
18	43	21	0.243	74.6	1.9	23.5	NAD	NAD
Location: Fl. R - Art Bld. - R1 - Silver Coating on Exh. Units								
19	44	22	0.346	52.3	3.8	36.6	Chrysotile 7.3	NA
Location: Fl. R - Museum - R3E / R5 - Tar @ Flashing Seams								
20	45	22	0.284	56.9	4.4	38.7	NA/PS	NA
Location: Fl. R - Museum - R3E / R5 - Tar @ Flashing Seams								
21	48	24	0.189	64.9	32.4	2.7	NAD	NAD
Location: Fl. R - Theater Bld. - R10 - Pitch Pocket Material								
22	49	24	0.292	50.5	47.0	2.5	NAD	NAD
Location: Fl. R - Theater Bld. - R10 - Pitch Pocket Material								
23	50	25	0.261	85.3	3.2	11.5	NAD	NAD
Location: Fl. R - Theater Bld. - R5 - Tar @ Skylight Curb								
24	51	25	0.213	85.6	3.7	10.7	NAD	NAD
Location: Fl. R - Theater Bld. - R5 - Tar @ Skylight Curb								
25	56	28	0.386	63.0	26.2	10.7	NAD	NAD
Location: Fl. R - Theater Bld. - R4 - Main Field Top Layer On LL								
26	57	28	0.441	60.8	30.3	8.9	NAD	NAD
Location: Fl. R - Theater Bld. - R4 - Main Field Top Layer On LL								
27	80	39	0.335	98.9	0.6	0.5	NAD	NAD
Location: Fl. R - Art Bld. - R1 - Vent Pipe Tar								
28	81	39	0.401	83.7	13.3	2.9	NAD	NAD
Location: Fl. R - Art Bld. - R1 - Vent Pipe Tar								

Client Name: Adelaide Environmental Health

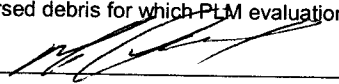
Table I
Summary of Bulk Asbestos Analysis Results
SZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
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Analyzed by: M Peysakhov-Hitachi#747/Noran ; Date Analyzed 1/16/2021

**Quantitative Analysis (Semi/Full); Bulk Asbestos Analysis - PLM by Appd E to Subpt E, 40 CFR 763 or NYSDOH ELAP 198.1 for New York friable samples or NYSDOH ELAP 198.6 for New York NOB samples; TEM (Semi/Full) by EPA 600/R-93/116 (or NYSDOH ELAP 198.4; for New York samples); NAD = no asbestos detected during a quantitative analysis; NA = not analyzed; Trace = <1%; (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only; Qualitative Analysis: Asbestos analysis results of "Present" or "NVA = No Visible Asbestos" represents results for Qualitative PLM or TEM Analysis only (no accreditation coverage available from any regulatory agency for qualitative analyses): NVLAP (PLM) 200546-0, NYSDOH ELAP Lab 11480, AIHA-LAP, LLC (PLM) Lab ID 102843, RI Cert #: AAL-094, CT Cert #: PH-0186, Mass Cert #: AA000054, NJ Cert #: NY-31.

Warning Note: PLM limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris for which PLM evaluation is recommended (i.e. soils and other heterogenous materials).

Reviewed By: 

**AmeriSci New York**

117 EAST 30TH ST.
NEW YORK, NY 10016
TEL: (212) 679-8600 • FAX: (212) 679-3114

PLM Bulk Asbestos Report

Adelaide Environmental Health
Attn: John Soter
1511 Rte. 22 Suite C24

Brewster, NY 10509

Date Received 01/15/21 **AmeriSci Job #** 221011992
Date Examined 01/15/21 **P.O. #**
ELAP # 11480 **Page** 1 of 6
RE: SZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
7 4 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Fibrous glass Trace, Non-fibrous 50.3 %	221011992-01 Location: Fl. R - Faculty Office Bld. - Peak Roof - Asphalt Shingle	No	NAD¹ (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
8 4 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Fibrous glass Trace, Non-fibrous 50 %	221011992-02 Location: Fl. R - Faculty Office Bld. - Peak Roof - Asphalt Shingle	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
9 5 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 1.4 %	221011992-03 Location: Fl. R - Faculty Office Bld. - Peak Roof - Vapor Barrier	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
10 5 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 0.9 %	221011992-04 Location: Fl. R - Faculty Office Bld. - Peak Roof - Vapor Barrier	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
15 8 Analyst Description: Grey/Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Chrysotile 4.5 % Other Material: Non-fibrous 16.9 %	221011992-05 Location: Fl. R - Smiley Art Bld. - Caulking @ Vent / Windows & Copper Side	Yes	4.5 % (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
16 8	221011992-06 Location: Fl. R - Smiley Art Bld. - Caulking @ Vent / Windows & Copper Side		NA/PS
Analyst Description: Bulk Material Asbestos Types: Other Material:			
17 9	221011992-07 Location: Fl. R - Smiley Art Bld. - Gray Skylight Sealant	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Brown, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 47 %			
18 9	221011992-08 Location: Fl. R - Smiley Art Bld. - Gray Skylight Sealant	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Brown, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 51 %			
19 20	221011992-09 Location: Fl. R - Theater Bld. - Caulk @ Column & Flashing	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 8.5 %			
20 10	221011992-10 Location: Fl. R - Theater Bld. - Caulk @ Column & Flashing	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 8 %			
21 11	221011992-11 Location: Fl. R - Museum - R36 - Black Sealant @ Skylight	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 17 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
22 11	221011992-12 Location: Fl. R - Museum - R36 - Black Sealant @ Skylight	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 17.3 %			
23 12	221011992-13 Location: Fl. R - Museum - R36 - Caulk @ Stucco & Flashing	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 1.6 %			
24 12	221011992-14 Location: Fl. R - Museum - R36 - Caulk @ Stucco & Flashing	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Grey, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 1.2 %			
34 17	221011992-15 Location: Fl. R - Art Bld. - Tar Layer Between Iso	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 1.6 %			
35 17	221011992-16 Location: Fl. R - Art Bld. - Tar Layer Between Iso	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 1.6 %			
42 21	221011992-17 Location: Fl. R - Art Bld. - R1 - Silver Coating on Exh. Units	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Silver, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 35.3 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
43 21	221011992-18 Location: Fl. R - Art Bld. - R1 - Silver Coating on Exh. Units	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Silver, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 23.5 %			
44 22	221011992-19 Location: Fl. R - Museum - R3E / R5 - Tar @ Flashing Seams	Yes	7.3 % (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Chrysotile 7.3 % Other Material: Non-fibrous 36.6 %			
45 22	221011992-20 Location: Fl. R - Museum - R3E / R5 - Tar @ Flashing Seams		NA/PS
Analyst Description: Bulk Material Asbestos Types: Other Material:			
48 24	221011992-21 Location: Fl. R - Theater Bld. - R10 - Pitch Pocket Material	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.7 %			
49 24	221011992-22 Location: Fl. R - Theater Bld. - R10 - Pitch Pocket Material	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.5 %			
50 25	221011992-23 Location: Fl. R - Theater Bld. - R5 - Tar @ Skylight Curb	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 11.5 %			

PLM Bulk Asbestos ReportSZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
51 25	221011992-24 Location: Fl. R - Theater Bld. - R5 - Tar @ Skylight Curb	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 10.7 %			
56 28	221011992-25 Location: Fl. R - Theater Bld. - R4 - Main Field Top Layer On LL	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 10.7 %			
57 28	221011992-26 Location: Fl. R - Theater Bld. - R4 - Main Field Top Layer On LL	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 8.9 %			
80 39	221011992-27 Location: Fl. R - Art Bld. - R1 - Vent Pipe Tar	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 0.5 %			
81 39	221011992-28 Location: Fl. R - Art Bld. - R1 - Vent Pipe Tar	No	NAD (by NYS ELAP 198.6) by Jared C. Clarke on 01/15/21
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.9 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos Report

SZER:20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Reporting Notes:

(1) This PLM job was analyzed using Motic BA310 Pol Scope S/N 1190000326

Analyzed by: Jared C. Clarke

*NAD/NSD =no asbestos detected; NA =not analyzed; NA/PS=not analyzed/positive stop, (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; PLM Bulk Asbestos Analysis by Appd E to Subpt E, 40 CFR 763 (NVLAP 200546-0), ELAP PLM Method 198.1 for NY friable samples, which includes the identification and quantitation of vermiculite or ELAP 198.6 for NOB samples or EPA 400 pt ct by EPA 600-M4-82-020 (NY ELAP Lab 11480); Note:PLM is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos-containing in NY State (also see EPA Advisory for floor tile, FR 59,146,38970,8/1/94) National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the lab. This PLM report relates ONLY to the items tested. AIHA-LAP, LLC Lab ID 102843, RI Cert #:AAL-094, CT Cert#: PH-0186, Mass Cert #: AA000054, NJ Cert# NY031.

Reviewed By: _____

END OF REPORT _____

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24
Brewster, NY 10509
845-278-7710
845-278-7750 - fax

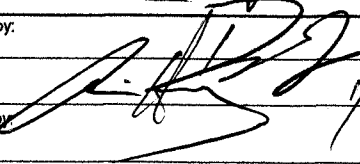

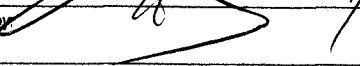

221011992

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Frangible NonFrangible	Condition g, d, sd

7	4		- Peak Roof - Asphalt Shingles					
8	4		- ↓ - b					
9	5		- ↓ - Vapor Barrier					
10	5		- ↓ - b					

Stop at 1st Positive per Homogenous Area
Fax Results to 845-278-7750
E-Mail results to AdelaideLabResults@AdelaideInc.com

24/ hr
TAT

Relinquished by: 
Received by: 
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Received by: 

1/15/2021 11/16

845-278-7750 - fax


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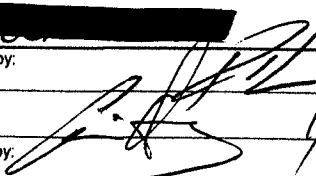
Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Frangible Non-Frangible	Condition g, d, sd
15	8	2	Smiley Art Bld - Caulking @ Vent/Windows : Copper Side					D
16	8		↓ - ↓ ↓ ↓					↓
17	9		↓ - Gray Skylight Sealant					L
18	9		↓ - ↓ ↓					
19	10		THEATER - Caulk @ Column : Flashing					
20	10		↓ - ↓ ↓					
21	11		MUSEUM - R35 - Black Sealant @ Skylight					
22	11		↓ - ↓ - ↓ SEALANT ↓					
23	12		↓ - R36 - Caulk @ Stucco : Flashing					
24	12		↓ - ↓ - ↓ ↓					
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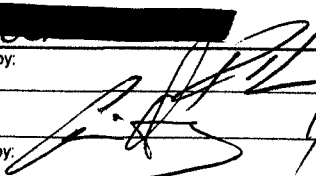
Stop at 1st Positive per Homogenous Area

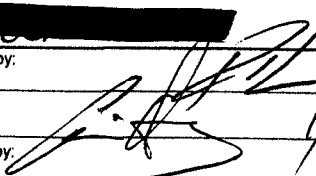
Fax Results to 845-278-7750

E-Mail results to AdelaideLabResults@AdelaideLLC.com

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1/15/2021 1116

Adelaide Environmental Health Associates, Inc

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845-278-7710
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221011992

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon		
1 Hawk Dr							
New Paltz, NY 12561			Project #: SZER: 20115.00-IN		Quantity (In Feet)	Friable NonFriable	Condition g, d, sd
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description				
			<i>MUSEUM</i>				
			<i>[REDACTED]</i>				
			<i>[REDACTED]</i>				
			<i>[REDACTED]</i>				
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42	21		- R1 - Silver Coating on EXH UNITS				
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Stop at 1st Positive per Homogenous Area
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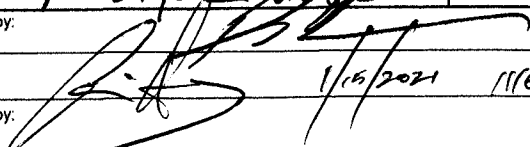

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Brewster, NY 10509

845-278-7710

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221011992

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon		
1 Hawk Dr							
New Paltz, NY 12561			Project #: SZER: 20115.00-IN		Quantity (In Feet)	Friable NonFriable	Condition g. d. sd
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description				
43	21	R	AKT - R1 - Silver Conting on EXH UNIT				
44	22		MUSEUM - R ³ E/R5 - TAL @ FLASHING SEAMS				
45	22		b - b - b b				
46 - 22 - [REDACTED]							
47 - 22 - [REDACTED]							
48	24		- R10 - Pitch Pocket MATERIAL				
49	24		- b - b b				
50	25		- R5 - TAL @ Skylight CAB				
51	25		- - b b				
52 - 25 - [REDACTED]							
53 - 25 - [REDACTED]							
54 - 25 - [REDACTED]							
55 - 25 - [REDACTED]							
56	28	b	- R4 - MAIN FIELD - Top Layer on [REDACTED]				
			Relinquished by:  Received by:  1/15/2021 1116 Relinquished by: Received by:				

Stop at 1st Positive per Homogenous Area

Fax Results to 845-278-7750

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845-278-7710
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22 10 11 992

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- 38 -

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Client Name: Adelaide Environmental Health

Table I
Summary of Bulk Asbestos Analysis Results

SZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
01	1	1	0.147	56.3	30.7	13.0	NAD	NAD
Location: R. Fl. / Faculty Office Building - EPDM Sealant								
02	2	1	0.181	44.4	51.4	4.2	NAD	NAD
Location: R. Fl. / Faculty Office Building - EPDM Sealant								
03	3	2	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Main Roof - Barrier Paper (Brown)								
04	4	2	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Main Roof - Barrier Paper (Brown)								
05	5	3	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Main Roof - Iso Paper								
06	6	3	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Main Roof - Iso Paper								
07	11	6	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Drywall								
08	12	6	---	---	---	---	NAD	NA
Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Drywall								
09	13	7	0.154	69.1	25.7	5.1	NAD	NAD
Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Paper Cover								
10	14	7	0.136	67.9	28.8	3.3	NAD	NAD
Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Paper Cover								
11	25	13	---	---	---	---	NAD	NA
Location: R. Fl. / Museum / R3B - Stucco At Flashing								
12	26	13	---	---	---	---	NAD	NA
Location: R. Fl. / Museum / R3B - Stucco At Flashing								
13	27	13	---	---	---	---	NAD	NA
Location: R. Fl. / Museum / R3B - Stucco At Flashing								
14	28	14	---	---	---	---	NAD	NA
Location: R. Fl. / Art Bldg. / R1 - Dens Deck								
15	29	14	---	---	---	---	NAD	NA
Location: R. Fl. / Museum / RBB - Dens Deck								
16	30	15	0.198	56.0	29.6	14.4	NAD	NAD
Location: R. Fl. / Art / R1 - EPDM Sealant								

Client Name: Adelaide Environmental Health

Table I
Summary of Bulk Asbestos Analysis Results
 SZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
17	31	15	0.222	57.1	29.5	13.4	NAD	NAD
Location: R. Fl. / Art / R2 - EPDM Sealant								
18	32	16	----	----	----	----	NAD	NA
Location: R. Fl. / Art / R2 - Iso Paper								
19	33	16	----	----	----	----	NAD	NA
Location: R. Fl. / Art / R2 - Iso Paper								
20	36	18	0.280	96.8	1.2	2.1	NAD	NAD
Location: R. Fl. / Art Bldg. / R1 - Bottom Layer								
21	37	18	0.232	65.6	15.4	19.0	NAD	NAD
Location: R. Fl. / Art Bldg. / R2 - Bottom Layer								
22	38	19	----	----	----	----	NAD	NA
Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Paper (Brown)								
23	39	19	----	----	----	----	NAD	NA
Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Paper (Brown)								
24	40	20	0.184	95.5	1.7	2.7	NAD	NAD
Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Tar Paper								
25	41	20	0.302	95.7	1.5	2.8	NAD	NAD
Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Tar Paper								
26	46	23	0.187	92.1	7.4	0.5	NAD	NAD
Location: R. Fl. / Theater - HVAC Duct Wrap								
27	47	23	0.282	91.9	6.1	2.1	NAD	NAD
Location: R. Fl. / Theater - HVAC Duct Wrap								
28	52	26	0.395	65.4	14.3	20.3	NAD	NAD
Location: R. Fl. / Theater / R5 / Main Field - Bur								
29	53	26	0.421	64.8	14.9	20.3	NAD	NAD
Location: R. Fl. / Theater / R5 / Main Field - Bur								
30	54	27	0.350	4.7	11.7	83.6	NAD	NAD
Location: R. Fl. / Theater / R5 - Tar On Concrete Deck								
31	55	27	0.127	78.7	7.6	13.7	NAD	NAD
Location: R. Fl. / Theater / R5 - Tar On Concrete Deck								
32	58	29	0.217	63.2	19.0	17.8	NAD	NAD
Location: R. Fl. / Theater / R4 - Bottom Layer								

See Reporting notes on last page

Client Name: Adelaide Environmental Health

Table I
Summary of Bulk Asbestos Analysis Results
 SZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

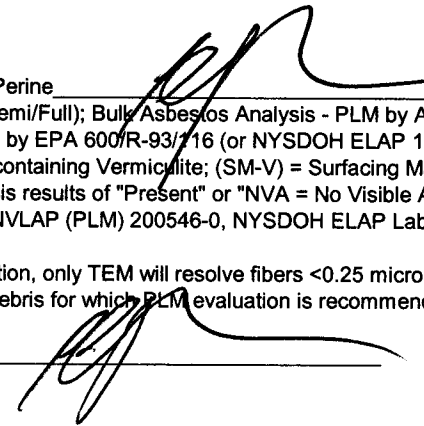
AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
33	59	29	0.241	65.8	19.9	14.3	NAD	NAD
Location: R. Fl. / Theater / R4 - Bottom Layer								
34	60	30	0.341	58.2	9.7	26.5	Chrysotile 5.6	NA
Location: R. Fl. / Theater / R4 - Tar At Wall								
35	61	30	0.525	56.6	8.2	35.1	NA/PS	NA
Location: R. Fl. / Theater / R4 - Tar At Wall								
36	62	31	0.329	60.9	18.6	20.5	NAD	NAD
Location: R. Fl. / Theater / R7 - Layered Paper								
37	63	31	0.234	64.7	18.0	17.3	NAD	NAD
Location: R. Fl. / Theater / R8 - Layered Paper								
38	64	32	----	----	----	----	NAD	NA
Location: R. Fl. / Theater / R7 - Tectum Roof Deck								
39	65	32	----	----	----	----	NAD	NA
Location: R. Fl. / Theater / R7 - Tectum Roof Deck								
40	66	33	0.268	59.7	24.9	15.4	NAD	NAD
Location: R. Fl. / Theater / R10 - Water Barrier At Edge								
41	67	33	0.239	60.9	22.5	16.7	NAD	NAD
Location: R. Fl. / Theater / R10 - Water Barrier At Edge								
42	68	34	0.297	90.2	3.5	6.3	NAD	NAD
Location: R. Fl. / Theater / R10 - Tar At Edge Of Transition Wall								
43	69	34	0.164	80.7	10.5	8.8	NAD	NAD
Location: R. Fl. / Theater / R10 - Tar At Edge Of Transition Wall								
44	70	35	----	----	----	----	NAD	NA
Location: R. Fl. / Theater / At Hallway - Ceiling Plaster (Top Coat)								
45	71	35	----	----	----	----	NAD	NA
Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Top Coat)								
46	72	35	----	----	----	----	NAD	NA
Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Top Coat)								
47	73	36	----	----	----	----	NAD	NA
Location: R. Fl. / Theater / Hallway - Ceiling Plaster (Base Coat)								
48	74	36	----	----	----	----	NAD	NA
Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Base Coat)								

See Reporting notes on last page

Client Name: Adelaide Environmental Health

Table I
Summary of Bulk Asbestos Analysis Results
 SZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

AmeriSci Sample #	Client Sample#	HG Area	Sample Weight (gram)	Heat Sensitive Organic %	Acid Soluble Inorganic %	Insoluble Non-Asbestos Inorganic %	** Asbestos % by PLM/DS	** Asbestos % by TEM
49	75	36	----	----	----	----	NAD	NA
Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Base Coat)								
50	76	37	0.162	15.4	48.6	36.0	NAD	NAD
Location: R. Fl. / Theater / Hallway - 2 x 2 Ceiling Tile								
51	77	37	0.170	15.4	48.8	35.8	NAD	NAD
Location: R. Fl. / Theater / Hallway - 2 x 2 Ceiling Tile								
52	78	38	0.128	18.7	78.6	2.7	NAD	NAD
Location: R. Fl. / Theater / Hallway - 1 x 1 Ceiling Tile (Spline)								
53	79	38	0.155	17.0	76.7	6.3	NAD	NAD
Location: R. Fl. / Art / Rm. 222 - 1 x 1 Ceiling Tile (Spline)								
54	82	40	0.333	52.8	10.5	30.6	Chrysotile 6.1	NA
Location: R. Fl. / Art / R2 - Tar At Wall								
55	83	40	0.313	55.4	7.9	36.7	NA/PS	NA
Location: R. Fl. / Art / R2 - Tar At Wall								

 Analyzed by: Khaalid W. Perine ; Date Analyzed 4/23/2020 *Hitachi #600/Worn*

**Quantitative Analysis (Semi/Full); Bulk Asbestos Analysis - PLM by Appd E to Subpt E, 40 CFR 763 or NYSDOH ELAP 198.1 for New York friable samples or NYSDOH ELAP 198.6 for New York NOB samples; TEM (Semi/Full) by EPA 600/R-93/116 (or NYSDOH ELAP 198.4; for New York samples); NAD = no asbestos detected during a quantitative analysis; NA = not analyzed; Trace = <1%; (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; Quantitation for beginning weights of <0.1 grams should be considered as qualitative only; Qualitative Analysis: Asbestos analysis results of "Present" or "NVA = No Visible Asbestos" represents results for Qualitative PLM or TEM Analysis only (no accreditation coverage available from any regulatory agency for qualitative analyses); NVLAP (PLM) 200546-0, NYSDOH ELAP Lab 11480, AIHA-LAP, LLC (PLM) Lab ID 102843.

Warning Note: PLM limitation, only TEM will resolve fibers <0.25 micrometers in diameter. TEM bulk analysis is representative of the fine grained matrix material and may not be representative of non-uniformly dispersed debris for which PLM evaluation is recommended (i.e. soils and other heterogenous materials).

 Reviewed By: 

**AmeriSci New York**

117 EAST 30TH ST.
NEW YORK, NY 10016
TEL: (212) 679-8600 • FAX: (212) 679-3114

PLM Bulk Asbestos Report

Adelaide Environmental Health
Attn: John Soter
1511 Rte. 22 Suite C24

Brewster, NY 10509

Date Received 04/22/20 **AmeriSci Job #** 220042147
Date Examined 04/22/20 **P.O. #**
ELAP # 11480 **Page** 1 of 12
RE: SZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz, NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
1 1 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 13 %	220042147-01 Location: R. Fl. / Faculty Office Building - EPDM Sealant	No	NAD ¹ (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
2 1 Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 4.2 %	220042147-02 Location: R. Fl. / Faculty Office Building - EPDM Sealant	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
3 2 Analyst Description: Brown, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 99 %, Non-fibrous 1 %	220042147-03 Location: R. Fl. / Faculty Office Building / Main Roof - Barrier Paper (Brown)	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
4 2 Analyst Description: Brown, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 98 %, Fibrous glass Trace, Non-fibrous 2 %	220042147-04 Location: R. Fl. / Faculty Office Building / Main Roof - Barrier Paper (Brown)	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
5 3	220042147-05 Location: R. Fl. / Faculty Office Building / Main Roof - Iso Paper	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 95 %, Non-fibrous 5 %			
6 3	220042147-06 Location: R. Fl. / Faculty Office Building / Main Roof - Iso Paper	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 90 %, Non-fibrous 10 %			
11 6	220042147-07 Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Drywall	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Fibrous glass 2 %, Non-fibrous 98 %			
12 6	220042147-08 Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Drywall	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White/Brown, Heterogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 10 %, Fibrous glass 2 %, Non-fibrous 88 %			
13 7	220042147-09 Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Paper Cover	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 5.1 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
14 7	220042147-10 Location: R. Fl. / Faculty Office Building / Hallway At Skylight - Paper Cover	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 3.3 %			
25 13	220042147-11 Location: R. Fl. / Museum / R3B - Stucco At Flashing	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Fibrous glass 2 %, Non-fibrous 98 %			
26 13	220042147-12 Location: R. Fl. / Museum / R3B - Stucco At Flashing	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Fibrous glass Trace, Non-fibrous 100 %			
27 13	220042147-13 Location: R. Fl. / Museum / R3B - Stucco At Flashing	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Fibrous glass Trace, Non-fibrous 100 %			
28 14	220042147-14 Location: R. Fl. / Art Bldg. / R1 - Dens Deck	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: OffWhite, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Fibrous glass 10 %, Non-fibrous 90 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
29 14	220042147-15 Location: R. Fl. / Museum / RBB - Dens Deck	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Fibrous glass 5 %, Non-fibrous 95 %			
30 15	220042147-16 Location: R. Fl. / Art / R1 - EPDM Sealant	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 14.4 %			
31 15	220042147-17 Location: R. Fl. / Art / R2 - EPDM Sealant	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 13.4 %			
32 16	220042147-18 Location: R. Fl. / Art / R2 - Iso Paper	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 90 %, Non-fibrous 10 %			
33 16	220042147-19 Location: R. Fl. / Art / R2 - Iso Paper	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 90 %, Non-fibrous 10 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
36 18	220042147-20 Location: R. Fl. / Art Bldg. / R1 - Bottom Layer	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.1 %			
37 18	220042147-21 Location: R. Fl. / Art Bldg. / R2 - Bottom Layer	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 19 %			
38 19	220042147-22 Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Paper (Brown)	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Brown, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 99 %, Non-fibrous 1 %			
39 19	220042147-23 Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Paper (Brown)	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Brown, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 99 %, Non-fibrous 1 %			
40 20	220042147-24 Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Tar Paper	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.7 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
41 20	220042147-25 Location: R. Fl. / Art Bldg. / R2 / At Copper Cover - Tar Paper	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.8 %			
46 23	220042147-26 Location: R. Fl. / Theater - HVAC Duct Wrap	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Silver/Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 0.5 %			
47 23	220042147-27 Location: R. Fl. / Theater - HVAC Duct Wrap	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Silver/Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.1 %			
52 26	220042147-28 Location: R. Fl. / Theater / R5 / Main Field - Bur	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 20.3 %			
53 26	220042147-29 Location: R. Fl. / Theater / R5 / Main Field - Bur	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 20.3 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
54 27	220042147-30 Location: R. Fl. / Theater / R5 - Tar On Concrete Deck	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 83.6 %			
55 27	220042147-31 Location: R. Fl. / Theater / R5 - Tar On Concrete Deck	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 13.7 %			
58 29	220042147-32 Location: R. Fl. / Theater / R4 - Bottom Layer	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 17.8 %			
59 29	220042147-33 Location: R. Fl. / Theater / R4 - Bottom Layer	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 14.3 %			
60 30	220042147-34 Location: R. Fl. / Theater / R4 - Tar At Wall	Yes	5.6 % (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Chrysotile 5.6 % Other Material: Non-fibrous 26.5 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
61 30	220042147-35 Location: R. Fl. / Theater / R4 - Tar At Wall		NA/PS
Analyst Description: Bulk Material Asbestos Types: Other Material:			
62 31	220042147-36 Location: R. Fl. / Theater / R7 - Layered Paper	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 20.5 %			
63 31	220042147-37 Location: R. Fl. / Theater / R8 - Layered Paper	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 17.3 %			
64 32	220042147-38 Location: R. Fl. / Theater / R7 - Tectum Roof Deck	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Beige, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 20 %, Non-fibrous 80 %			
65 32	220042147-39 Location: R. Fl. / Theater / R7 - Tectum Roof Deck	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Beige, Homogeneous, Fibrous, Bulk Material Asbestos Types: Other Material: Cellulose 20 %, Non-fibrous 80 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
66 33	220042147-40 Location: R. Fl. / Theater / R10 - Water Barrier At Edge	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 15.4 %			
67 33	220042147-41 Location: R. Fl. / Theater / R10 - Water Barrier At Edge	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 16.7 %			
68 34	220042147-42 Location: R. Fl. / Theater / R10 - Tar At Edge Of Transition Wall	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 6.3 %			
69 34	220042147-43 Location: R. Fl. / Theater / R10 - Tar At Edge Of Transition Wall	No	NAD (by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 8.8 %			
70 35	220042147-44 Location: R. Fl. / Theater / At Hallway - Ceiling Plaster (Top Coat)	No	NAD (by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
71	220042147-45	No	NAD
35	Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Top Coat)		(by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			
72	220042147-46	No	NAD
35	Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Top Coat)		(by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: White, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			
73	220042147-47	No	NAD
36	Location: R. Fl. / Theater / Hallway - Ceiling Plaster (Base Coat)		(by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			
74	220042147-48	No	NAD
36	Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Base Coat)		(by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			
75	220042147-49	No	NAD
36	Location: R. Fl. / Art / Rm. 204 - Ceiling Plaster (Base Coat)		(by NYS ELAP 198.1) by Kensen Caro on 04/22/20
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Bulk Material Asbestos Types: Other Material: Non-fibrous 100 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
76	220042147-50	No	NAD
37	Location: R. Fl. / Theater / Hallway - 2 x 2 Ceiling Tile		(by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: OffWhite, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 36 %			
77	220042147-51	No	NAD
37	Location: R. Fl. / Theater / Hallway - 2 x 2 Ceiling Tile		(by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: OffWhite, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 35.8 %			
78	220042147-52	No	NAD
38	Location: R. Fl. / Theater / Hallway - 1 x 1 Ceiling Tile (Spline)		(by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: OffWhite, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 2.7 %			
79	220042147-53	No	NAD
38	Location: R. Fl. / Art / Rm. 222 - 1 x 1 Ceiling Tile (Spline)		(by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: OffWhite, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Other Material: Non-fibrous 6.3 %			
82	220042147-54	Yes	6.1 %
40	Location: R. Fl. / Art / R2 - Tar At Wall		(by NYS ELAP 198.6) by Kensen Caro on 04/22/20
Analyst Description: Black, Homogeneous, Non-Fibrous, Bulk Material Asbestos Types: Chrysotile 6.1 % Other Material: Non-fibrous 30.6 %			

Client Name: Adelaide Environmental Health

PLM Bulk Asbestos ReportSZER: 20115.00-IN; SUNY New Paltz; 1 Hawk Dr., New Paltz,
NY 12561

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
83	220042147-55		NA/PS
40	Location: R. Fl. / Art / R2 - Tar At Wall		

Analyst Description: Bulk Material

Asbestos Types:

Other Material:

Reporting Notes:

(1) This PLM job was analyzed using Motic BA310 Pol Scope S/N 1190000538

Analyzed by: Kensen Caro

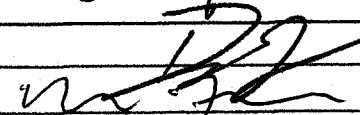
*NAD/NSD =no asbestos detected; NA =not analyzed; NA/PS=not analyzed/positive stop, (SOF-V) = Sprayed On Fireproofing containing Vermiculite; (SM-V) = Surfacing Material containing Vermiculite; PLM Bulk Asbestos Analysis by Appd E to Subpt E, 40 CFR 763 (NVLAP 200546-0), ELAP PLM Method 198.1 for NY friable samples, which includes the identification and quantitation of vermiculite or ELAP 198.6 for NOB samples or EPA 400 pt ct by EPA 600-M4-82-020 (NY ELAP Lab 11480); Note:PLM is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non asbestos-containing in NY State (also see EPA Advisory for floor tile, FR 59,146,38970,8/1/94) National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the lab. This PLM report relates ONLY to the items tested. AIHA-LAP, LLC Lab ID 102843, RI Cert AAL-094, CT Cert PH-0186, Mass Cert AA000054.

Reviewed By: _____ END OF REPORT _____

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24
Brewster, NY 10509
845-278-7710
845-278-7750 - fax

220042147

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon		
1 Hawk Dr							
New Paltz, NY 12561			Project #: SZER: 20115.00-IN		Quantity (in Feet)	Frangible NonFrangible	Condition S, d, sd
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description				
1	1	R	Facility Office Building - EPDM Sealant				
2	1						
3	2		Main Roof - Brown Barrier Paper				
4	2						
5	3		Iso Paper				
6	3						
7							
8							
9							
10							
11	6		Hallway e Skylight - Drywall				
12	6						
13	7		Paper Case				D
14	7						b
Stop at 1st Positive per Homogenous Area			Relinquished by:				
Fax Results to 845-278-7750			Received by: 				
E-Mail results to AdelaideLabResults@AdelaideInc.com			Relinquished by:				
			Received by:				

24 hr
TAT

4/22/2010

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24

Brewster, NY 10509

845-278-7710

845-278-7750 - fax

220042147

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Frangible Non-Frangible	Condition g. d. sd
15	0	1	Only in front of building - 1st floor - 1st floor					
16	0	1	Only in front of building - 1st floor - 1st floor					
17	1	1	Only in front of building - 1st floor - 1st floor					
18	1	1	Only in front of building - 1st floor - 1st floor					
19	1	1	Only in front of building - 1st floor - 1st floor					
20	1	1	Only in front of building - 1st floor - 1st floor					
21	1	1	Only in front of building - 1st floor - 1st floor					
22	1	1	Only in front of building - 1st floor - 1st floor					
23	1	1	Only in front of building - 1st floor - 1st floor					
24	1	1	Only in front of building - 1st floor - 1st floor					
25	13		-	-	Stucco @ Flashing			
26	13		-	-				
27	13		-	-				
28	14	4	ART Bld - @R1 - Dens Deck					

Stop at 1st Positive per Homogenous Area

Fax Results to 845-278-7750

E-Mail results to AdelaideLabResults@Adelaideehc.com

LSh

TAT

Relinquished by: *[Signature]*

Received by: *[Signature]*

Relinquished by:

Received by:

4/22/20 1014

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24

Brewster, NY 10509

845-278-7710

845-278-7750 - fax

220042147

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Frangible Non-Frangible	Condition g, d, sd
			MUSEUM					
29	14	R	ART - R3B- DENS DECK					f
30	15		ART - R1 - EPDM SEALANT					
31	15		- R2 - b b					
32	16		- R2 - Iso Paper					
33	16		- b					

36	18		- R1 - Bottom Layer					
37	18		- R2 - b b					
38	19		- @ Copper Cover - Brown Paper					
39	19		- b					
40	20		- Tan Paper					
41	20		- b					

Stop at 1st Positive per Homogenous Area Fax Results to 845-278-7750 E-Mail results to AdelaideLabResults@AdelaideInc.com			14/2 TAT			Relinquished by: _____ Received by: _____ Relinquished by: _____ Received by: _____		

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24

Brewster, NY 10509

845-278-7710

845-278-7750 - fax

220042147

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Friable Non-Friable	Condition g, d, sd
43	21	1	...					
44	21	1	...					
45	21	1	...					
46	23		Theater - HVAC Duct wrap					
47	23		↓ - ↓					
48	21	1	...					
49	21	1	...					
50	21	1	...					
51	21	1	...					
52	26		- MAIN FIELD - BUR					
53	26		- ↓ - ↓					
54	27		- TAR ON CONCRETE DECK					
55	27		↓ - ↓					
56	21	1	...					
			24/4 TAT					
Stop at 1st Positive per Homogenous Area			Relinquished by: <i>[Signature]</i>					
Fax Results to 845-278-7750			Received by: <i>[Signature]</i>			4/22/20 1016		
E-Mail results to AdelaideLabResults@AdelaideInc.com			Relinquished by:					
			Received by:					

845-278-7750 - fax

Site Address: SUNY New Paltz			Date: 04/06-07/2020			Inspector(s) David Seddon					
1 Hawk Dr											
New Paltz, NY 12561			Project #: SZER: 20115.00-IN								
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description						Quantity (In Feet)	Flammable Non-Flammable	Condition g, d, sd
58	29		-	-	-	-	-	-	-	-	-
59	29		-	-	-	-	-	-	-	-	-
60	30		-	-	-	-	-	-	-	-	-
61	30		-	-	-	-	-	-	-	-	-
62	31		-	-	-	-	-	-	-	-	-
63	31		-	-	-	-	-	-	-	-	-
64	32		-	-	-	-	-	-	-	-	-
65	32		-	-	-	-	-	-	-	-	-
66	33		-	-	-	-	-	-	-	-	-
67	33		-	-	-	-	-	-	-	-	-
68	34		-	-	-	-	-	-	-	-	-
69	34		-	-	-	-	-	-	-	-	-

op at 1st Positive per Homogenous Area

x Results to 845-278-7750

Mail results to Adelaidelabresults@Adelaidelc.com

246

TAT

Relinquished by: *[Signature]*

Received by: *[Signature]* 4/22/20 1016

Relinquished by:

Received by:

Adelaide Environmental Health Associates, Inc

1511 Rte. 22, Suite C24
Brewster, NY 10509
845-278-7710
845-278-7750 - fax

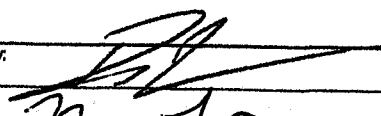
220042147


2200421

Site Address: SUNY New Paltz			Date: 04/06-07/2020		Inspector(s) David Seddon			
1 Hawk Dr								
New Paltz, NY 12561			Project #: SZER: 20115.00-IN					
Sample ID #	Homogeneous Area	Floor Level	Sample Location/Description			Quantity (In Feet)	Frangible NonFrangible	Condition g. d. sd
70	35	R	Theater - @ Hallway - Plastic Coig - Top Coat					✓
71	35		ART - Rm 204 -					
72	35		b - b -					
73	36		Theater - Hallway -					
74	36		ART - Rm 204 -					
75	36		b - b -					
76	37		Theater - Hallway - 2X2 Coig Tile					
77	37		b - b -					
78	38		b - b - 1K1 spline Coig Tile					
79	38		ART - Rm 202 -					
80	39		ART - Rm 202 -					
81	40		ART - Rm 202 -					
82	40		- R2 - Top @ wall					
83	40		- b -					

Stop at 1st Positive per Homogenous Area
Fax Results to 845-278-7750
E-Mail results to AdelaideLabResults@AdelaideInc.com

24/6
TAT

Relinquished by: 

Received by:  4/22/20 1016

Relinquished by:

Received by:

APPENDIX D
XRF READINGS

Reading #	Date	Time	Job Number	Job Name	Space Type	Floor	Room	Component	Side	Substrate	Color	Condition	Lead Concentration	Units	Result	Inspector Name
1	4/8/2020	13:56:16	20115	SUNY New Paltz	School		Calibrate						1.1	mg/cm2	Positive	David Seddon
2	4/8/2020	13:56:31	20115	SUNY New Paltz	School		Calibrate						0.9	mg/cm2	Negative	David Seddon
3	4/8/2020	13:56:46	20115	SUNY New Paltz	School		Calibrate						1.1	mg/cm2	Positive	David Seddon
4	4/8/2020	13:57:43	20115	SUNY New Paltz	School	1st Floor	Hallway	Ceiling	Ceiling	Plaster	White	Good	0.3	mg/cm2	Negative	David Seddon
5	4/8/2020	13:57:55	20115	SUNY New Paltz	School	2nd Floor	222	Ceiling	Ceiling	Plaster	White	Good	0.1	mg/cm2	Negative	David Seddon
6	4/8/2020	13:58:10	20115	SUNY New Paltz	School		Calibrate						1	mg/cm2	Positive	David Seddon
7	4/8/2020	13:58:26	20115	SUNY New Paltz	School		Calibrate						0.9	mg/cm2	Negative	David Seddon
8	4/8/2020	13:58:33	20115	SUNY New Paltz	School		Calibrate						1.1	mg/cm2	Positive	David Seddon

APPENDIX E
PERSONNEL AND LABORATORY CERTIFICATIONS

New York State – Department of Labor

Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

Adelaide Environmental Health Associates, Inc.
Suite C24
1511 Route 22
Brewster, NY 10509

FILE NUMBER: 99-0656
LICENSE NUMBER: 29305
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 07/18/2019
EXPIRATION DATE: 07/31/2020

Duly Authorized Representative – John Soter:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.



Eileen M. Franko, Director
For the Commissioner of Labor

United States Environmental Protection Agency

This is to certify that



Adelaide Environmental Health Associates, Inc

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint renovation, repair, and painting activities pursuant to 40 CFR Part 745.89

In the Jurisdiction of:

All EPA Administered States, Tribes, and Territories

This certification is valid from the date of issuance and expires December 05, 2022

NAT-15081-2

Certification #

June 21, 2017

Issued On



A handwritten signature in black ink that reads "Michelle Price".

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



DAVID W SEDDON

CLASS(EXPIRES)

C ATEC(12/20) D INSP(12/20)

E MGPL(12/20) H PM (12/20)

CERT# 09-08546
DMV# 879533539

MUST BE CARRIED ON ASBESTOS PROJECTS



01213 005237458 40

EYES BRO

HAIR BRO

HGT 5' 10"

IF FOUND RETURN TO:

NYS DOL - L&C UNIT

ROOM 161A BUILDING 12

STATE OFFICE CAMPUS

ALBANY NY 12240

United States Environmental Protection Agency

This is to certify that



David W Seddon

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires September 19, 2020

LBP-I-101120-1

Certification #

July 05, 2017

Issued On



John Gorman, Chief

Pesticides & Toxic Substances Branch

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. PAUL J. MUCHA
AMERICA SCIENCE TEAM NEW YORK, INC
117 EAST 30TH ST
NEW YORK, NY 10016

NY Lab Id No: 11480

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:*

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual

Serial No.: 59674

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

SECTION 02 83 13 - LEAD REMEDIATION

Tests results are bound at the end of this section and indicate that paint, soil and/or other existing materials contain lead and a probable leachable lead content of greater than 5ppm.

- a. The Contractor shall remove, contain, capture, collect and dispose of the lead containing materials in compliance with all current and pending Federal and State regulations, including the Environmental Protection Agency (EPA), the Resource Conservation and Recovery Act (RCRA), the Hazardous and Solid Waste Amendment (HSWA) the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Occupational Safety and Health Administration (OSHA), and especially 29 CFR 1926 for protection of workers.
- b. The Contractor shall bear responsibility for insuring that the waste is properly handled at each stage of operation and properly stored in approved containers. The Campus shall be the generator of the waste, and shall supply its EPA I.D. number and address for use in filling out the manifests. The Contractor shall be responsible for the preparation of the manifest (information and tracking form) to be signed by all applicable parties. The Contractor shall allow two weeks for the Campus to review and sign the completed manifests.
- c. The Contractor shall hire an environmental or chemical testing laboratory, accredited by the State of New York, as legally required to sample and test the waste in accordance with EPA method 1311, Toxicity Characteristic Leaching Procedure (TCLP).
- d. Waste classified as hazardous shall be shipped off site for treatment, treated on site, or recovered and reused in compliance with Federal and State regulations. Obtain all applicable permits. Provide certification of disposal to the campus.
- e. All work areas involving demolition, cutting, modification, etc., to any existing materials shall be considered a lead hazard area per 29 CFR 1926 for the protection of workers unless the contractor removes the potential sources of air borne lead.

SECTION 03 73 50
CONCRETE ROOF FILL AND SCREED REPAIR WORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide labor, materials, equipment, services to provide for the repair of concrete roof fill/screed, to add new fill to ensure minimum slope towards the drains, and to raise door saddles with fast setting manufactured repair mortar as indicated on drawings; as required for completed work and as specified herein.
- B. The bid amount of fill and screed to be repaired **is indicated on the Drawings**. Any amount above or below this quantity shall be considered an extra or credit.

1.02 RELATED SECTIONS

- A. Selective Demolitions and Removals.....Section 02 07 00
- B. Thermoplastic Polyolefin
Roofing.....Section 07 54 23
- C. Flashing and Sheet Metal.....Section 07 60 00
- D. Sheet Metal Roofing.....Section 07 61 00

1.03 REFERENCE STANDARDS

References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. ASTM International (ASTM)
- B. Steel Structures Painting Council (SSPC)

1. "Hand Tool Cleaning - SP2"
 2. "Power Tool Cleaning - SP3"
- C. International Concrete Restoration Institute (ICRI)

1.04 SUBMITTALS

A. Product Data

Provide manufacturer's information on the bonding agent and repair mortar, including application instructions and specifications.

B. Quality Control Submittals

1. Certificates:

- a. Furnish manufacturer's certification that materials meet or exceed Specification requirements.
- b. Manufacturer's training certificate: Furnish letter from manufacturer stating personnel performing work have been instructed on the proper usage of the material.

2. Repair Procedure: Furnish written description of repair procedures and operations sequencing based on manufacturer's requirements prior to commencing the Work.

3. Manufacturer's Field Reports: Submit field report from manufacturer of repair mortar indicating areas of surface preparation and mortar placement inspected.

4. Contractor Qualifications

Provide proof of Installer and Manufacturer qualifications specified under "Quality Assurance".

5. Mock-up: Provide mock-ups as indicated under Quality Assurance.

1.05 QUALITY ASSURANCE**A. Qualifications**

1. Installer: Company specializing in the Work of this Section shall have a minimum of three years experience and at least two projects with similar quantity of materials. Contractor shall be trained by the repair mortar manufacturer and shall have a certificate of training on file from the manufacturer.
2. Manufacturer: Company specializing in the manufacture of concrete repair mortars to be used in this Contract shall have a minimum of five years experience.

B. Manufacturer's Representative

All work of this Section shall be performed under the overall supervision of the repair material manufacturer's representative. The representative shall attend pre-construction meetings to instruct the contractor on the proper usage of the material and to make regular visits during the course of construction to ensure that surface preparation and method of installation is acceptable.

C. Job Mockups

Prior to performing the work of this Section, prepare a sample panel of not less than 12 sq. ft. of concrete repair work, including a separate mock-up of the surface preparation. For formed repairs, provide mockup of pour to ensure that material will be properly vibrated and finish will be without voids. Do not proceed further with the work until the Authority's representative has approved the sample panel. Sample shall be a portion of the area to be restored and may be kept if approved.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Materials specified shall be delivered to the site in sealed, properly labeled containers. Containers shall

indicate manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).

- B. Keep containers tightly closed when not in use. Comply with manufacturer's printed instructions for storing and protecting materials.
- C. Do not store liquid material in hot sun. Keep material from freezing.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply if the temperature is below 50°F or above 85°F unless the material manufacturer is consulted for recommendations. Follow hot-weather and cold-weather practices as recommended by ACI 305R and 306R respectively.
- B. Do not use frozen materials or materials coated with ice or frost.
- C. Do not apply when there is expectation of rain within 24 hours.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Sto Concrete Restoration Div., Atlanta, GA 30331
- B. Sika Corp, Lyndhurst, NJ 07071
- C. Mapei Corp, Deerfield Beach, FL 33442
- D. Master Builders, Inc., Cleveland, OH

2.02 MATERIALS

- A. Repair Mortar
 - 1. Material shall be of high strength capable of receiving a vapor barrier/vent base sheet within 6 hours @ 72°F after installation (ie. will no longer

emit water vapor from the drying process after 6 hours). Material shall be capable of being extended with the use of 3/8" aggregate.

- a. Minimum compressive strength of 4,000 psi in 28 days when tested in accordance with ASTM C109.
- b. Minimum slant bond strength of 2,500 psi in 7 days when tested in accordance with ASTM C882.
- c. Minimum flexural strength of 1000 psi in 7 days when tested in accordance with ASTM C348 or ASTM C78.
- d. Rapid Chloride permeability of less than 1000 coulombs when tested in accordance with AASHTO T277/ASTM C1202.

2. Repair mortar shall be:

- a. "Sto Rapid Repair Mortar" by Sto Concrete Restoration Division
- b. "SikaQuick 1000" by Sika Restoration
- c. "Planitop 18 ES" by Mapei
- d. "EMACO T415 or T430" by Master Builders

B. Bonding Agent

1. Corrosion-inhibiting, epoxy/acrylic resin, protective coating for steel reinforcing bars and bonding agent that will not form a vapor barrier or bond break with the repair mortar with the following properties:
 - a. Bond strength of 1800 psi in 2 hours when tested in accordance with ASTM C882.
 - b. Flexural strength of 2000 psi in 28 days when tested in accordance with ASTM C78.

- c. Tensile strength of 800 psi in 28 days when tested in accordance with ASTM C190.
- 2. Bonding Agent shall be:
 - a. "Sto Bonding and Anti-corrosion Agent" by Sto Concrete Restoration Division
 - b. "Armotec 110" by Sika Corporation
 - c. "Planibond 3C" by Mapei
- C. Miscellaneous Materials
 - 1. Water: Potable water, ASTM C94
 - 2. Epoxy paste adhesive: ASTM C882
 - 3. Coarse aggregate: Clean, washed crushed No. 8 stone, 3/8" maximum size, conforming to ASTM C33.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine all adjoining work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Authority any condition that prevents the performance of this Work.

3.02 PROTECTION, REMOVALS, AND PREPARATION

- A. Protection

Protect adjacent surfaces not to be restored. Protect sills, ledges, and projections from material droppings.

- B. Removals and Surface Preparation

- 1. Remove damaged and weak concrete fill and screed as well as all loose and foreign material. Chip substrate by bush hammering or other mechanical means acceptable to the repair concrete/mortar manufacturer to obtain a minimum surface profile of

ICRI CSP 4. At cinder fill areas, remove immediately loose material on the surface. Thickness of material and perimeter of repair shall be a minimum of 1/4" in depth. Feather edging is not permitted.

2. Do not damage the existing structure during removal of the existing material. Any damage to the slab or areas below shall be repaired/replaced at no cost to the Authority.

3.03 REPAIR MORTAR APPLICATION

- A. Mix structural repair concrete in accordance with manufacturer's instruction. Follow time limits set by manufacturer to prevent hardening of material prior to placement. Working time of material is approximately 45 minutes @ 70°F.
- B. Prior to application of material, thoroughly saturate concrete surface with water. Remove any standing water prior to patching. On cinder fill, lightly wet the substrate.
- C. Apply a scrub coat of the repair material of proportions determined by manufacturer (indicate in written repair procedure). While still damp, apply repair mortar. Do not retemper scrub coat. As an alternate, apply manufacturer's recommended bonding agent. Apply to dry concrete surface using a stiff bristle brush. Brush in well to ensure continuous coverage. Apply in two coats of approximately 10 mils each or as per manufacturer's latest recommendations. Allow to dry a minimum of 30-45 minutes between coats or repair concrete/mortar application. However, apply repair material within 24 hours after last coating. If 24-hour period elapses, reapply bonding agent and allow to dry as above.
- D. Pour or trowel repair mortar onto area to be repaired or repitched until it is to the same level and at the same pitch (if adequate) as the surrounding slab or to the new required pitch. Darby and float surface. Leave surface free from depressions, bulges, rough spots, and other defects. For applications over 1/2" (and required for

those over 1"), extend material with the addition of 55% clean pea gravel, 3/8" in size.

3.04 CURING

- A. As soon as surface of patch has hardened, cure patch a minimum of 48 hours by applying water-based acrylic curing compounds conforming to ASTM C309 or C1315, misting, wet burlap, etc. For patches to be covered with other material, only use curing compounds acceptable to the finish material manufacturer, unless the compound is removed prior to placing the finish material in a manner acceptable to the finish manufacturer.
- B. Follow manufacturer's latest recommendations for any other recommendations. The curing provision of A above shall not be waved unless manufacturer does not permit it.

3.05 PROTECTION AND CLEANING

- A. Clean all adjacent areas of excess material and clean all floors and walls of powder and droppings. Remove misplaced materials from surfaces immediately.
- B. Protect material from freezing and from rainfall prior to final set.

3.06 FIELD QUALITY CONTROL

- A. The Authority will inspect surfaces and reject any that contain cracks or other defects. The repair will be tested for soundness and structural integrity. Any defective areas shall be fixed at Contractor's expense.
- B. Engage the services of the material manufacturer's representative to inspect the surface preparation, instruct in the proper usage of the material and to inspect the work throughout the project. Pay for all required fees.

END OF SECTION

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data:	_____	_____
1. Bonding agent		
2. Repair concrete/mortar		
Certificates:	_____	_____
1. Material certification		
2. Training certificate		
Procedure:	_____	_____
1. Detailed written repair procedure		
Reports:	_____	_____
1. Manufacturer's written field reports.		
Qualifications	_____	_____
1. Installer		
2. Manufacturer		
Mock Up:	_____	_____
1. Surface Preparation		
2. Repair		

* * *

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide metal fabrications and miscellaneous metals as indicated on the Drawings and as specified herein, including, but not limited to the following:

1. I-Beam, channel, angle, and other miscellaneous iron work
2. Steel ladders
3. Steel pipe railings and handrails
4. Miscellaneous bolts, anchors and inserts to be set in concrete

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION (NOT USED)

1.03 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

B. ASTM International (ASTM), latest standards

C. American Welding Society (AWS).

D. American National Standards Institute (ANSI)

E. Society for Protective Coatings (SSPC)

F. Federal Specifications (FS)

G. National Association of Architectural Metals Manufacturers (NAAMM)

H. Aluminum Association (AA)

I. The Building Code of the City of New York, latest edition.

J. The American Galvanizers Association

1.04 DESIGN REQUIREMENTS

A. Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand not less than the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections as per Section BC 1607.7 of the 2014 NYC Building Code. Apply each load to produce the maximum stress in each respective component of each metal fabrication. In cases where local requirements are more stringent they shall apply. Where railings support fixtures or other imposed loads, allowance shall be made for the additional loads.

1. Handrails

- a. Uniform load of 50 lb/ft applied in any direction at the top and to transfer this load to the supports.
- b. Concentrated load of 200 pounds applied in any direction at any point and to transfer the load to the supports.
- c. The uniform and concentrated loads need not be assumed to act concurrently.

2. Top Rail of Guardrail Systems

- a. Uniform load of 50 lb/ft applied in any direction at the top and to transfer the load to the supports.
- b. Concentrated load of 200 pounds applied in any direction at any point and to transfer the load to the supports.
- c. The uniform and concentrated loads need not be assumed to act concurrently.

3. Infill of Rail Systems: panels, balusters, intermediate railings, and other elements composing the infill area must resist the following combination loading. Reactions due to this combination loading are not required to be applied simultaneously with one another and are not required to be superimposed with those in paragraphs 1 and 2 above.

- a. A concentrated normal load of 50 pounds applied horizontally on an area of 1 ft², including openings and spaces between rails.
 - b. A vertically downward load of 50 lb/ft applied at the most critical locations.
 - c. A concentrated upward load of 50 pounds applied at the most critical location.
4. Heavy Duty Metal Bar Gratings: Capable of withstanding a uniform load of 250 psf or a concentrated load of 8,000 pounds, whichever produces the greater stress. Provide heavy duty gratings except where light duty gratings are indicated.
 5. Light Duty Metal Bar Gratings: Capable of withstanding a uniform load of 75 psf, or a concentrated load of 2,000 pounds, whichever produces the greater stress.

1.05 SUBMITTALS

A. Product Data, for each item specified.

1. Submit product data sheets for products used in metal fabrications, including anchoring devices. Instructions for installation of anchorage devices built into other work.
2. Submit product data sheets for painting materials.
3. Submit product data sheets for grouts and sealants.

B. Shop Drawings, for each item specified.

1. Show all locations, markings, quantities, materials, sizes and shapes.
2. Indicate all methods of connecting, anchoring, fastening, bracing and attaching to work of other trades.

C. Calculations

1. Where metal fabrications are required to comply with certain design loadings, submit structural design, structural calculations, materials properties, and other information needed for structural analysis, signed and sealed by the New York State licensed Professional Engineer responsible for their preparation.

D. Samples

Where specified, submit samples of fabricated items, hardware, and finishes for selection.

- E. Welder certificates signed by the Contractor certifying that welders comply with requirements specified under Article titled "Quality Assurance".

- F. Qualification data for firms and persons specified in Article titled "Quality Assurance" to demonstrate their capabilities and experience.

1. Provide proof of Zinc Metallizer's qualifications specified under "Quality Assurance"; certification of qualifications meeting Military Standard by one of the following:

- a. A branch of the U.S. Dept. of Defense (DoD), or

- b. A company certified by U.S. Dept. of Defense; submit DoD certification for this company, or

- c. The Society for Protective Coatings (SSPC).

2. Hot Dip Galvanizer/Powder Coating Applicator: Provide proof of Galvanizer/Applicator's qualifications by submittal of the following:

- 1) Galvanizer's written Quality Control/Quality Assurance manual for hot dip galvanizing and factory applied coatings.

- 2) Certification from the American Galvanizers Association that Galvanizer has completed all course requirements and is a certified Master Galvanizer.

G. Test Reports

Submit test reports for zinc metallizing or hot dip galvanizing and coating system as specified herein, paragraph titled "Galvanizing by the Zinc Metallizing Process; or Hot Dip Galvanizing; with Finish Coating".

H. Warranty

Warranty as specified herein.

1.06 QUALITY ASSURANCE

- A. Items provided in this Section shall be manufactured and fabricated by firms experienced in the type of Work specified.
- B. Installation shall be by installers experienced in the type of Work specified for the respective item. Installer shall be acceptable to the manufacturer.
- C. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel", D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code - Aluminum".
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- D. Engineer Qualifications: Professional engineer licensed to practice in jurisdiction where project is located and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this project.
- E. Zinc metallizer: The company or individual responsible for application of zinc metallizing shall be certified as qualified to perform this process by one of the following:
 - 1. Certification in accordance with Mil Std 1687 by a branch of the U.S. Dept. of Defense, or by a company that is certified by the Dept. of Defense in accordance with **this** military standard.
 - 2. Thermal Spray Certification by The Society for Protective Coatings (SSPC).

The firm providing the zinc metallizing shall also perform the painting of the members at the shop also to provide a single source responsibility.

F. Hot-Dip Galvanizer/Powder Coating Applicator: The company or individual responsible for application of hot dip galvanizing with a powder coat finish shall be certified as qualified to perform this process by the following:

1. Certification from the American Galvanizers Association that Galvanizer has completed all course requirements and is a certified Master Galvanizer.
2. Certification from the manufacturer of the powder coatings that the galvanizer is an approved applicator of said manufacturer's material and meets all application and performance criteria.

1.07 PRODUCT HANDLING

- A. Before shipment to the job, all finishes shall be adequately protected for transporting and erecting periods.
- B. Replace damaged items, with the approval of the Project Architect, and at no additional cost to the Authority.

1.08 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress and work of other trades to avoid delay of work.

1.09 WARRANTY

- A. Warranty for metal fabrication items with galvanizing by zinc metallizing or hot dip galvanizing, and finish coated with epoxy paint system or powder coat system: The coating applicator's/Contractor's warranty that items shall not show signs of rust, and finish shall be fully warranted against peeling, cracking, crazing, blistering, chalking and fading for a period of 5 years from date of installation of products. If rusting or failure of coating occurs, new items shall be provided or coating shall be refurbished in the

shop. Warranty includes labor to remove and replace the items.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metals

1. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
2. Ferrous Metals
 - a. Steel Plates, Shapes, and Bars: ASTM A36
 - b. Rolled Steel Floor Plates: ASTM A786
 - c. Steel Bars for Gratings: ASTM A1011 or ASTM A36
 - d. Wire Rod for Grating Cross Bars: ASTM A510
 - e. Cold-Formed Steel Tubing: ASTM A500
 - f. Hot-formed Steel Tubing: ASTM A501
 - g. Hot-Rolled Steel Sheet: ASTM A1011
 - h. Cold-Rolled Steel Sheet: ASTM A1008
 - i. Galvanized Steel Sheet: ASTM A653
 - J. Steel Pipe: ASTM A53; finish, type, and weight class as follows:
 - a) Black finish, unless otherwise indicated.
 - b) Galvanized finish for exterior installations and where indicated.
 - c) Type S, Grade A, standard weight (schedule 40), unless otherwise indicated, or another grade or weight or both required by structural loads.
 - k. Gray Iron Castings: ASTM A48, Class 30
 - l. Malleable Iron Castings: ASTM A47, Grade 32510

- m. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
 - n. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.
 - 1) "Peerless Wedge", Manufactured by "Peerless Hardware Manufacturing Co., Inc.
 - o. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.
 - p. Stainless Steel bar: ASTM A276, Type 304
 - q. Stainless Steel plate: ASTM A240, Type 304.
3. Aluminum
- a. Extruded Bars and Shapes: ASTM B221, alloy as follows:
 - 1) 6061-T6 or 6063-T6 for bearing bars of gratings and shapes.
 - 2) 6061-T1 for grating cross bars.
 - b. Aluminum-Alloy Rolled Tread Plate: ASTM B632, alloys as follows:
 - 1) 6061-T6 for platforms.
 - 2) 6061-T4 for treads.
 - c. Aluminum Sheet for Expanded Aluminum Grating: ASTM B209, alloy 5052-H32.
 - d. Fasteners for Aluminum Gratings: Use fasteners made of same basic metal as fastened metal except use galvanized fasteners complying with ASTM A153 for exterior aluminum units, unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.

4. Bronze

- a. Detectable Warnings: 1/4" thick, with integral cast anchors, cast-in abrasive and raised truncated domes conforming to requirements of Americans with Disabilities Act.

1): Safe-T-Metal Co., Garden City Park, N.Y.
or equal.

B. Grout and Anchoring Cement

1. Nonshrink Metallic Grout: Premixed, factory-packaged, ferrous aggregate grout complying with Federal Specification CE CRD-C 621 specifically recommended by manufacturer for heavy-duty loading applications of type specified in this section.
2. Nonshrink Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, non-gaseous grout complying with Federal Specification CE CRD-C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
3. Erosion-Resistant Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by manufacturer.
4. Products: Subject to compliance with requirements, provide one of the following:
 - a. Nonshrink Metallic Grouts:

"Hi Flow Grout", Euclid Chemical Co.
"MasterFlow 885", Master Builders
"Met-ox", ChemMasters Specialty Construction Products
 - b. Nonshrink Nonmetallic Grouts:

"Euco N-S Grout", Euclid Chemical Co.

"Crystex", L & M Construction Chemicals, Inc.

"Masterflow 713", Master Builders

"Five Star Grout", Five Star.

c. Erosion-Resistant Anchoring Cement:

"Super Por-Rok", CMP Specialty Products, A division of CGM inc.

C. Fasteners

1. General: Provide galvanized or type 304/316 SS fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A
3. Lag Bolts: Square head type, ANSI B18.2.1
4. Machine Screws: Cadmium plated steel, FS FF-S-92C
5. Drilled-In Expansion Anchors: Anchors installed in concrete shall have current ICC-ES listing for performance in cracked concrete as per Section BC 1912.
6. Toggle Bolts: Tumble-wing type, type, class, and style as required.
7. Lock Washers: Helical spring type carbon steel, FS FF-W-84A
8. Vandal resistant fasteners: Torx with pin, or as otherwise indicated. Corrosion resistant.

D. Paint

1. Shop Primer, interior Work: Acrylic rust-inhibitive type containing no lead equal to Tnemec 115 Unibond or Carboline Carbocrylic 3358. Paint must meet SCAQMD standards for VOC emissions.
2. Shop Primer, exterior Work except galvanized items: primer for epoxy coat system as specified in Section 09900-Painting.
3. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

E. Galvanizing by the Hot-dip Method - No Finish Coating

Items indicated to be painted shall not be hot-dip galvanized except as specified herein.

1. Galvanize structural shapes in accordance with ASTM A123.
2. Galvanize hardware in accordance with ASTM A153.
3. Galvanizing repair paint for regalvanizing welds and damaged areas shall conform to ASTM A780 and comply with Military Specification MIL-P-21035B, such as ZRC Cold Galvanizing Compound.

F. Galvanizing by the Zinc Metallizing Process or Hot Dip Galvanizing; and Finish Coating

1. Zinc/aluminum metallizing (referred to herein as zinc metallizing) is the process of thermally applying an 85/15 zinc-aluminum wire over the surface of steel.
2. Zinc metallizing or hot dip galvanizing, and finish coating system shall have the following performance characteristics and results of tests performed on representative samples. Finish coating for metallizing shall be either epoxy coating system or powder coating. Finish coating for hot dip galvanizing shall be powder coating (See paragraph 3 below for acceptable system):
 - a. Adhesion: Test zinc metallizing/hot dip galvanizing with complete finish coating (epoxy coating system or powder coating system) in accordance with ASTM D4541, Test Method E. Pull-off strength throughout the system shall be not less than 750 psi before and after environmental cycling.

Environmental cycling shall be 10 cycles of the following: 4 hrs at 100% humidity per ASTM D1735; 16 hours below 0°F; and 4 hours at 140°F.
 - b. Corrosion resistance of zinc metallizing/hot dip galvanizing with epoxy coat system or powder coating: A rating of 10 after 1000 hours salt fog (prohesion method) when tested in accordance with ASTM D1654, Procedure A. Scribe shall be cut through

all coatings to bare steel substrate. Expose specimens in accordance with ASTM G85.

- c. Powder coating complying with the following ASTM standards:

Adhesion: ASTM D3359, no loss.
Hardness: ASTM D3363 (pencil), H min.
Falling Sand: ASTM D968 20L/mil.
Salt Spray: ASTM B117, passes 3000 hrs.
Humidity: ASTM D2247, 3000 hours, few #8 blisters.
Impact Resistance (3mm): ASTM D2794, no loss.
Color Retention: ASTM D2244, 5-year less than or equal to 5 delta E.
Chalk Resistance: ASTM D4214, #8 rating.
Gloss Retention: ASTM D523, greater than or equal to 30 percent retention.
Erosion Resistance: ASTM B244, less than 10 percent film loss.
Compliance: AAMA 2604.

3. Hot Dip Galvanizing with Powder Coating Finish

- a. As a system equivalent to zinc metallizing, it is permitted to use the Duncan Colorgalv Thermoset process of hot dip galvanizing with powder coat finish. Galvanizing coating thickness grade per ASTM A123 shall be 100, with DFT mil thickness coating not less than 3.6 to 3.9 mils.
- b. Powder coating thickness shall be as specified in this specification. Coating shall include an architectural grade primer.

4. Galvanizing repair paint for regalvanizing welds and damaged areas shall conform to ASTM A780 and comply with Military Specification MIL-P-21035B, such as ZRC Cold Galvanizing Compound.

2.02 FINISHES

A. General

1. Comply with NAAM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
2. Finish metal fabrications after assembly.

3. Refer to Articles 2.04 and 2.05 for painting and galvanizing.

B. Aluminum Finishes

1. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
 - a. As Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).
 - b. Class 1 Clear Anodized Finish: AA-M12C22A41 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class I Architectural: clear film thicker than 0.7 mil) complying with AAMA 607.1.

2.03 FABRICATIONS

A. General

1. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
3. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

Temperature Change (Range): 180°F

4. Shear and punch metals cleanly and accurately. Remove burrs.

5. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
6. Remove sharp or rough areas on exposed traffic surfaces.
7. Weld corners and seams continuously to comply with AWS recommendations and the following:
 - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - b. Obtain fusion without undercut or overlap.
 - c. Remove welding flux immediately.
 - d. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
8. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flathead (countersunk) screws or bolts. Locate joints where least conspicuous.
9. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
10. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
11. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.

12. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

B. Support Inserts

1. Provide "Peerless Wedge" hot-dip galvanized inserts for anchorage to concrete at locations shown on the Drawings, or as required. Wedge inserts shall be provided with a 3/4" bolt, nut, and washers, all hot-dip galvanized. Install 3/4" diameter reinforcing bar X 1'-6" minimum length through anchor loop to increase anchorage in concrete. Space inserts 2'-6" on centers (maximum) starting 6" from face of masonry opening. Submit three (3) samples for approval. Shims shall be square horseshoe shape, hot-dip galvanized, as indicated on the Drawings.

C. Apparatus Supports, Miscellaneous Hangers and Accessories

1. Provide bolts, stud bolts, for all proprietary bolts and fasteners for the support of apparatus and other items as indicated on the Drawings. Secure to steel beams or concrete floor slabs above. Where exposed to view in interior, provide finish paint in addition to shop paint.

D. I-Beam, Channel, Angle, T-Framing, and Miscellaneous Iron Work

All ferrous metal items described in this Paragraph shall be galvanized if located in kitchen areas, in exterior wall or roof construction, or if exposed to the exterior. Where exposed to view, also provide finish paint as specified herein - powder coating or epoxy coating system. Interior items shall receive shop and finish paint.

1. Provide all I-beams, channels, angles, T's, bent plates, steel plates, bent angle frames and all other miscellaneous iron work as indicated on the Drawings, except framing forming a part of the structural steel work. Drill all holes required to secure metal, wood and other materials to the framing.
2. Provide all clip angles required for anchoring wood blocking at gravel stops. Secure clip angles, of sizes and spacing indicated on the Drawings, to concrete with threaded bolts;

furnish bolts at proper time for setting in concrete. Drill clips to receive bolts for anchoring wood blocking in place.

E. Steel Ladder

1. General: Fabricate ladders for the locations shown, with dimensions, spacings, details and anchorages as indicated. Comply with requirements of ANSI A14.3.
2. Side Rails: Continuous steel flat bars, 3/8" inch x 2½ inches, with eased edges, spaced 18 inches apart.
3. Bar Rungs: Round steel bars, 3/4 inch diameter, spaced 12 inches o.c.
4. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.
5. Support each ladder at top and bottom and at intermediate points spaced not more than 5'-0" o.c. by means of welded or bolted steel brackets.
 - a. Size brackets to support ladder securely and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
 - b. Extend side rails 42 inches above top rung, and return rails to wall or structure unless other secure handholds are provided.
 - c. If the adjacent structure does not extend above the top rung, goose-neck the extended rails back to the structure to provide secure ladder access.
6. Provide nonslip surface on top of each rung, either by coating the rung with aluminum oxide granules set in epoxy resin adhesive, or by using a type of manufactured rung that is filled with aluminum oxide grout.
7. Provide galvanized ladder, including fasteners and brackets at exterior locations and as indicated. At interior locations, provide shop and finish paint.

F. Steel Pipe Railings and Handrails

1. General: Fabricate pipe railings, including guardrail systems and handrail systems, to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacings, and anchorage, but not less than that required to support structural loads. Conform to requirements of Article herein titled "System Performance Requirements". For pipe handrails for steel stairs refer to Section 05710.
2. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - a. At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
3. Form changes in direction of railing members as follows:
 - a. By radius bends of radius indicated.
4. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
5. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
6. Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or by use of prefabricated fittings.
7. Toe Boards: Where indicated, provide toe boards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use 4 inches high x 1/8 inch steel plate welded to, and centered between, each railing post.
8. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges,

miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

9. Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.
10. For exterior steel railings and handrails, form from galvanized steel pipe. Galvanize fittings, brackets, fasteners, sleeves and other ferrous components. If indicated on Drawings to be painted, form from plain steel, galvanize, and provide finish paint as specified herein with powder coating or epoxy coating system.
11. For interior steel railings form from steel pipe. Provide non-galvanized ferrous metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction. Provide shop and finish paint.
12. Furnish sleeve/base plate to mason for setting in concrete work.
13. Provide pipe railings of the following configurations unless indicated otherwise on the Drawings or required for structural design:

Center rails and free standing end rails on exterior steps: 1½" nominal diameter. Uprights shall be anchored into pipe sleeves in the concrete or masonry. Upright at upper level of center rail: 2" nominal diameter.

Rails at side of exterior steps against walls: 1" nominal diameter, with returns against wall at ends, and supported on brackets and wall plates.

Rails at side of exterior steps against iron fences: 1" nominal diameter, with returns at ends and supported on brackets and plates.

Handrails at area wall: 1¼" nominal diameter.

Exterior barrier guardrails (at areaways and other locations as indicated on the Drawings): 1½" nominal diameter pipe.

Interior barrier guardrails (at pits, changes in floor levels, and other locations as indicated on the Drawings): 1¼" nominal diameter pipe.

G. Miscellaneous

1. Provide all other miscellaneous metal work. All Work to be embedded in concrete or masonry work or in connection with bolts, anchors, and inserts shall be furnished at the proper time for setting. Those items exposed to the elements or located in exterior walls or roof shall be galvanized. Where exposed to view, also provide finish paint as specified herein with powder coating or epoxy coating system. Interior items shall be shop and finish painted.

2.04 PAINING

- A. All miscellaneous ferrous metal work, except those members to be galvanized, shall be given one shop coat of paint before leaving the shop. For those items to be zinc metallized or hot dip galvanized and finish painted, apply coatings in the shop as specified herein.
- B. Cleaning and Surface Preparation
 1. Clean all steel first in accordance with SSPC-SP1.
 2. Clean steelwork not to be painted (except steel work to be galvanized) in accordance with SSPC-SP2.
 3. Clean steelwork to be painted within the same day as it will be applied and in accordance with the following methods, determined by location and exposure:
 - a. Interior steel not exposed to view: SSPC-SP2.
 - b. Interior steel exposed to view: SSPC-SP3.
 - c. Cavity wall and exterior steel exposed to weather: SSPC-SP6.

C. Shop Coat

1. Apply steel primer paint (general application) at a rate to provide dry film thickness of 2.0 to 3.5 mils. Apply primer paint (cavity wall and exterior application) at a rate to provide dry film thickness of 4.0 to 6.0 mils. Provide full coverage of joints, corners, edges, and exposed surfaces.
2. Apply to dry surfaces only, when surface temperatures are above dew-point, by brush, spray, or roller, thoroughly and evenly, in strict accord with manufacturer's instructions for every detail of handling.
3. Apply second coat of the approved primer, in a darker shade, to surfaces inaccessible to painting after assembly or erection.
4. Protect machined surfaces with an approved rust-inhibiting coating that is readily removable prior to erection.

2.05 GALVANIZING AND FINISH COATING

A. General

Galvanize the following Work (items that are to be finish painted shall be galvanized by the zinc metallizing process or hot dip galvanized, and finish coated as specified herein):

1. All angles and other steel items located in exterior wall or roof construction
2. All angles supporting exterior masonry or exposed to the weather.
3. All steel members and fabrications exposed to the exterior.
4. All other steel members and fabrications indicated as galvanized on the Drawings and Specifications.

B. Zinc Metallizing-Finish Coating Applicators:

1. Atlantic Coast Metallizing & Coatings Corp., Melville, NY
2. Avant Guards Manufacturing, Brooklyn, NY

3. East Coast Metallizing & Coating Systems Inc., Westbury, NY
 4. Island Wide Sandblasting Inc., Wyandanch, NY
 5. Reneuxit LLC, West Chester, PA
- C. Hot Dip Galvanizing with Powder Coating Finish
1. Duncan Galvanizing Corp, Everett, MA
- D. Powder Coating Materials
1. Tiger Drylac, Ontario, California; Series 38 Super Durable Powder Coating.
 2. PPG Industries, Pittsburgh, PA; Coraflon Ultradurable Powder Coating.
 3. The Sherwin-Williams Co., Cleveland, OH; Powdura Super Durable Powder Coatings Series.
- E. Cleaning and Surface Preparation
1. Hardware (bolts, nuts, etc.): Clean and leave free of mill scale before galvanizing.
 2. Clean all steel first in accordance with SSPC-SP1 if needed.
 3. Steel members: Clean in accordance with SSPC-SP8 before hot-dip galvanizing.
 4. Steel members: Clean in accordance with SSPC-SP10 before zinc metallizing. Surface shall have a 3-4 mil anchor pattern. Moisture cannot be present on steel and temperature cannot be less than 5°F above the dew point. Thermal spray must be applied within 4 hours of blasting.
- F. Shop Coat - Hot-dip Galvanizing -as required for galvanized items not indicated to receive finish paint coat.
1. Galvanize hardware in accordance with ASTM A153.
 2. Galvanize steel shapes in accordance with ASTM A123. Apply zinc coating as per Thickness Grade specified in ASTM A123.
- G. Shop Coat - Galvanizing by the Zinc Metallizing Process - Provide for all galvanized items indicated

to receive finish paint, which includes all galvanized items exposed to public view, including lintels, and other items shown on Drawings or specified herein. Finish paint shall be the epoxy coat system or the powder coat system; producing a smooth, uniform surface, free of bubbles, runs, or sags. Hot Dip Galvanizing with powder coat finish is also permitted as specified in Paragraph H below.

1. Thermally spray metallizing material at a rate of 4.0 to 6.0 mils DFT. Sprayed coating shall be free of lumps, blisters, and loosely adhering particles. Coating shall be capable of passing the inspection requirements of Mil Std 2138A(SH) of 5/13/92, but with adhesion 750 psi minimum per ASTM D4541, Test Method E.
2. Epoxy Coating System: After the metallizing material has cured, apply a first coat of paint at a rate of 4.0 to 6.0 mils DFT, Polyamide Epoxy Paint such as Tnemec Series 27 FC Typoxy. Top coat shall be Acrylic Aliphatic Polyurethane such as Tnemec Series 73 Endura-Shield, applied at a rate of 2.0 to 3.0 Mils DFT.
3. Powder Coating System: After the metallizing material has cured, properly prepare the item and apply Tiger Drylac Series 38 Super Durable Powder Coating; or PPG Industries Coraflon Ultradurable Powder Coating; or Sherwin-Williams Powdura Super Durable Powder Coatings Series system.
 - a. Oven bake item for 20 minutes at 450°F, and remove all oil and grease. Cool surface to 72°F, clean with an organic solvent. Apply paint within 3 hours of final cleaning.
 - b. Apply an out-gas-forgiving primer at the rate of 2-3 mils DFT. Oven cure material at 400°F for 10 minutes.
 - c. In order to avoid oxidation, final topcoat must be applied within 12 hours.
 - d. Apply a lead-free TGIC polyester powder topcoat finish at a rate of 4.0 to 5.0 mils DFT.
 - e. Oven cure at 400°F to 450°F, for 30 minutes, or as recommended by coating manufacturer.

H. Hot Dip Galvanizing with Powder Coating Finish

As a system equivalent to zinc metallizing, it is permitted to use the Duncan Colorgalv Thermoset process of hot dip galvanizing with powder coat finish. Galvanizing coating thickness grade per ASTM A123 shall be 100, with DFT mil thickness coating not less than 3.6 to 3.9 mils.

1. Comply with ASTM A123 for fabricated products and ASTM A153 for hardware, with zinc coating thicknesses not less than those specified in this specification Section 05500, 3.6 to 3.9 mils DFT.
2. Fill vent holes after galvanizing, if applicable, and grind smooth.
3. Galvanizing shall exhibit a rugosity (smoothness) 4 rug or less (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments.
3. The incoming material shall be inspected, material hung on a rack or chain to be galvanized.
4. Material submerged into caustic cleaner removing the organics from the surface and rinsed with water.
5. Material pickled with hydraulic acid removing iron oxides from the surface and rinsed with water.
6. Material submerged into a flux removing any oxides that have formed after pickling and protecting the material from further formation of additional oxides before being galvanized.
7. The material submerged into Zinc bath at 850° F.
8. The material shall be allowed to naturally cool and not quenched with water or chemicals.
9. The galvanizing shall be inspected and pre-finished, removing edge tears, spikes, drips, or sharp protrusions which could cause potential harm to someone handling or using the material.

10. The Galvanized material shall be abraded to create a 1-1.5 mil profile for surface preparation. The profile shall be produced by abrasive blasting and or hand abrading.
11. The galvanized material shall be inspected prior to powder coating to determine conformance of the material to ASTM A123 and this specification Section 05500 for quality and thickness of zinc coating, not less than 3.6 to 3.9 mils DFT.
12. The galvanized surface profile shall be measured at 1-1.5 mils and recorded utilizing Press-O-Film tape.
13. All galvanized material shall be outgassed after profiling and before powder coat application.
14. A coating inspection form shall be filled out completely with material information, application conditions, and quality standards.
15. All powder coating products shall be electrostatically applied following the recommendations of the powder supplier and the requirements of the powder coating Manufacturers Technical Data Sheet, and with Dry Film Thickness not less than is specified in this specification Section 05500.
16. The first coat shall consist of an Epoxy Primer powder applied at not less than 2.0 - 3.0 mils Dry Film Thickness. The powder shall be heated to 400° F to provide adhesion with the next coat of powder, and in accordance with the manufacturer's recommendations.
17. The next coat of powder to be applied shall be Sherwin Williams Powdura Super Durable or approved equal applied at a dry film thickness of not less than 4.0-5.0 mils. The surface of the fabrications after applying the powder shall be heated to 400°F for at least 10 minutes to cure the powder and in accordance with the manufacturer's recommendations. The color of the powder shall match the approved color sample that will be approved by the Project Architect.
18. All repairs of galvanizing shall follow ASTM A780.

19. All repairs to powder coating shall be sanded and feathered with the surrounding area. The damaged area shall be cleaned and abraded to receive a powder or liquid coating. The liquid coating can be applied using either a spray or brush method.
20. Apply powder coating system within time frame after galvanizing as part of the Duncan Colorgalv process to ensure oxides will not form and GoldGalvthermoset process will be complete.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Make all required measurements in the field to ensure proper and adequate fit.

3.02 DISCREPANCIES

- A. Immediately notify the Authority's Representative.
- B. Do not proceed until fully corrected.

3.03 ERECTION/INSTALLATION

- A. Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
 1. Provide inserts, setting plates, and other items of concealed work required for attachment of metal fabrications in a timely manner to facilitate on-going construction.
- B. Perform cutting, drilling, and fitting required for installation of metal fabrications. Set work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels. Do not weld, cut, or abrade surfaces of metal fabrications that have been coated or finished after fabrication and are intended for field connection by mechanical means without further cutting or fitting.
- C. Fit exposed connections accurately together to form tight, hairline or, where indicated, with uniform reveals and spaces for sealants and joint fillers.

- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- E. Install concealed gaskets, joint fillers, insulation and flashings as the work progresses, so as to make work weathertight, sound proof or lightproof as required.
- F. Restore protective coverings that have been damaged during shipment or installation of the work. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at the same location.
- G. Field Welding: Comply with applicable AWS specification for procedures of manual shielded metal-arc welding, for appearance and quality of welds made, and for methods used in correcting welding work. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed welded joints smooth and restore finish to match finish of adjacent surfaces.
- H. Corrosion Protection: Coat concealed surfaces of aluminum and steel which will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- I. Adjust metal fabrications prior to anchoring to ensure matching alignment at abutting joints.
- J. Install items as detailed in the drawings; for manufactured items, install as recommended by the Manufacturer, unless indicated otherwise.
- K. Coordinate with other trades involved.
- L. Install detectable warning surfacing in manner for top surface to align with adjacent finish flooring surface (or slab surface for finished exposed concrete).
- M. Field Touch-Up
 - 1. Painted Members: After erection, clean all damaged areas in shop coat, exposed surfaces of bolts, bolt heads, nuts and washers, abrasions, and all field welds and unpainted areas adjacent to field welds to the same standards as the shop coat and paint with primer paint to same thickness as the shop coat. Finish painting is specified in Section 09900.

2. Galvanized Members: After erection, clean and paint all damaged areas to the galvanizing, welds, and areas adjacent to welds with the galvanizing repair paint complying to ASTM A780. For galvanized members to be painted, finish painting shall be the final two coats of the epoxy coating system. For powder coating system follow instructions of the powder coat manufacturer, to match surrounding undamaged areas.

3.04 PROTECTION

- A. Protect finishes of metal work from damage during construction period by use of temporary protective coverings approved by ornamental metal manufacturer. Remove protective covering at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data: (for each item)	_____	_____
Shop Drawings: (for each Item)	_____	_____
1. Materials, Locations, sizes, shapes		
2. Fastening, anchorage, connections, bracing		
Structural Design & Calculations:	_____	_____
Samples:	_____	_____
Welder Certificates:		
Qualification:	_____	_____
1. Fabricator		
2. Installer		
3. Professional Engineer		
4. Zinc Metallizer or Hot Dip Galvanizer		
Test Reports:		
Zinc metallizing or	_____	_____
Hot dip galvanizing and		
Finish coatings		
Warranty:	_____	_____

* * *

SECTION 06 10 00
ROUGH CARPENTRY**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

- A. Provide rough carpentry Work as indicated on the Drawings, as required for the completed Work of this Contract, and as specified herein, including, but not limited to, the following:
1. Wood Grounds, nailing strips, blocking, furring, nailers, and framing.
 2. Curbs.
 3. Rough hardware, including nails, screws, anchors, brackets, braces, bolts, nuts, fittings, and other devices required for the proper fitting, connecting, and erecting of the Work.
 4. Preservative treatment for wood.
 5. Fire-retardant treatment for wood.
 6. Plywood decking, subflooring, and underlayment.
 7. Miscellaneous Lumber.

1.02 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
1. U.S. Department of Commerce.
American Softwood Lumber Standard PS 20
Product Standard PS 1 for Softwood Plywood
 2. APA Engineered Wood Association. APA
Design/Construction Guide
 3. Western Wood Product Association (WWPA).
Grading Rules
 4. Southern Pine Inspection Bureau (SPIB).

Grading Rules

5. Redwood Inspection Service (RIS).
Grading Rules
6. American Wood Preservers' Association (AWPA).
Standard UC1
7. American Society for Testing and Materials (ASTM).
A575 Standard Specification for Steel Bars,
Carbon, Merchant Quality, M-Grades

E84 Standard Test Method for Surface Burning
Characteristics of Building Materials

D226 Standard Specification for Asphalt-Saturated
Organic Felt Used in Roofing and Waterproofing
8. Underwriters Laboratories, Inc. (UL).
UL Test 723
9. Federal Specifications (FS).
10. American Lumber Standards Committee (ALSC).
11. West Coast Lumber Inspection Bureau (WCLIB).
Grading Rules
12. National Fire Protection Association (NFPA).
Test 255 Method of Test of Surface Burning
Characteristics of Building Materials
13. Commercial item Descriptions (CIDS)

1.03 SUBMITTALS

A. Quality Control Submittals

1. Certificates: Certification for the following
wood treatments:
 - a. Dip Treatment: Certification by treating
plant stating chemical solutions used,
submersion period, and conformance with
applicable standards.
 - b. Pressure Treatment: Certification by
treating plant stating chemicals and process
used, net amount of chemical preservative
retained, and conformance with specified
standards.

- c. Waterborne Preservatives: Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
- d. Fire-Retardant Treatment: Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes. Submit BSA or MEA approval certification.

1.04 QUALITY ASSURANCE

A. Mill and Producers Mark

Each piece of lumber and plywood shall be grade stamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.

- 1. Pressure Preservative Treated Material: Accredited agency quality mark on each piece of wood including treatment.
- 2. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.

B. Standards

Comply with the following unless otherwise specified or indicated on the Drawings:

- 1. Lumber: American Softwood Lumber Standard PS 20 by the U.S. Department of Commerce. Comply with applicable provisions by each indicated use.
- 2. Plywood: Product Standard PS 1 for Softwood Plywood, Construction and Industrial by the U.S. Department of Commerce.
- 3. Plywood Installation: APA Design/Construction Guide, by the American Plywood Association (APA), except as indicated otherwise.
- 4. Grading Rules:

- a. Douglas Fir, Hem-Fir, Idaho White Pine, and other Western Woods: Western Wood Products Association (WWPA) or West Coast Lumber Inspection Bureau (WCLIB).
 - b. Southern Pine: Southern Pine Inspection Bureau (SPIB).
 - c. Redwood: Redwood Inspection Service (RIS).
- 5. Preservative Treatment: American Wood Preservers' Association (AWPA) Standards, quality control methods, and inspection requirements
 - 6. Fire-Retardant Treatment: American Wood Preservers' Association (AWPA) Standards.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials dry during delivery. Store materials 6" minimum above ground surface. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation between stacks.
- B. Cover stored materials until ready for use for protection from moisture. Place and anchor covering in a manner which will assure good ventilation under the covering.

1.06 PROJECT CONDITIONS

- A. Correlate location of supporting members to allow proper attachment of other Work as specified in this Section.

PART 2 - PRODUCT

2.01 LUMBER

- A. General

Furnish seasoned dimensional lumber dressed to nominal sizes indicated with 19 percent maximum moisture content at time of dressing, marked "S-DRY". Comply with dry size requirements of PS 20.

- 1. Dress: Surfaced 4 sides (S4S) unless otherwise indicated.

B. Framing Lumber

Species: Douglas Fir (WWPA or WCLIB), or Southern Pine (SPIB), unless otherwise indicated.

Refer to Drawings

1. Light Framing; 2" through 4" thick, less than 6" wide:
 - a. Stud Framing Grade: Construction Grade.
 - b. Other Light Framing Grade: No. 2.
2. Structural Framing; 2" through 4" thick, 6" and wider:
 - a. Grade: No. 1.

C. Board Lumber; less than 2" thick:

1. Exposed Board Lumber, for Paint Finish: Southern Pine No. 1 (SPIB), Douglas Fir 2 Common (WWPA) or Select Merchantable (WCLIB), or Redwood Construction Common (RIS).
2. Exposed Board Lumber, for Transparent Finish: Redwood Clear (RIS).
3. Concealed Board Lumber: Southern Pine No. 3 (SPIB), any species No. 4 (WWPA) or any species Standard (WCLIB), or Redwood Merchantable (RIS).

D. Miscellaneous Lumber

Standard grade, No. 3 grade, or better grade of the following species unless otherwise indicated:

1. Nailers and Blocking: Douglas Fir, Hem-Fir, Idaho White Pine or Southern Pine.
2. Furring: Douglas Fir or Southern Pine.
3. Plaster Grounds:
 - a. Interior Use: Douglas Fir or Southern Pine.
 - b. Exterior Use: Western Red Cedar or Redwood.
4. Floor Sleepers: Western Red Cedar or Redwood Construction Heart.

5. Door and window Bucks: Western Red Cedar or Redwood.

2.02 PLYWOOD

- A. Roof and Wall Sheathing and Subflooring: APA RATED SHEATHING, EXPOSURE 1. Furnish APA PS 1 veneered panels, with span ratings for the required thicknesses as listed below unless otherwise indicated.

<u>Thickness</u>	<u>Span Rating</u>
3/8"	24/0
1/2"	32/16
5/8"	40/20
3/4"	48/24

- B. Underlayment

APA UNDERLAYMENT, EXPOSURE 1.

1. For use under resilient tile flooring and resilient sheet flooring: Sanded face.
2. For use under carpet and "liquid" flooring: Touch-sanded.

- C. All plywood used within the weatherproofing/waterproof membrane (interior) of the building shall contain no added urea- formaldehyde. This requirement applies to plywood roof and wall sheathing.

2.03 MISCELLANEOUS MATERIALS

- A. Underlayment Patching Compound

Hardsetting, quicksetting type with latex or polyvinyl acetate binder.

- B. Asphalt Felt

Asphalt-saturated felt, No. 15, without perforations, complying with ASTM D226.

- C. Rosin Paper

Commercial, rosin-sized building paper, 0.010" thick.

- D. Hardboard

PS 58, Class "Tempered, S1S, plainboard.

E. Adhesive

APA Specification AFG-01. For adhesive used on site and within the weatherproofing/waterproof membrane (interior) of the building, comply with V.O.C. requirements specified in Section G01600.

2.04 PRESERVATIVE TREATMENT

A. Treat lumber and plywood where indicated and as specified. Comply with applicable AWP Standards and quality control and inspection requirements.

1. Fasteners and anchoring devices to be used with wood treated with waterborne preservatives shall be hot-dip galvanized or stainless steel if the wood will be exposed to moisture.

B. Complete fabrication of items to be treated to the greatest extent possible, prior to treatment. Where items must be cut after treatment, coat cut surfaces with heavy brush coat of the same chemical used for treatment or other solution recommended by AWP Standards for the treatment.

C. Inspect wood after treating and drying. Discard warped or twisted items.

D. Pressure Treatment (Above Ground Use)

Treat the following wood items with waterborne preservatives for above ground use, complying with . AWP Standards **T1-T10**. Redry wood to a maximum moisture content of 19 percent after treatment.

1. Nailers, blocking, cants, shim stock, and similar members used in conjunction with roofing (including related flashings, trim and vapor barrier), coping, and waterproofing.

2. Nailers, blocking, furring, stripping, and similar concealed members in contact with exterior masonry and concrete (including interior wythe of exterior walls), and all sills for framing.

3. Wood items indicated or scheduled on the Drawings to be preservative treated.

E. Pressure Treatment (Ground Contact Use)

Treat the following wood items with waterborne preservatives for below ground use, complying with AWPA Standards **T1-T10**.

1. Wood members placed in the ground.
2. Wood members immersed in fresh water.

2.05 FIRE-RETARDANT TREATMENT

A. Where lumber is indicated or required to be fire-retardant treated, provide "**UCFA**" lumber, complying with AWPA Standards for pressure impregnation with fire-retardant chemicals to achieve a flamespread rating of 25 or less, when tested in accordance with UL Test 723, ASTM E84 or NFPA Test 255.

1. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment which will not bleed through or adversely affect bond of finish.
2. Provide UL label or identifying mark on each piece of fire-retardant lumber.
3. Redry treated items to a maximum moisture content of 19 percent after treatment.

B. Fire-retardant Treated Plywood

Comply with APA requirements.

2.06 FRAMING HARDWARE

A. Fasteners and Anchoring Devices

Provide items of type, size, style, grade, and class as required for secure installation of the Work. Items shall be galvanized for exterior use. Unless shown or specified otherwise, comply with the following:

1. Nails and Staples: ASTM F1667
2. Wood Screws: FS FF-S-111D.
3. Bolts and Studs: FS FF-B-575C.
4. Nuts: FS FF-N-836E.
5. Washers: FS FF-W-92B.

6. Lag Bolts or Lag Screws: ASME/ANSI B18.2.1
7. Masonry Anchoring Devices: Expansion shields, masonry nails and drive screws: CIDS A-A-1925A, A-A-55614, A-A-55615
8. Bar or Strap Anchors: ASTM A575 carbon steel bars.
9. Wall Plugs: Corrugated type, galvanized steel, 24 USS gauge min, not less than 2" wide x 2½" deep.
10. Cross Bridging: Nailable type, galvanized steel, 16 USS gauge min, by ¾" wide.
11. Metal Hangers and Framing Anchors: Size and type for intended use, galvanized finish, manufacturer's recommended fasteners.
12. Buck Anchors: Corrugated type, galvanized steel not lighter than 12 USS gauge min, 4" wide (except where partitions are less than 4" thick) by 8" long, punched for two 5/16" carriage bolts at buck end.
13. Sleeper Anchors: Approved type, galvanized steel not lighter than 20 USS gauge min, not less than 1¼" wide, designed to anchor into concrete not less than 1½" and permit height adjustment of sleeper.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions

Examine substrate and supporting structure on which rough carpentry is to be installed for defects that will adversely affect the execution and quality of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION - GENERAL

- A. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or with optimum joint arrangement.
- B. Install Work accurately to required lines and levels with members plumb and true, accurately cut and fitted

and securely fastened. Closely fit rough carpentry to other associated construction.

- C. Securely attach carpentry Work to substrates by anchoring and fastening as indicated, or, if not indicated, as required by the referenced standards. Select fasteners of size that will not penetrate through members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required. Set nail heads in exposed Work which is to be painted or stained and fill resulting holes.
- D. Fire-retardant Treated Wood
 - 1. Do not rip or mill; only end cuts, drilling holes and joining cuts shall be permitted.
 - 2. Where material is cut to length, shaped or grooved after treatment, surfaces thereby exposed shall be protected by tightly butting them against noncombustible or fire-retardant treated material, in accordance with the NYC Building Code. Drilled holes shall be covered with tightly fitting noncombustible cover plates.

3.03 WOOD FRAMING

- A. Install framing members of nominal sizes indicated or of units built-up to dimensions indicated, on spacings shown. Construct required openings for installation of related work. Do not splice structural members between supports.
- B. Anchor and nail members as indicated. If not included, comply with recommendations of the NFPA.
- C. Install miscellaneous blocking and framing indicated and as required for attachment and support of facing materials, fixtures, specialty items, and trim.
- D. Stud Framing

Install stud framing indicated. Unless otherwise shown, use 2" x 4" wood studs spaced 16" o.c with 4" face perpendicular to direction of wall or partition. Install single bottom plate and double top plates 2" thick by width of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction.

1. Construct corners and intersections with not less than 3 studs. Frame openings with multiple studs and headers. Install nailed header members of thickness equal to width of studs.
2. Install diagonal bracing in exterior wall stud framing unless otherwise indicated. Brace both walls at each external corner, full story height, at 45 degree angle. Use either a let-in 1" x 4" board or 2" x 4" blocking.

3.04 WOOD NAILERS, BLOCKING, AND GROUNDS

A. Install required items where indicated and where required for support, attachment or screeding of other Work. Form to shapes indicated or required. Coordinate locations and cut and shim as required to provide items at true and level planes to receive Work to be attached. Install closure strips to nailers at all edges.

1. Attach to substrates as indicated; if not indicated, size and space fasteners as required to support applied loading. Maximum spacing of fasteners shall not exceed 16". Unless otherwise shown on the Drawings, install and secure material to non-wood construction as follows:
 - a. To Concrete: Attach material less than 1½" thick with screws and non-ferrous metal expansion shields. Attach materials 1½" and thicker with machine bolts and non-ferrous metal compound type anchors.
 - b. To Concrete Unit Masonry: Attach material to new masonry with annular ring nails driven into wall plugs where fastening occurs at joints of masonry or with special hardened steel masonry nails where fastening occurs in the masonry units. Attach material to existing masonry with machine screws and non-ferrous metal expansion shields where fastening occurs in solid portions of masonry. If fastening occurs at cells of masonry, secure material in place with toggle bolts.
 - c. To Brick Masonry: Attach material to new masonry with annular ring nails driven into wall plugs. Attach material to existing masonry with machine screws and non-ferrous metal expansion shields.

- d. To Steel: Attach material with galvanized bolts and nuts or stainless steel machine screws tapped into the metal, as required by conditions.
 - e. To Non-Ferrous Metal: Attach material with stainless steel or other approved non-ferrous metal bolts and nuts or self-tapping screws, as required by conditions.
- 2. Counter-sink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry Work. Where possible, anchor to formwork before concrete placement. Bevel both edges of members to be anchored in concrete. Shims shall be cedar shingles or redwood wedges.
 - 3. Install permanent grounds of dressed, preservative treated, key beveled lumber not less than 1½" wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.
 - 4. The grounds for coat hook and bracket strips in wardrobe cabinets shall be attached to partitions with toggle bolts and to brick walls with expansion bolts before any plastering is done.

3.05 PLYWOOD SHEATHING, SUBFLOORING, AND UNDERLAYMENT

- A. Comply with printed installation requirements of the APA Design/Construction Guide, for plywood application required, unless otherwise indicated.

- B. Plywood Underlayment

Install underlayment just prior to installation of finish flooring. Stagger end joints between panels in relation to each other and stagger all joints in relation to substrate jointing. Allow 1/32" space between panel ends and edges for expansion. Fasten in accordance with APA recommendations. Prior to installation of finish flooring, patch damaged areas wider than 1/16". Set nails 1/16", but do not fill. Sand rough areas smooth, and uneven joints flush. Fasteners must be flush with the surface of the subfloor.

- C. Roof Sheathing

Install panels with face grain across supports. Provide supports at edges by use of clips, wood blocking, or T. & G. panels. Allow 1/16" spacing at panel ends; 1/8" spacing at edges.

Nail 6" o.c along edges and 12" o.c at intermediate supports.

D. Wall Sheathing

Allow 1/16" spacing at panel ends and 1/8" spacing at edges.

Nail 6" o.c along panel edges and 12" o.c at intermediate supports.

E. Subfloor

Install panels continuous over two or more spans, with face grain across supports. End joints shall occur over supports. Allow 1/16" spacing at panel ends and 1/8" at edges.

Before placing panels, apply continuous line of adhesive on joists.

F. Nails

Common.

For plywood thickness to 1/2": 6d.

For plywood thickness greater than 1/2": 8d.

3.06 WOOD FURRING

A. Install members plumb and level with closure strips at all edges. Shim with wood as required to achieve tolerance specified.

1. Fastening: Attach to substrates as indicated; if not indicated, attach material as specified for nailers and blocking.
2. Tolerance: Shim and level wood furring to a tolerance of 1/8" in 10'.
3. Furring to Receive Plywood Paneling: Unless otherwise indicated, 1" x 3" furring at 2' o.c, horizontally and vertically.

4. Furring to Receive Gypsum Drywall: Unless otherwise indicated, 1" x 2" furring at 16" oc, vertically.
5. Option: In lieu of the grounds for hook and bracket strips, fasten the strips directly to the finished plastered walls provided toggle bolts are used, spaced not over 2' o.c. This option is given on condition that a power drill is used for drilling holes for toggle bolts through the plaster and terra cotta partitions.
6. Where walls are furred out to receive wardrobes, lockers, and other casework, provide and set all required dressed studs, blockings, nailing pieces, and grounds. The studs shall be bolted to the iron frames with 3/8" diameter bolts, spaced as indicated on Drawings.

3.07 METAL WALL PLUGS

- A. Furnish to mason all necessary information to enable him to lay out correctly the location for metal wall plugs. All grounds, furring and standing finish on plastered walls and partitions, except where otherwise specified, shall be secured to metal wall plugs.

3.08 BOARDS, STRIP

- A. Furnish and set all wood blocking and nailing strips at coping coverings, canopy fascias, slag stops, fascia boards, base flashing pitch pockets, railing sleeves and similar locations, of No. 1 common southern pine, of sizes indicated on Details. All blocking and nailing strips shall be preservative treated by pressure method as specified in Art. 2.04.
- B. Furnish and set all blockings required at skylight and ventilator curbs, and at all other places where indicated or required.
- C. Provide wood curbs of sound, seasoned, dressed material of size indicated on Drawings, with corners mitered and securely nailed, and with top outer edges splayed off. Anchor Wood curbs in place at top of concrete curbs with 3/8" anchor bolts, 3 feet on centers and at brick curbs with 1/2" bolts extending through curb angles. Top nuts of all bolts shall be countersunk into curbs.
- D. Where copper gutters, or other such copper covered Work is indicated on the Drawings, furnish and set all wood nailing strips, blocking, sheathing, rough

framing and other members required for the securing and backing of the copper covered Work. For shapes, spacing and locations of the rough carpentry Work, see Detail Drawings.

- E. Where batten seam copper roofing is indicated on Drawings, furnish and install all required wood battens and nailing sleepers together with all other required wood blocking, nailing strips, ridge strips, and other members, as indicated on the Details. The wood nailing sleepers, to receive the wood battens shall be nailed to sleeper clips which shall be embedded in the sloping concrete roof slab as shown on Detail, spaced as indicated.

The sleeper clips shall be 9 gage galvanized wire floor sleeper clips and shall be spaced 16" o.c. The top surface of nailing sleepers shall be set level and true by using wood or metal leveling strips. Wood batten shall be secured to the nailing sleepers with proper size nails by toe nailing at each bearing or as will be directed.

- F. Furnish and install all required wood nailing sleepers of the required size under all standing and transverse seams of copper roofing together with all wood blocking, nailing strips, ridge strips, and other to properly install and receive the copper roofs, gutters, eaves, and other items as indicated on the Drawings. Verify locations of nailing strips.

3.09 ROUGH HARDWARE

- A. Furnish and install all rough hardware, such as nails, bolts, buck anchors, clips, (including expansion and carriage bolts for wall seats, wardrobe brackets, etc.), and all other rough hardware required to secure the carpentry work in place, unless otherwise specified.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
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Quality Control Certificates:

1. Dip Treatment- Certification by treating plant stating chemical solutions used, submersion period, and conformance with applicable standards.
2. Pressure Treatment- Certification by treating plant stating chemicals and process used, net amount of chemical preservative retained, and conformance with specified standards.
3. Waterborne Preservatives- Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
4. Fire-Retardant Treatment- Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes. Submit BSA and MEA approval certification.

* * *

SECTION 07 46 40
VINYL SIDING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Solid vinyl siding.
- B. Vinyl trim.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Framing and Sheathing.
- B. Section 07 90 00 - Joint Sealers.

1.03 REFERENCES

- A. ASTM D 256 - Standard Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- B. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- C. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
- D. ASTM D 648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load.
- E. ASTM D 696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 Degrees C. and 30 Degrees C.
- F. ASTM D 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- G. ASTM D 2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
- H. ASTM D 3679 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding.
- I. ASTM D 4477 - Standard Specification for Rigid Unplasticized Poly(Vinyl Chloride)(PVC) Soffit.

- J. ASTM D 6864 - Standard Specification for Color and Appearance Retention of Solid Colored Plastic Siding Products.
- K. ASTM D7251 - Standard Specification for Color and Appearance Retention of Variegated Color Plastic Siding Products.
- L. ASTM D 7856 - Standard Specification for Color and Appearance Retention of Solid and Variegated Color Plastic Siding Products using CIELab Color Space.
- M. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- N. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2000.
- O. UBC STD 26-9 - Method of Test for the Evaluation of Flammability Characteristics of Exterior, Nonload-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus; 1997.

1.04 DESIGN / PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Code compliance in accordance with the following:
 - 1. 2020 Building Code of New York State
 - 2. 2020 Energy Conservation Code of New York State

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 23.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance and care requirements.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Provide installer with not less than three years of experience with products specified.
- B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Accepted mock-ups shall be comparison standard for remaining work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store on a flat surface under cover, stacked no more than 12 boxes high. Do not store in location where temperatures may exceed 130 degrees F.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

- A. Provide manufacturer's standard limited lifetime warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Ply Gem Industries, Inc., 2600 Grand Blvd., Suite 900, Kansas City, MO 64108. ASD. Telephone Toll Free: (800) 962-6973 or (800) 788-1964. Fax: (866) 656-1900, Website: www.gpvinylsiding.com. Email support@mastichomesinfo.com.

- B. Owens Corning <https://www.owenscorning.com/en-us>
- C. CertainTeed <https://www.certainteed.com/siding/>
- D. Substitutions: Not permitted.

2.02 MATERIALS

- A. Siding - General Requirements: Polyvinyl chloride products with the following characteristics:
 - 1. Siding: Comply with ASTM D 3679, Class 2.
 - 2. PVC cell classification in accordance with ASTM D 1784: 13334.
 - 3. Coefficient of linear expansion in accordance with ASTM D 696: 0.000029 inch per inch per degree F.
 - 4. Tensile strength when tested in accordance with ASTM D 638: Minimum 6,326 pounds per square inch.
 - 5. Modulus of elasticity when tested in accordance with ASTM D 638: Minimum 360,000 pounds per square inch, average.
 - 6. Izod impact, standard 1/8 inch bar when tested in accordance with ASTM D 256: 3.30 foot-pounds per inch, average.
 - 7. Shore D Hardness: Minimum 82.
 - 8. Specific Gravity: Minimum 1.39.
 - 9. Deflection temperature when tested in accordance with ASTM D 648: 170 degrees F, 264 pounds per square inch.
 - 10. Smoke density rating when tested in accordance with ASTM D 2843: 48 percent, average.
 - 11. Horizontal flammability, when tested in accordance with ASTM D 635:
 - a. Burn distance: 20 mm.
 - b. Burn time: Less than 5 seconds.
 - 12. Surface burning characteristics when tested in accordance with ASTM E 84: Flame spread less than 20, fuel contribution 0, smoke density 275.
 - 13. Fire Resistance - Siding: 1 hour, when tested in accordance with ASTM E 119, with siding applied over gypsum sheathing.
 - 14. Flammability - Siding: Comply with requirements of UBC Std 26-9.
- B. Fasteners: Aluminum nails, alloy 5056 or 6110, having minimum tensile strength 63,000 pounds per square inch.
- C. Vapor Retarder: Specified on drawings.
- D. Joint Sealers: Specified in Section 07900.

2.03 VINYL SIDING AND TRIM

- A. Forest Ridge Vinyl Siding (Basis of Design)
1. Product Description: Double 4 inch Standard Lap, 8 inches exposure; nominal 0.044 inch material thickness (Vinyl); 12 foot 6 inch panel length.
 - a. Nailing Hem: Enhanced 1-3/8 inch wide nail hem with 1-1/4 inch elongated nail slots on 1-5/8 inch centers.
 - b. Finish: Wood Grain.
 - c. Color: As selected from manufacturer's full range of standard colors.
 - d. VSI Certified Vinyl siding with Color Retention: Meets or exceeds requirements of ASTM D 7856, ASTM D 6864, and ASTM D 7251.

2.04 VINYL TRIM

- A. Vinyl Trim:
1. Soffit J-Trim 3/8 inch: Channel, 1-1/2 inches nailing leg, 3/4 inch forward leg, 3/8 inch channel width; color. Length 12 foot 6 inches.
 2. Soffit J-Trim 1/2 inch: Channel, 1-1/2 inches nailing leg, 3/4 inch forward leg, 1/2 inch channel width; color. Length 12 foot 6 inches.
 3. Soffit F-Trim: Channel, 1-1/2 inches reveal, 1/2 inch forward leg, 3/4 inch depth; color. Length 12 foot 6 inches.
 4. H-Mold: 5/8 inch with pebble finish, 1-7/8 exposed face. Length 12 foot 6 inches.
 5. Fascia: 8 inch with wood grain finish. Length 12 foot 6 inches.
 6. J-Channel: Channel, 1-1/2 inch nailing leg, 3/4 inch forward leg, 1/2 inch channel width; color.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared. Verify dimensions and acceptability of substrate

- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Installation of vapor retarder as per manufacturer's instructions.
- C. Attach vinyl products to substrate for weathertight installation; ensure that horizontal components are installed true to level, that vertical components are installed true to plumb.
- D. Stagger lap joints in horizontal siding in uniform pattern as successive courses of siding are installed.
- E. Install joint sealers as specified in Section 07 90 00.

3.04 ADJUSTING AND CLEANING

- A. Clean dirt from surface of installed products, using mild soap and water.
- B. After completing installation, remove from project site excess materials and debris resulting from installation of vinyl products.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 54 23a
THERMOPLASTIC POLYOLEFIN (TPO) ROOFING - College Theatre

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system on concrete deck and cementitious wood fiber deck, including:
2. Substrate board.
3. Vapor retarder on concrete deck.
4. Roof insulation.
5. Roof insulation cover board.
6. Walkway material.
7. Roof edge warning strip.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative,, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review drawings and specifications.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel,

equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 1. Base flashings and membrane terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 2. Tapered insulation, including slopes and crickets.
 3. Roof plan showing types and orientation of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing if applicable.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
 2. Walkway pads or rolls.
 3. Metal termination bars.

- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer and Roofing Inspector.
 - 1. Include letter from Manufacturer written for this Project indicating approval of Installer.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
 - 2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing membrane, flashing sheets, adhesives, and sealants.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- E. Warranties: Unexecuted sample copies of special warranties.
- F. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
 - 1. Submit reports within 72 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

- A. Executed copies of warranties.
- B. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section, UL listed for roofing systems comparable to that specified for this Project, with minimum five years' experience in manufacture of thermoplastic roof membrane products in successful use in similar applications.
- C. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:
 - 1. Written explanation of why the substitute system should be considered.
 - 2. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.
 - 3. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
 - 4. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
 - 5. List minimum five (5) roofing projects, installed within 50 miles of New Paltz, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.

6. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.
 7. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
 8. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre- approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.
- D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.
 2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.
- E. Manufacturer's Installation Instructions: Obtain and maintain on-site access to manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT / FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3. Remove temporary plugs from roof drains at end of each day.
 - 4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
 - 1. Form of Warranty: Manufacturer's standard warranty form.
 - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 - 3. Warranty Period: 20 years from date of completion.

- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
 - 1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
 - 1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 - 2. Scope of Warranty: Work of this Section.
 - 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
 - 1. Johns Manville.
 - 2. Firestone Building Products.
- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 10,000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746/C 3746M, ASTM D 4272/D

4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

- B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and applicable code.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1.
 - 1. Design Pressure: As indicated on Drawings.
- D. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 - 1. FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.
 - 2. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 - 3. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- E. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 MATERIALS, GENERAL

- A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

2.4 THERMOPLASTIC MEMBRANE MATERIALS**A. TPO Roof Membrane:**

1. Thermoplastic Polyolefin (TPO) Sheet: Internally fabric reinforced and fleece-backed, ASTM D6878.
 - a. Basis of design product: Tremco, TremPly Max TPO FB Single Ply Roof Membrane.
 - b. Breaking Strength, ASTM D751, for 50 mil sheet: 375 lbf (65 k/Nm) by 330 lbf (57 kN/m) .
 - c. Tear Strength, ASTM D751: 70 lbf (12 k/Nm) by 130 lbf (22 k/Nm).
 - d. Elongation at Break, ASTM D751: 30 percent.
 - e. Membrane Thickness, nominal: 60 mils (1.5 mm).
 - f. Exposed Face Color: Gray.
 - g. Solar Reflectance Index (SRI) ASTM E1980: 87 (gray, Initial).

- B. Sheet Flashing: Manufacturer's standard smooth-backed sheet flashing of same material, type, reinforcement, thickness, and color as TPO sheet membrane.

2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Single-Ply Roof Membrane Sealants: 450 g/L.
 - c. Nonmembrane Roof Sealants: 300 g/L.
 - d. Sealant Primers for Nonporous Substrates: 250 g/L.
 - e. Sealant Primers for Porous Substrates: 775 g/L.

B. Membrane Bonding Adhesive:

1. Bonding adhesive, water-based acrylic emulsion, low-VOC, for bonding TPO single ply smooth and fleece-backed membranes and flashings to substrates.
 - a. Basis of design product: Tremco, TremPly TPO WB Bonding Adhesive.
 - b. VOC, maximum, ASTM D3960: <10 g/L.

C. Flashing Membrane Adhesive: Same as membrane bonding adhesive.

D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.

E. Termination Joint Sealant: Silicone, S, NS, 25 or 50, NT: Single-component, nonsag, plus 25 to 50 percent and minus 25 to 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, and compatible with adjacent materials.

F. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.6 VAPOR RETARDER FOR CONCRETE DECKS

A. Vapor Retarder Membrane:

1. SBS/SEBS-modified asphalt-coated composite polyester and glass-fiber reinforced sheet, smooth surfaced, designed for heat-welded applications, ASTM D6162 Type III Grade S .
 - a. Basis of design product: Tremco, POWERply SBS Base HW (Heat Weld).
 - b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: 275 lbf/in (48 kN/m).
 - c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: 380 lbf (85 N).
 - d. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D5147: 3 percent.

- e. Low Temperature Flex, ASTM D5147: -20 deg. F (-28 deg. C).
 - f. Thickness, ASTM D5147: 0.090 inch (2.3 mm).
- B. Vapor Retarder Primer:
- 1. Asphalt primer, water-based, polymer modified.
 - a. Basis of design product: Tremco, TREMprime WB.
 - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 2 g/L.
 - c. Colour: Brown/black.

2.7 ROOF INSULATION MATERIALS

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from insulation manufacturer's standard sizes, suitable for application, and of thicknesses indicated.
- 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- B. Roof Insulation: Provide roof insulation product in thicknesses indicated in Part 3 as follows:
- 1. Polyisocyanurate board insulation, ASTM C1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces.
 - a. Basis of design product: Tremco, Trisotech Insulation.
 - b. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).
 - c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96) unless otherwise indicated.
- 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.8 ROOF INSULATION ACCESSORIES**A. Cover Board:**

1. Glass-mat-faced gypsum panel, primed, ASTM C1177/C1177M.
 - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
 - b. Thickness: 1/2 inch (12 mm).

B. Roof Insulation Adhesive for Concrete deck areas:

1. Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.
 - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
 - b. Flame Spread Index, ASTM E84: 10.
 - c. Smoke Developed Index, ASTM E84: 30.
 - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - e. Tensile Strength, minimum, ASTM D412: 250 psi (1724 kPa).
 - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.98 kN/m).
 - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.

C. Roof Insulation Adhesive for cementitious fiber decks:

1. Polyset CR-20 Low Rise Foam Insulation Adhesive

D. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.**2.9 WALKWAY MATERIALS****A. Walkway Material:**

1. Walkway roll, reinforced TPO membrane roll with serrated slip-resistant surface fabricated for heat welding to compatible TPO membrane surface.
 - a. Basis of design product: Tremco, TremPly TPO Walkway Roll.

- b. Roll Width: 34 inches x 50 ft (864 mm x 15.24m).
- c. Thickness: 0.125 inch (3.1 mm).
- d. Color: Gray.

2.10 ROOF EDGE WARNING STRIP

- A. Apply a visual safety warning line from roof manufacturer on top of TPO roofing 6 feet from open edge of roof perimeter.

- 1. Product:

- a. Tremco, AlphaGuard Bio -

- 1) strike a line 6 feet from open roof perimeter edge and apply a neat straight line 6" wide.
 - 2) Sand membrane with 38 grit sand paper.
 - 3) Prime membrane with Geogard Primer.
 - 4) Apply AlphaGuard Bio base coat.
 - 5) Apply AlphaGuard Bio top coat.

- b. John Mansville, JM Single Ply Safety Strip.

- c. Firestone, QuickSeam Yellow Safety Strip.

- d. Follow manufacturer's installation instructions.

- 2. Color: Safety Yellow

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

- 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and

terminations and that nailers match thicknesses of insulation.

3. Concrete Roof Deck:

- a. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
- b. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- c. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer, when tested according to ASTM F2170.
 - 1) Test Frequency: One test probe per each 1000 sq. ft. (93 sq. m), or portion thereof, of roof deck, with no fewer than three test probes.
 - 2) Submit test reports within 24 hours of performing tests.
- d. Test for moisture by pouring 1 pint (0.5 L) of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with roofing work if test sample foams or can be easily and cleanly stripped after cooling.
- e. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

4. Cementitious Wood Roof Deck: Verify that deck is sound and dry and securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other

construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Concrete Surface Priming: Prime surface of concrete deck with asphalt primer at rate required by manufacturer and allow primer to dry.

3.3 INSTALLATION, GENERAL

- A. Install roofing system in accordance with manufacturer's written instructions and approved details.
- B. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved details and perimeter fastening requirements of FM Global references if applicable.

3.4 VAPOR-RETARDER INSTALLATION ON CONCRETE DECK

- A. Vapor Retarder Installation, General: Completely seal vapor retarder/air barrier at terminations, obstructions, and penetrations to prevent air movement into roofing system. Seal vapor retarder/air barrier to air barrier in adjacent construction at perimeter of roofing system.
- B. Torch-Applied SBS Modified Sheet Vapor Retarder: Install one lapped vapor retarder course and torch-apply to substrate, according to roofing system manufacturer's written instructions.

3.5 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of

two times the roof slope and not less than 1/4 inch in 12 inches.

- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
1. Flat Insulation System on Sloped Roof Deck: Install insulation at minimum thickness as follows:
 - a. Minimum total thickness of Continuous Insulation: 5.2.
 - 1) Minimum thickness of base layer: 2.6.
 - 2) Minimum thickness of each subsequent layer: 2.6.
 - b. Minimum Continuous Insulation R-value: Not less than Insert (CI) R-value required.
 2. Tapered Insulation System for Flat Roof Deck: Install insulation as follows:
 - a. Minimum total thickness of Continuous Insulation: 5.2
 - 1) Minimum thickness of base layer: 2.6
 - 2) Minimum thickness of each subsequent layer: 2.6.
 - b. Minimum Continuous Insulation R-value: Not less than 30
 3. Insulation Drain Sumps: Tapered insulation sumps, not less than 8 by 8 feet, sloped to roof drain, with a minimum insulation thickness of not less than one inch less than the Project-stipulated continuous insulation thickness based upon code requirements.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

- G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
- H. Cover Boards: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
1. Secure cover boards to resist uplift pressure at corners, perimeter, and field of roof.
 2. Adhere cover boards by setting in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover board in place.

3.6 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Water-Based Bonding Adhesive: Apply to substrate at rate required by manufacturer. Install membrane immediately into adhesive, avoiding any air entrapment; do not allow adhesive to dry. Roll membrane into wet adhesive. Do not apply adhesive to splice area of membrane.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.7 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 5 full-time days on site to perform roof tests and inspections and to prepare start up, inter, imand final reports. Roofing Inspector's quality assurance inspections shall comply with applicable criteria established in NRCA's

"Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."

- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Where the extent of roof membrane patching of portions of the Project is significant and the need for this significant patching is due to the Contractor's means and methods, skill and labor, equipment operations, sequence of trades, lack of temporary protective facilities and/or other actions during the performance of the work, then the significant patching shall be replaced with new work.
 - 1. The Consultant will determine if patching must be replaced with new work using the following process.
 - a. Step 1: The Consultant will evaluate the risks associated with the Patching (such as water or water vapor infiltration into the work), the esthetic impact of visible Patching, the impact that Patching has on future maintenance, custodial or other campus operations and/or other objective criteria that it may deem reasonable during the evaluation of the Patching. Based on this evaluation, the Consultant may recommend moving on to Step 2.

- b. Step 2: The Consultant will count and measure the amount of Patching using the most reasonable unit of measurement applicable. The sum of these counts and measurements will be the total amount of Patching.
 - 1) The Consultant will determine the overall limits (Limits) of the portion of the Project with the Patching. The Limits will include all the Patching counted and measured above plus reasonably adjacent portions of the Project that may be without Patching.
 - 2) The Consultant will measure the Limits using same unit of measurement used to measure the Patching. This quantity will define the extent of the Limits of the portion of the Project with the Patching.
 - 3) Using the figures calculated above, the Consultant determines the number of Patches and the percentage of Patching that exists within the Limits. The work within Limits shall be replaced with new work if:
 - 4) If the number count of Patches within the Limits exceeds 2 (two) per 100 (one hundred) square feet (or other appropriate unit of measurement), or
 - 5) If the percentage of Patching exceeds 15% (fifteen percent) within Limits.
 - 2. The Consultant will determine the reasonable extent and type of work required to replace the Patching and issued detailed drawings and instructions to the Contractor for its use in completing the corrective work.
- D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 23a

SECTION 07 54 23b
THERMOPLASTIC POLYOLEFIN (TPO) ROOFING - Faculty Office Building

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system on wood deck, including:
2. Roof insulation.
3. Roof insulation cover board.
4. Walkway material.
5. Roof edge warning strip.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect,, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative,, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review drawings and specifications.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 1. Base flashings and membrane terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 2. Tapered insulation, including slopes and crickets.
 3. Roof plan showing types and orientation of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing if applicable.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
 2. Walkway pads or rolls.
 3. Metal termination bars.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer and Roofing Inspector.
 - 1. Include letter from Manufacturer written for this Project indicating approval of Installer.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
 - 2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing membrane, flashing sheets, adhesives, and sealants.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- E. Warranties: Unexecuted sample copies of special warranties.
- F. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
 - 1. Submit reports within 72 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

- A. Executed copies of warranties.
- B. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate

verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

- B. Manufacturer Qualifications: Approved manufacturer listed in this Section, UL listed for roofing systems comparable to that specified for this Project, with minimum five years' experience in manufacture of thermoplastic roof membrane products in successful use in similar applications.
1. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:
 - a. Written explanation of why the substitute system should be considered.
 - b. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.
 - c. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
 - d. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
 - e. List minimum five (5) roofing projects, installed within 50 miles of New Paltz, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.
 - f. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.

- g. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
 - h. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre- approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.
- 2. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
 - 1. An authorized full-time technical employee of the manufacturer.
 - 2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site access to manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT / FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3. Remove temporary plugs from roof drains at end of each day.
 - 4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
 - 1. Form of Warranty: Manufacturer's standard warranty form.
 - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 - 3. Warranty Period: 20 years from date of completion.

- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
 - 1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
 - 1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 - 2. Scope of Warranty: Work of this Section.
 - 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
 - 1. Johns Manville.
 - 2. Firestone Building Products.
- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 10,000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746/C 3746M, ASTM D 4272/D

4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

- B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and applicable code.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1.
 - 1. Design Pressure: As indicated on Drawings.
- D. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 - 1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 - 2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- E. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 MATERIALS, GENERAL

- A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- B. FM Global Standards: Roofing, base flashings, and component materials shall be identical to materials that comply with requirements in FM Global 4470 as part of a roofing system

listed or approved by FM Global. Identify applicable materials with FM Global markings.

2.4 THERMOPLASTIC MEMBRANE MATERIALS

A. TPO Roof Membrane:

1. Thermoplastic Polyolefin (TPO) Sheet: Internally fabric reinforced and fleece-backed, ASTM D6878.
 - a. Basis of design product: Tremco, TremPly Max TPO FB Single Ply Roof Membrane.
 - b. Breaking Strength, ASTM D751, for 50 mil sheet: 375 lbf (65 k/Nm) by 330 lbf (57 kN/m) .
 - c. Tear Strength, ASTM D751: 70 lbf (12 k/Nm) by 130 lbf (22 k/Nm).
 - d. Elongation at Break, ASTM D751: 30 percent.
 - e. Membrane Thickness, nominal: 60 mils (1.5 mm).
 - f. Exposed Face Color: Gray.
 - g. Solar Reflectance Index (SRI) ASTM E1980: 87 (Gray, Initial).

B. Sheet Flashing: Manufacturer's standard smooth-backed sheet flashing of same material, type, reinforcement, thickness, and color as TPO sheet membrane.

2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Single-Ply Roof Membrane Sealants: 450 g/L.
 - c. Nonmembrane Roof Sealants: 300 g/L.

- d. Sealant Primers for Nonporous Substrates: 250 g/L.
- e. Sealant Primers for Porous Substrates: 775 g/L.
- 3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Membrane Bonding Adhesive:
 - 1. Bonding adhesive, water-based acrylic emulsion, low-VOC, for bonding TPO single ply smooth and fleece-backed membranes and flashings to substrates.
 - a. Basis of design product: Tremco, TremPly TPO WB Bonding Adhesive.
 - b. VOC, maximum, ASTM D3960: <10 g/L.
- C. Flashing Membrane Adhesive: Same as membrane bonding adhesive.
 - 1. [Click here to select flashing membrane adhesive.](#)
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.
- E. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch (25 mm wide by 1.3 mm) thick, prepunched.
- F. Ballast Retaining Bar: Perimeter securement system consisting of a slotted extruded-aluminum retention bar with an integrated compression fastening strip.
 - 1. Fasteners: 1-1/2-inch (38-mm) stainless steel fasteners with neoprene washers.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to membrane roofing system manufacturer.
- H. Fasteners, Induction Welding System: Factory-coated FM Global approved drill point steel fasteners for insulation and membrane attachment to wood, steel and structural concrete roof decks, separation pads, and polyester-backed, adhesive-coated metal

stress plates approved for bonding to roofing membrane using welding method described in Part 3, complying with corrosion-resistance provisions in FM Global 4470, and acceptable to membrane roofing system manufacturer.

- I. Termination Joint Sealant: Silicone, S, NS, 25 or 50, NT: Single-component, nonsag, plus 25 to 50 percent and minus 25 to 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, and compatible with adjacent materials.
- J. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- K. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.6 ROOF INSULATION MATERIALS

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from insulation manufacturer's standard sizes, suitable for application, and of thicknesses indicated.
 - 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, not less than two times the roof slope.
- B. Roof Insulation: Provide roof insulation product in thicknesses indicated in Part 3 as follows:
 - 1. Polyisocyanurate board insulation, ASTM C1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces.
 - a. Basis of design product: Tremco, Trisotech Insulation.
 - b. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).
 - c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96) unless otherwise indicated.

1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 ROOF INSULATION ACCESSORIES

A. Cover Board:

1. Glass-mat-faced gypsum panel, primed, ASTM C1177/C1177M.
 - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
 - b. Thickness: 1/2 inch (12 mm).

B. Roof Insulation Adhesive:

1. Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.
 - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
 - b. Flame Spread Index, ASTM E84: 10.
 - c. Smoke Developed Index, ASTM E84: 30.
 - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - e. Tensile Strength, minimum, ASTM D412: 250 psi (1724 kPa).
 - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.98 kN/m).
 - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.

C. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

D. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

E. Insulation Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

2.8 WALKWAY MATERIALS**A. Walkway Material:**

1. Walkway roll, reinforced TPO membrane roll with serrated slip-resistant surface fabricated for heat welding to compatible TPO membrane surface.
 - a. Basis of design product: Tremco, TremPly TPO Walkway Roll.
 - b. Roll Width: 34 inches x 50 ft (864 mm x 15.24m).
 - c. Thickness: 0.125 inch (3.1 mm).
 - d. Color: Gray.

2.9 ROOF EDGE WARNING STRIP**A. Apply a visual safety warning line from roof manufacturer on top of TPO roofing 6 feet from open edge of roof perimeter.****1. Product:**

- a. Tremco, AlphaGuard Bio -
 - 1) strike a line 6 feet from open roof perimeter edge and apply a neat straight line 6" wide.
 - 2) Sand membrane with 38 grit sand paper.
 - 3) Prime membrane with Geogard Primer.
 - 4) Apply AlphaGuard Bio base coat.
 - 5) Apply AlphaGuard Bio top coat.
- b. John Mansville, JM Single Ply Safety Strip.
- c. Firestone, QuickSeam Yellow Safety Strip.
- d. Follow manufacturer's installation instructions.

2. Color: Safety Yellow

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Wood Roof Deck: Verify that deck is sound and dry and securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSTALLATION, GENERAL

- A. Install roofing system in accordance with manufacturer's written instructions and approved details.
- B. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved

details and perimeter fastening requirements of FM Global references if applicable.

3.4 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope and not less than 1/4 inch in 12 inches.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
 - 1. Tapered Insulation System for Flat Roof Deck: Install insulation as follows:
 - a. Minimum total thickness of Continuous Insulation: . 5.2
 - 1) Minimum thickness of base layer: . 2.6
 - 2) Minimum thickness of each subsequent layer: 2.6.
 - b. Minimum Continuous Insulation R-value: Not less than. 30
 - 2. Insulation Drain Sumps: Tapered insulation sumps, not less than 8 by 8 feet, sloped to roof drain, with a minimum insulation thickness of not less than one inch less than the Project-stipulated continuous insulation thickness based upon code requirements.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows,

abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

H. Cover Boards: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.

1. Secure cover boards to resist uplift pressure at corners, perimeter, and field of roof.
2. Adhere cover boards by setting in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover board in place.

3.5 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Water-Based Bonding Adhesive: Apply to substrate at rate required by manufacturer. Install membrane immediately into adhesive, avoiding any air entrapment; do not allow adhesive to dry. Roll membrane into wet adhesive. Do not apply adhesive to splice area of membrane.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 3 full-time days on site to perform roof tests and inspections and to prepare start up, inter, imand final reports. Roofing Inspector's quality assurance inspections shall comply with applicable criteria established in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Where the extent of roof membrane patching of portions of the Project is significant and the need for this significant patching is due to the Contractor's means and methods, skill and labor, equipment operations, sequence of trades, lack of temporary protective facilities and/or other actions during the performance of the work, then the significant patching shall be replaced with new work.
 - 1. The Consultant will determine if patching must be replaced with new work using the following process.

- a. Step 1: The Consultant will evaluate the risks associated with the Patching (such as water or water vapor infiltration into the work), the esthetic impact of visible Patching, the impact that Patching has on future maintenance, custodial or other campus operations and/or other objective criteria that it may deem reasonable during the evaluation of the Patching. Based on this evaluation, the Consultant may recommend moving on to Step 2.
- b. Step 2: The Consultant will count and measure the amount of Patching using the most reasonable unit of measurement applicable. The sum of these counts and measurements will be the total amount of Patching.
 - 1) The Consultant will determine the overall limits (Limits) of the portion of the Project with the Patching. The Limits will include all the Patching counted and measured above plus reasonably adjacent portions of the Project that may be without Patching.
 - 2) The Consultant will measure the Limits using same unit of measurement used to measure the Patching. This quantity will define the extent of the Limits of the portion of the Project with the Patching.
 - 3) Using the figures calculated above, the Consultant determines the number of Patches and the percentage of Patching that exists within the Limits. The work within Limits shall be replaced with new work if:
 - 4) If the number count of Patches within the Limits exceeds 2 (two) per 100 (one hundred) square feet (or other appropriate unit of measurement), or
 - 5) If the percentage of Patching exceeds 15% (fifteen percent) within Limits.
2. The Consultant will determine the reasonable extent and type of work required to replace the Patching and issued detailed drawings and instructions to the Contractor for its use in completing the corrective work.
- D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 23b

SECTION 07 54 23c
THERMOPLASTIC POLYOLEFIN (TPO) ROOFING - Smiley Arts

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system on concrete deck, including:
2. Vapor retarder.
3. Roof insulation.
4. Roof insulation cover board.
5. Walkway material.
6. Roof edge warning strip.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect,, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative,, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review drawings and specifications.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel,

equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 1. Base flashings and membrane terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 2. Tapered insulation, including slopes and crickets.
 3. Roof plan showing types and orientation of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing if applicable.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
 2. Walkway pads or rolls.

3. Metal termination bars.

- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

- B. Qualification Data: For Installer, Manufacturer and Roofing Inspector.

1. Include letter from Manufacturer written for this Project indicating approval of Installer.

- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of compliance with performance requirements.

2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing membrane, flashing sheets, adhesives, and sealants.

- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

- E. Warranties: Unexecuted sample copies of special warranties.

- F. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1. Submit reports within 72 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

- A. Executed copies of warranties.

- B. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section, UL listed for roofing systems comparable to that specified for this Project, with minimum five years' experience in manufacture of thermoplastic roof membrane products in successful use in similar applications.
- C. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:
 - 1. Written explanation of why the substitute system should be considered.
 - 2. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.
 - 3. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
 - 4. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
 - 5. List minimum five (5) roofing projects, installed within 50 miles of New Paltz, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.

6. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.
 7. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
 8. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre- approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.
- D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.
 2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.
- E. Manufacturer's Installation Instructions: Obtain and maintain on-site access to manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
 - B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT / FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3. Remove temporary plugs from roof drains at end of each day.
 - 4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
 - 1. Form of Warranty: Manufacturer's standard warranty form.
 - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 - 3. Warranty Period: 20 years from date of completion.

- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 2. Scope of Warranty: Work of this Section.
 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
1. Johns Manville.
 2. Firestone Building Products.
- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
1. Accelerated Weathering: Roofing system shall withstand 10,000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746/C 3746M, ASTM D 4272/D 4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and applicable code.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1.
 1. Design Pressure: As indicated on Drawings.
- D. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 1. FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.
 2. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 3. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- E. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 MATERIALS, GENERAL

- A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of

service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

2.4 THERMOPLASTIC MEMBRANE MATERIALS

A. TPO Roof Membrane:

1. Thermoplastic Polyolefin (TPO) Sheet: Internally fabric reinforced and fleece-backed, ASTM D6878.
 - a. Basis of design product: Tremco, TremPly Max TPO FB Single Ply Roof Membrane.
 - b. Breaking Strength, ASTM D751, for 50 mil sheet: 375 lbf (65 k/Nm) by 330 lbf (57 kN/m) .
 - c. Tear Strength, ASTM D751: 70 lbf (12 k/Nm) by 130 lbf (22 k/Nm).
 - d. Elongation at Break, ASTM D751: 30 percent.
 - e. Membrane Thickness, nominal: 60 mils (1.5 mm).
 - f. Exposed Face Color: Gray.
 - g. Solar Reflectance Index (SRI) ASTM E1980: 87 (Gray, Initial).

- B. Sheet Flashing: Manufacturer's standard smooth-backed sheet flashing of same material, type, reinforcement, thickness, and color as TPO sheet membrane.

2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Single-Ply Roof Membrane Sealants: 450 g/L.

- c. Nonmembrane Roof Sealants: 300 g/L.
 - d. Sealant Primers for Nonporous Substrates: 250 g/L.
 - e. Sealant Primers for Porous Substrates: 775 g/L.
- B. Membrane Bonding Adhesive:
- 1. Bonding adhesive, water-based acrylic emulsion, low-VOC, for bonding TPO single ply smooth and fleece-backed membranes and flashings to substrates.
 - a. Basis of design product: Tremco, TremPly TPO WB Bonding Adhesive.
 - b. VOC, maximum, ASTM D3960: <10 g/L.
- C. Flashing Membrane Adhesive: Same as membrane bonding adhesive.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to membrane roofing system manufacturer.
- F. Termination Joint Sealant: Silicone, S, NS, 25 or 50, NT: Single-component, nonsag, plus 25 to 50 percent and minus 25 to 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, and compatible with adjacent materials.
- G. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.
- 2.6 VAPOR RETARDER**
- A. Vapor Retarder Membrane:
- 1. SBS/SIS/SEBS-modified asphalt-coated glass-fiber reinforced sheet, smooth surfaced, designed for heat-welded applications, ASTM D6163 Type I Grade S.

- a. Basis of design product: Tremco, POWERply Standard Smooth HW (Heat Weld).
- b. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: 70 lbf/in (12 kN/m) machine direction; 50 lbf/in (8 kN/m) cross-machine direction.
- c. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: 100 lbf (445 N) machine direction; 80 lbf (400 N) machine direction.
- d. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D5147: 4 percent machine direction; 4 percent cross-machine direction.
- e. Low Temperature Flex, ASTM D5147: -30 deg. F (-23 deg. C).
- f. Thickness, ASTM D5147: 0.118 inch (3.0 mm).

B. Vapor Retarder Primer:

1. Asphalt primer, water-based, polymer modified.
 - a. Basis of design product: Tremco, TREMprime WB.
 - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 2 g/L.
 - c. Colour: Brown/black.

2.7 ROOF INSULATION MATERIALS

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from insulation manufacturer's standard sizes, suitable for application, and of thicknesses indicated.
1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- B. Roof Insulation: Provide roof insulation product in thicknesses indicated in Part 3 as follows:
1. Polyisocyanurate board insulation, ASTM C1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces.
 - a. Basis of design product: Tremco, Trisotech Insulation.

- b. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).
 - c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96) unless otherwise indicated.
- 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.8 ROOF INSULATION ACCESSORIES

A. Cover Board:

- 1. Glass-mat-faced gypsum panel, primed, ASTM C1177/C1177M.
 - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
 - b. Thickness: 1/2 inch (12 mm).

B. Roof Insulation Adhesive:

- 1. Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.
 - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
 - b. Flame Spread Index, ASTM E84: 10.
 - c. Smoke Developed Index, ASTM E84: 30.
 - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - e. Tensile Strength, minimum, ASTM D412: 250 psi (1724 kPa).
 - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.98 kN/m).
 - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.

- C. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- D. Wood Cant Strips: Comply with requirements in Division 06 rough carpentry Section.
- E. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- F. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

2.9 WALKWAY MATERIALS

- A. Walkway Material:
 - 1. Walkway roll, reinforced TPO membrane roll with serrated slip-resistant surface fabricated for heat welding to compatible TPO membrane surface.
 - a. Basis of design product: Tremco, TremPly TPO Walkway Roll.
 - b. Roll Width: 34 inches x 50 ft (864 mm x 15.24m).
 - c. Thickness: 0.125 inch (3.1 mm).
 - d. Color: Gray.

2.10 ROOF EDGE WARNING STRIP

- A. Apply a visual safety warning line from roof manufacturer on top of TPO roofing 6 feet from open edge of roof perimeter.
 - 1. Product:
 - a. Tremco, AlphaGuard Bio -
 - 1) strike a line 6 feet from open roof perimeter edge and apply a neat straight line 6" wide.
 - 2) Sand membrane with 38 grit sand paper.
 - 3) Prime membrane with Geogard Primer.
 - 4) Apply AlphaGuard Bio base coat.
 - 5) Apply AlphaGuard Bio top coat.

- b. John Mansville, JM Single Ply Safety Strip.
 - c. Firestone, QuickSeam Yellow Safety Strip.
 - d. Follow manufacturer's installation instructions.
2. Color: Safety Yellow

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
- 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Concrete Roof Deck:
 - a. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - b. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - c. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer, when tested according to ASTM F2170.
 - 1) Test Frequency: One test probe per each 1000 sq. ft. (93 sq. m), or portion thereof, of roof deck, with no fewer than three test probes.
 - 2) Submit test reports within 24 hours of performing tests.
 - d. Test for moisture by pouring 1 pint (0.5 L) of hot roofing asphalt on deck at start of each day's work and

at start of each roof area or plane. Do not proceed with roofing work if test sample foams or can be easily and cleanly stripped after cooling.

- e. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Concrete Surface Priming: Prime surface of concrete deck with asphalt primer at rate required by manufacturer and allow primer to dry.

3.3 INSTALLATION, GENERAL

- A. Install roofing system in accordance with manufacturer's written instructions and approved details.
- B. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved details and perimeter fastening requirements of FM Global references if applicable.

3.4 VAPOR-RETARDER INSTALLATION

- A. Vapor Retarder Installation, General: Completely seal vapor retarder/air barrier at terminations, obstructions, and penetrations to prevent air movement into roofing system. Seal vapor retarder/air barrier to air barrier in adjacent construction at perimeter of roofing system.

- B. Torch-Applied SBS Modified Sheet Vapor Retarder: Install one lapped vapor retarder course and torch-apply to substrate, according to roofing system manufacturer's written instructions.
- C. Prime concrete deck with manufacturer's recommended primer.

3.5 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope and not less than 1/4 inch in 12 inches.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
 - 1. Tapered Insulation System for Flat Roof Deck: Install insulation as follows:
 - a. Minimum total thickness of Continuous Insulation: . 5.2
 - 1) Minimum thickness of base layer: . 2.6
 - 2) Minimum thickness of each subsequent layer: 2.6.
 - b. Minimum Continuous Insulation R-value: Not less than.
30
 - 2. Insulation Drain Sumps: Tapered insulation sumps, not less than 8 by 8 feet, sloped to roof drain, with a minimum insulation thickness of not less than one inch less than the Project-stipulated continuous insulation thickness based upon code requirements.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
- H. Cover Boards: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
 - 1. Secure cover boards to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Adhere cover boards by setting in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover board in place.

3.6 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Water-Based Bonding Adhesive: Apply to substrate at rate required by manufacturer. Install membrane immediately into adhesive, avoiding any air entrapment; do not allow adhesive to dry. Roll membrane into wet adhesive. Do not apply adhesive to splice area of membrane.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.7 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 4 full-time days on site to perform roof tests and inspections and to prepare start up, inter, imand final reports. Roofing Inspector's quality assurance inspections shall comply with applicable criteria established in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Where the extent of roof membrane patching of portions of the Project is significant and the need for this significant patching is due to the Contractor's means and methods, skill and labor, equipment operations, sequence of trades, lack of temporary protective facilities and/or other actions during the performance of the work, then the significant patching shall be replaced with new work.
 - 1. The Consultant will determine if patching must be replaced with new work using the following process.

- a. Step 1: The Consultant will evaluate the risks associated with the Patching (such as water or water vapor infiltration into the work), the esthetic impact of visible Patching, the impact that Patching has on future maintenance, custodial or other campus operations and/or other objective criteria that it may deem reasonable during the evaluation of the Patching. Based on this evaluation, the Consultant may recommend moving on to Step 2.
- b. Step 2: The Consultant will count and measure the amount of Patching using the most reasonable unit of measurement applicable. The sum of these counts and measurements will be the total amount of Patching.
 - 1) The Consultant will determine the overall limits (Limits) of the portion of the Project with the Patching. The Limits will include all the Patching counted and measured above plus reasonably adjacent portions of the Project that may be without Patching.
 - 2) The Consultant will measure the Limits using same unit of measurement used to measure the Patching. This quantity will define the extent of the Limits of the portion of the Project with the Patching.
 - 3) Using the figures calculated above, the Consultant determines the number of Patches and the percentage of Patching that exists within the Limits. The work within Limits shall be replaced with new work if:
 - 4) If the number count of Patches within the Limits exceeds 2 (two) per 100 (one hundred) square feet (or other appropriate unit of measurement), or
 - 5) If the percentage of Patching exceeds 15% (fifteen percent) within Limits.
2. The Consultant will determine the reasonable extent and type of work required to replace the Patching and issued detailed drawings and instructions to the Contractor for its use in completing the corrective work.
- D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 23c

SECTION 07 54 23d
THERMOPLASTIC POLYOLEFIN (TPO) ROOFING - Dorsky Museum

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system on metal deck, including:
2. Roof insulation.
3. Roof insulation cover board.
4. Walkway material.
5. Roof edge warning strip.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect,, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative,, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review drawings and specifications.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 1. Base flashings and membrane terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 2. Tapered insulation, including slopes and crickets.
 3. Roof plan showing types and orientation of roof deck and orientation of membrane roofing and fastening spacings and patterns for mechanically fastened membrane roofing if applicable.
 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
 2. Walkway pads or rolls.
 3. Metal termination bars.

- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer and Roofing Inspector.
 - 1. Include letter from Manufacturer written for this Project indicating approval of Installer.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
 - 2. Product Compatibility: Indicate manufacturer has verified compatibility of roofing system components, including but not limited to: Roofing membrane, flashing sheets, adhesives, and sealants.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- E. Warranties: Unexecuted sample copies of special warranties.
- F. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
 - 1. Submit reports within 72 hours after inspection.

1.6 CLOSEOUT SUBMITTALS

- A. Executed copies of warranties.
- B. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section, UL listed for roofing systems comparable to that specified for this Project, with minimum five years' experience in manufacture of thermoplastic roof membrane products in successful use in similar applications.
- C. If Contractor chooses to bid a substitute system, Contractor must bid specified system and submit separate bid for the substitute system. Substitute system must be identified publicly during the pre-bid conference to give all bidders equal opportunity. Bidding contractors proposing substitutes shall submit the following to Architect a minimum of 10 (ten) business days prior to bid date:
 - 1. Written explanation of why the substitute system should be considered.
 - 2. Accredited third-party testing certifications showing that the physical and performance characteristics of the substitute system's products will meet or exceed those of the specified materials.
 - 3. Printout of current UL assembly approval, meeting or exceeding specified wind uplift and fire rating requirements, showing exact proposed substitute materials.
 - 4. A written summary sheet showing a comparison of physical properties all of the specified products against the proposed substitute products; including printed versions of all manufacturers' current product data sheets for all products being proposed or compared in the required summary.
 - 5. List minimum five (5) roofing projects, installed within 50 miles of New Paltz, NY project site, using the exact combination of proposed substitute materials. Include all project contact information including project size, names, addresses and contact phone numbers of Owners and Architects involved. Include copies of current warranties for verification.

6. Smallest standard package of, and product data sheets for, all proposed substitute adhesives, mastics, sealants, ply sheets and flashings.
 7. Any proposed substitute system that the Architect deems as qualified to compete for the project will be acknowledged by written addendum before the bid date.
 8. Voluntary alternate roofing systems submitted by the low bid Contractor, without pre- approval acknowledged by the Architect through the published addendum process, may be rejected without cause by the Owner's Representative.
- D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.
 2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.
- E. Manufacturer's Installation Instructions: Obtain and maintain on-site access to manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
 - B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT / FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3. Remove temporary plugs from roof drains at end of each day.
 - 4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

- A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.
 - 1. Form of Warranty: Manufacturer's standard warranty form.
 - 2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.
 - 3. Warranty Period: 20 years from date of completion.

- B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
 - 1. Inspections to occur in following years: 2, 5, 10, 15 following completion.
- C. Installer Warranty: Installer's warranty signed by Installer, as follows.
 - 1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.
 - 2. Scope of Warranty: Work of this Section.
 - 3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products or comparable products of one of the following.
 - 1. Johns Manville.
 - 2. Firestone Building Products.
- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 10,000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746/C 3746M, ASTM D 4272/D 4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and applicable code.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1.
 1. Design Pressure: As indicated on Drawings.
- D. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- E. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 MATERIALS, GENERAL

- A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

2.4 THERMOPLASTIC MEMBRANE MATERIALS**A. TPO Roof Membrane:**

1. Thermoplastic Polyolefin (TPO) Sheet: Internally fabric reinforced and fleece-backed, ASTM D6878.
 - a. Basis of design product: Tremco, TremPly Max TPO FB Single Ply Roof Membrane.
 - b. Breaking Strength, ASTM D751, for 50 mil sheet: 375 lbf (65 k/Nm) by 330 lbf (57 kN/m) .
 - c. Tear Strength, ASTM D751: 70 lbf (12 k/Nm) by 130 lbf (22 k/Nm).
 - d. Elongation at Break, ASTM D751: 30 percent.
 - e. Membrane Thickness, nominal: 60 mils (1.5 mm).
 - f. Exposed Face Color: Gray.
 - g. Solar Reflectance Index (SRI) ASTM E1980: 87 (Gray, Initial).

- B. Sheet Flashing: Manufacturer's standard smooth-backed sheet flashing of same material, type, reinforcement, thickness, and color as TPO sheet membrane.

2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Plastic Foam Adhesives: 50 g/L.
 - b. Single-Ply Roof Membrane Sealants: 450 g/L.
 - c. Nonmembrane Roof Sealants: 300 g/L.
 - d. Sealant Primers for Nonporous Substrates: 250 g/L.

- e. Sealant Primers for Porous Substrates: 775 g/L.
- B. Membrane Bonding Adhesive:
 - 1. Bonding adhesive, water-based acrylic emulsion, low-VOC, for bonding TPO single ply smooth and fleece-backed membranes and flashings to substrates.
 - a. Basis of design product: Tremco, TremPly TPO WB Bonding Adhesive.
 - b. VOC, maximum, ASTM D3960: <10 g/L.
- C. Flashing Membrane Adhesive: Same as membrane bonding adhesive.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to membrane roofing system manufacturer.
- F. Termination Joint Sealant: Silicone, S, NS, 25 or 50, NT: Single-component, nonsag, plus 25 to 50 percent and minus 25 to 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT, and compatible with adjacent materials.
- G. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.6 ROOF INSULATION MATERIALS

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from insulation manufacturer's standard sizes, suitable for application, and of thicknesses indicated.
 - 1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

- B. Roof Insulation: Provide roof insulation product in thicknesses indicated in Part 3 as follows:
1. Polyisocyanurate board insulation, ASTM C1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces.
 - a. Basis of design product: Tremco, Trisotech Insulation.
 - b. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).
 - c. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96) unless otherwise indicated.
1. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 ROOF INSULATION ACCESSORIES

- A. Cover Board:
1. Glass-mat-faced gypsum panel, primed, ASTM C1177/C1177M.
 - a. Basis of design product: Tremco/GP Gypsum DensDeck Prime.
 - b. Thickness: 1/2 inch (12 mm).
- B. Roof Insulation Adhesive:
1. Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.
 - a. Basis of design product: Tremco, Low Rise Foam Insulation Adhesive.
 - b. Flame Spread Index, ASTM E84: 10.
 - c. Smoke Developed Index, ASTM E84: 30.
 - d. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.

- e. Tensile Strength, minimum, ASTM D412: 250 psi (1724 kPa).
 - f. Peel Adhesion, minimum, ASTM D903: 17 lbf/in (2.98 kN/m).
 - g. Flexibility, 70 deg. F (39 deg. C), ASTM D816: Pass.
- C. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- D. Insulation Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

2.8 WALKWAY MATERIALS

- A. Walkway Material:
- 1. Walkway roll, reinforced TPO membrane roll with serrated slip-resistant surface fabricated for heat welding to compatible TPO membrane surface.
 - a. Basis of design product: Tremco, TremPly TPO Walkway Roll.
 - b. Roll Width: 34 inches x 50 ft (864 mm x 15.24m).
 - c. Thickness: 0.125 inch (3.1 mm).
 - d. Color: Gray.

2.9 ROOF EDGE WARNING STRIP

- A. Apply a visual safety warning line from roof manufacturer on top of TPO roofing 6 feet from open edge of roof perimeter.
- 1. Product:
 - a. Tremco, AlphaGuard Bio -
 - 1) strike a line 6 feet from open roof perimeter edge and apply a neat straight line 6" wide.
 - 2) Sand membrane with 38 grit sand paper.
 - 3) Prime membrane with Geogard Primer.

- 4) Apply AlphaGuard Bio base coat.
 - 5) Apply AlphaGuard Bio top coat.
 - b. John Mansville, JM Single Ply Safety Strip.
 - c. Firestone, QuickSeam Yellow Safety Strip.
 - d. Follow manufacturer's installation instructions.
2. Color: Safety Yellow

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Steel Roof Deck:
 - a. Verify that deck is securely fastened and properly supported with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other

construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSTALLATION, GENERAL

- A. Install roofing system in accordance with manufacturer's written instructions and approved details.
- B. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved details and perimeter fastening requirements of FM Global references if applicable.

3.4 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope and not less than 1/4 inch in 12 inches.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
 - 1. Tapered Insulation System for Flat Roof Deck: Install insulation as follows:
 - a. Minimum total thickness of Continuous Insulation:. 5.2

- 1) Minimum thickness of base layer:. 2.6

- 2) Minimum thickness of each subsequent layer: 2.6.
- b. Minimum Continuous Insulation R-value: Not less than.
30
2. Insulation Drain Sumps: Tapered insulation sumps, not less than 8 by 8 feet, sloped to roof drain, with a minimum insulation thickness of not less than one inch less than the Project-stipulated continuous insulation thickness based upon code requirements.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- H. Cover Boards: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
 1. Secure cover boards to resist uplift pressure at corners, perimeter, and field of roof.
 2. Adhere cover boards by setting in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover board in place.

3.5 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.

- B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Water-Based Bonding Adhesive: Apply to substrate at rate required by manufacturer. Install membrane immediately into adhesive, avoiding any air entrapment; do not allow adhesive to dry. Roll membrane into wet adhesive. Do not apply adhesive to splice area of membrane.
- E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
- H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of 2 full-time days on site to perform roof tests and inspections and to prepare start up, inter, imand final reports. Roofing Inspector's quality assurance inspections shall comply with applicable criteria established in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair

or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Where the extent of roof membrane patching of portions of the Project is significant and the need for this significant patching is due to the Contractor's means and methods, skill and labor, equipment operations, sequence of trades, lack of temporary protective facilities and/or other actions during the performance of the work, then the significant patching shall be replaced with new work.

1. The Consultant will determine if patching must be replaced with new work using the following process.

a. Step 1: The Consultant will evaluate the risks associated with the Patching (such as water or water vapor infiltration into the work), the esthetic impact of visible Patching, the impact that Patching has on future maintenance, custodial or other campus operations and/or other objective criteria that it may deem reasonable during the evaluation of the Patching. Based on this evaluation, the Consultant may recommend moving on to Step 2.

b. Step 2: The Consultant will count and measure the amount of Patching using the most reasonable unit of measurement applicable. The sum of these counts and measurements will be the total amount of Patching.

1) The Consultant will determine the overall limits (Limits) of the portion of the Project with the Patching. The Limits will include all the Patching counted and measured above plus reasonably adjacent portions of the Project that may be without Patching.

2) The Consultant will measure the Limits using same unit of measurement used to measure the Patching. This quantity will define the extent of the Limits of the portion of the Project with the Patching.

3) Using the figures calculated above, the Consultant determines the number of Patches and the percentage of Patching that exists within the Limits. The work within Limits shall be replaced with new work if:

- 4) If the number count of Patches within the Limits exceeds 2 (two) per 100 (one hundred) square feet (or other appropriate unit of measurement), or
 - 5) If the percentage of Patching exceeds 15% (fifteen percent) within Limits.
2. The Consultant will determine the reasonable extent and type of work required to replace the Patching and issued detailed drawings and instructions to the Contractor for its use in completing the corrective work.
- D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 23d

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all flashing, trim and sheet metal Work as indicated on the Drawings, as required for the completed Work, and as specified herein. The Work shall include, but shall not be limited to, the following:
1. Roof Flashings (various types)
 2. Wall Flashings (various types)
 3. Shop-Formed Gravel Stops
 4. Shop-Formed Copings
 5. Flashing at expansion joints
 6. Extruded Aluminum Gravel Stops
 7. Gutters and Downspouts
 8. Flashing at roof mounted equipment and roof penetrations.

1.02 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
- C. Copper Development Association (CDA).
- D. American Society for Testing and Materials (ASTM).

1.03 SUBMITTALS**A. Shop Drawings**

1. Show the manner of forming, jointing, and securing the metal flashings, trim, and other specified sheet metal items. Include expansion joint connections, and the method of forming waterproof connections to adjoining construction.
2. Submit roof plan indicating layout and spacing of snow guards as recommended by the snow guard manufacturer. Include half-full size detail of snow guard type and method of attachment.

B. Product Data

1. Catalog sheets, specifications, installation instructions for each item specified except for shop or job formed items, solder and flux.

C. Samples

1. Materials for Flashings: One 6" sq piece, for each type material specified.
2. Anchors: Two, each type required.
3. Cap Flashings: Full section, 6" long.
4. Gravel Stop: Full section 6" long.
5. Coping: Full section, 12" long.
6. Gutters: Full section, 12" long.
7. Downspout: Full section, 12" long.
8. Termination bar, 12" section. Termination bar fasteners, stainless steel, 3 of each type. Termination bar sealant, 1 container.

D. Guarantee

- E. Certificates of qualifications as specified under Article titled "Quality Assurance".

F. Product Certificates

Certify that materials of this Section, such as copper/fabric flashing, sealants, termination bar, and fasteners, are compatible with all components of the air barrier system and other Project materials that contact them.

1.04 QUALITY ASSURANCE

A. Except as otherwise shown or specified, comply with applicable recommendations, details, and standards of CDA, and SMACNA.

B. All metal Work shall be ink-stamped at intervals, identifying

Manufacturer, type metal, and gage or thickness.

C. Manufacturer's Recommendations

For factory fabricated items, follow the manufacturer's recommendations and installation instructions unless specifically shown or specified otherwise.

D. Materials containing asbestos are prohibited.

E. Project Foreman Qualifications

1. Successful completion of a formal instructional and training program for the installation of the specified roofing/flashing systems, as evidenced by:

a. A certificate of journeyman roofer as issued under a union apprenticeship-journeyman training program duly registered with the New York State Department of Labor (or other State Labor Department); or

b. A certificate or diploma issued by a vocational training school or national roofing manufacturer attesting to successful completion of an equivalent formal training

program. (Submit copy of certificate for above).

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products of this Section in such manner to protect them from damage.

1.06 PROJECT CONDITIONS

- A. Do not execute the Work of this Section unless the Authority's Representative is present, unless otherwise directed.
- B. Make the roof and all uncompleted flashings watertight at the end of each work day.

1.07 GUARANTEE

- A. The Contractor shall provide a two (2) year written guarantee, covering the flashing and sheet metal materials and workmanship. Should any defects occur during the stated period, they shall be corrected immediately, and all damage caused by such defects shall be corrected; all corrective Work shall be at the Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS FOR FLASHING FABRICATION

- A. Plain Copper Sheet

Cold rolled copper, ASTM B370.

2.02 MANUFACTURED MATERIALS

- A. Copper/fabric flashing: consisting of a full sheet of copper, weight of copper core not less than 5 ounces per square foot, permanently bonded with rubber based adhesive to and between 2 layers of fiberglass or polymer fabric. Each layer of fabric shall be 0.3 oz. per sq. ft. minimum weight, with minimum 10x20 threads per inch. Flashing shall be compatible with air barrier system, sealants, adhesives, and other adjacent materials.

1. Manufacturers/Products

- a. York Manufacturing, Inc., Sanford, Maine:
Multi-Flash 500 Copper Fabric Flashing.
- b. Advanced Building Products Inc., Springvale
Maine: Copper Sealtite 2000.
- c. Hohmann & Barnard, Inc., Hauppauge, NY:
Copper NA.

2.03 FASTENERS

A. Nails

"Stronghold" type large flat head roofing nail.

- 1. For Copper: Hardened copper.

B. Screws, Bolts, and other Fastening Accessories

- 1. For Copper: Copper or brass.

C. Anchors

Provide one of the following types:

- 1. Hammer driven anchors, consisting of a stainless steel drive pin and a corrosion resistant metal expansion shield inserted thru a stainless steel disc with an EPDM sealing washer.
- 2. Self-tapping, corrosion resistant, concrete and masonry screw inserted thru a stainless steel disc with an EPDM sealing washer.

D. Fasteners for Through-Wall Flashing Termination Bar

- 1. Tapcon Concrete Screw: stainless steel.

2.04 MISCELLANEOUS MATERIALS

A. Solder

Composition of block tin/pig lead of proportion recommended by the metal manufacturer, stamped either 50/50 or 60/40 "Warranted".

B. Flux

Paste or acid type as recommended by the metal manufacturer.

C. Type 3 Sealant (For concealed sealant joints of thru-wall cap receivers and other areas which require concealed sealant).

One part butyl rubber sealant; Pecora BC-158, PTI 707, or Woodmont chem-Calk 300.

D. Termination Bar (For thru-wall copper/fabric flashing)

Plastic. Provide material compatible with the air barrier system. York Manufacturing Co., Sanford, Maine.

E. Flashing Sealants and Adhesives

Provide products recommended in writing by the flashing manufacturer, and compatible with all adjacent materials, including components of the air barrier system. Materials containing asbestos are prohibited. Asphalt mastics and other asphaltic materials shall not be used.

1. Where low modulus silicone sealant is indicated provide ASTM C 920, single-component, neutral-curing silicone; Class 100/50, Grade NS, Use NT, Use O.

2.05 FABRICATION

A. General: Where practicable, form and fabricate sheet metal Work in the factory or shop. Produce bends and profiles accurately to the indicated shapes. Where not indicated or specified, follow the applicable requirements of the reference standards listed in PART 1. All corners to be factory prefabricated. Hem exposed sheet metal to eliminate all sharp edges and corners.

B. Cap Flashing (one-piece): Fabricated to be spring-tight against wall/base flashing. All corners shall be factory prefabricated: mitered and lapped approximately 1" at

corner, and fully soldered or welded. At expansion joints, provide v-notch splice joint with 6" lap each side.

1. Copper: 16 oz.

C. Cap Flashing (two-piece) with In-Wall, Thru-Wall, or Coping Cap Receiver; All corners of coping flashing and of cap receivers shall be factory prefabricated: mitered and lapped approximately 1" at corner, and fully soldered or welded. At expansion joints, provide v-notch splice joint with 6" lap matching three-way fabrication each side of joint. Cap flashing fabricated to be spring tight against wall/base flashing.

1. Cap Flashing: three-way mortar bond type receiver with snap fit cap flashing.

Acceptable manufacturers / products:

- a. Keystone Flashing Co., 5119 N. Second Street, Philadelphia, PA. "Keystone Two-Piece cap Flashing".
- b. Cheney Flashing Co., 623 Prospect St., Trenton, NJ. "Cheney Prefabricated Snap Lock Cap Flashing".
- c. LITSCO, Long Island Tinsmith Supply Corp., 76-11 88th St., Glendale, NY. Two-piece snap fit cap flashing; with 3-way mortar bond receiver.
- d. B & B Sheet Metal, 25-40 50th Ave. Long Island City, NY. Two-piece snap fit cap flashing; with 3-way mortar bond receiver.
- e. WG Sheet Metal Corporation. 341 Amber Street Brooklyn, NY. Cap Flashing with 3-way mortar bond receiver.

2. Thru-wall Coping Flashing, with and without receiver: Three-way mortar bond flashing, with snap fit cap flashing for flashing with receiver. Allow for 1/2" extension of flashing beyond masonry face below stone prior to the bend for the drip to allow

for raking and sealing of mortar joint below flashing for faces without receiver.

Acceptable manufacturers / products:

- a. Keystone Flashing Co., 5119 North Second Street, Philadelphia, PA. "Keystone Thru-wall Flashing".
- b. Cheney Flashing Co., 623 Prospect St., Trenton, NJ. "Cheney 3-way Sawtooth Thru-Wall Flashing"
- c. LITSCO, Long Island Tinsmith Supply Corp., 76-11 88th St., Glendale, NY. Thru-wall coping flashing; with 3-way mortar bond.
- d. B & B Sheet Metal, 25-40 50th Ave. Long Island City, NY. Thru-wall coping flashing; with 3-way mortar bond.
- e. WG Sheet Metal Corporation. 341 Amber Street Brooklyn, NY. Thru-wall coping flashing; with 3-way mortar bond.

3. Materials

- a. Copper: 16 oz.

D. Cap Flashing with Concrete Reglet

1. Reglet with 45-degree slot, and snap fit cap flashing. Hooked edge of cap flashing shall lock into reglet. Acceptable products: "Cheney Type-A Snap Lock Concrete Reglet"; and "Keystone Concrete Reglet".

2. Materials

- a. Copper: 16 oz.

F. Formed Gravel Stops

1. Copper: 20 oz.

G. Extruded Aluminum Gravel Stop

Complete system including gravel stop, extruded aluminum joint cover plates, concealed 0.025" aluminum joint flashing, fasteners and all other accessory components. Type F gravel stop as manufactured by Architectural Products Company, Covington, KY., or equivalent by W.P. Hickman Co., Asheville, NC.

1. Face Height: Closest manufacturer's standard dimension to face height shown on Drawings.
2. Finish: Anodized; Color: As selected by the Project Architect.

I. Shop-Formed Coping

1. Copper: 20 oz.

J. Factory Fabricated Formed Coping

Complete system including 0.063" aluminum coping, anchor plates, joint drainage system, concealed joint covers and all other accessory components. "Permasnap Coping" as manufactured by W.P. Hickman Company, Asheville, NC; or "Snap-Lok Coping" as manufactured by MM Systems Corp, Tucker, GA.

1. Finish: Anodized; color: as selected by Architect.

K. Metal Expansion Joint Cover

1. Copper 20 oz.

L. Roof Drain Flashing

Sheet lead, 6 lbs per sq. ft.

N. Eave and Rake Flashing

1. Copper: 16 oz.
2. Lead Coated Copper: 16 oz.

P. Crickets

1. Copper: 16 oz.

Q. Thru-Wall Flashing

1. Manufactured copper/fiberglass fabric flashing.

R. Sealant Edge Flashing

1. Stainless Steel: 26 gauge, hemmed edge.

S. Gutters and Downspouts

1. Manufacturers:

- a. Metal-Era, Inc. (Basis of Design)
1600 Airport Road
Waukesha, WI 53188
262-549-6900
Fax: 262-549-6009
Internet address: www.metalera.com

- b. B&B Sheet Metal
25-40 50th Avenue
Long Island City, NY 11101
718-433-2501
Fax: 718-433-2709
Internet address: www.bbsheetmetal.com

- c. ATAS International, Inc.
6612 Snowdrift Road
Allentown, PA 18106
800-468-1441
Fax: 610-395-9342
Internet www.atas.com

2. Seal-Tite Gutter System: Designed to accommodate the drainage of large roof areas. Model shall be IG-2 (Basis of Design).

3. PERFORMANCE CHARACTERISTICS:

- a. Heavy gauge gutter straps securely support large volumes of water, as well as extreme snow and icing conditions.
- b. Manufactured to rigid tolerances and furnished per required drainage capacity/size.

- c. Adapts easily to "optional" drainage bars or flow through gravel stops.
- 4. Gutter metal gauge: .050" thick formed aluminum with Kynar 500 finish.
- 5. Gutter: standard 12'-0" (3.65 m) lengths.
- 6. Exterior gutter finishes: Kynar 500 from manufacturer's standard colors.
- 7. ACCESSORIES:
 - a. Corners, end caps, expansion joints or exterior brackets shall be fabricated by manufacturer. Factory fabricated, mitered corners shall have 17½" nominal leg lengths.
 - b. Provide matching ledge caps, downspouts, or other special fabrications as detailed.
- 8. INSPECTION:
 - a. Verify that the roof edging installation will not disrupt other trades. Verify that the substrate is dry, clean and free of foreign matter. Report and correct defects prior to any installation.
- 9. INSTALLATION OF GUTTER SYSTEM:
 - a. Submit product design drawings for review and approval to Architect or Specifier before fabrication.
 - b. Installing contractor shall check as-built conditions and verify the manufacturer's gravel stop details for accuracy to fit the wall assembly prior to fabrication. The installer shall comply with the roof edging manufacturer's installation guide when setting edging.
 - c. Installer shall furnish mechanical fasteners consistent with manufacturer's instructions;

suitable for the substrate to which being installed.

2.06 MISCELLANEOUS FABRICATED SHEET METAL ITEMS

A. Metal Linings

Metal-lined cabinets and clay trucks: 22 gage aluminum sheet-ASTM B209, 3003-H14 alloy, standard mill finish.

- ### **B. Loudspeaker Enclosure (Refer to Section 05700)**
- Provide sheet metal enclosure and sound-absorbing blanket as indicated on Drawing Details.

PART 3 - EXECUTION

3.01 EXAMINATION

- #### **A. Coordinate the work of this Section with other Work for the correct sequencing of items that make up the entire system of weatherproofing or waterproofing.**

3.02 PREPARATION

- #### **A. Do not install the Work of this Section unless all necessary nailers, blocking and other supporting components have been provided.**
- #### **B. Do not install the Work of this Section unless all substrates are clean and dry. Do not cover air barrier membrane until the completion of a curing period if recommended by the membrane manufacturer.**

3.03 INSTALLATION

A. Isolation

Separate dissimilar metals from each other with a dielectric coating to prevent galvanic action. Coating shall be synthetic material as required for compatibility with adjacent materials.

B. Tinning and Soldering

1. Use soldering irons (heavy coppers) as Industry Standard. Torch soldering is not acceptable.

2. Clean, flux and tin all surfaces to be soldered.
 3. Sweat solder thoroughly into seams, completely filling the seam for the full width.
 4. Upon completion of soldering, remove all traces of flux residue, and if required, apply a neutralizing wash followed by a clean water wash.
- C. Installing In-Wall and Thru-Wall Cap Flashing Receivers, In-Wall/Through-Wall Flashing and Thru-Wall Coping (with or without receiver) Flashing
1. Set the flashing so there is mortar above and below the built-in portion. Bonding ribs shall be completely filled with mortar.
 2. Do not mallet, bend or deform the exposed portion.
 3. Lap all end joints so they interlock at the first raised rib. Apply Type 3 sealant between the mating surfaces of the built-in portion of the flashing before interlocking end joints.
 4. All corners shall be factory prefabricated: mitered and lapped approximately 1" at corner, and fully soldered or welded by the manufacturer.
 5. Provide splice plate at all expansion joints, 12" wide, with 6" lap each side and v-notch in center of joint.
 6. Flashings that end at vertical surfaces, into windows, cavities shall be turned up 2" to form a pan.
- D. Installing Concrete Reglet
1. Furnish reglet for installation with formwork, complete with fasteners and filler.
- E. Installing Cap Flashing
1. General: Form and install the cap to provide a spring tight fit against the base flashing. Lap all

end joints a minimum of 6" and base flashing a minimum of 4". Extend the cap continuously around corners or provide lock seams. Install waterstop flashing at expansion joints.

2. Cap Flashing for Installation in Reglets:

- a. Extend the cap flashing into the reglet, applying pressure to securely lock it into position along its entire length.
- b. Pack the reglet with lead wool to within 1/4" of the reglet opening, then fill with sealant and tool to a slightly concave surface.

3. Surface Mounted Cap Flashing:

- a. Form the top portion of the cap flashing which comes in contact with the wall surface with a 1" wide bearing surface. Form a 45 degree x 1/4" wide stiffener and calking flange along the top edge.
- b. Apply Type 2 sealant on the backside of the bearing surface.
- c. Secure the cap flashing to the wall with fasteners spaced 12" oc thru the bearing surface.
- d. Apply Type 2 sealant along the calking flange.

4. In-Wall Cap Flashing (New Masonry Construction):

- a. Extend the built-in portion of the cap a minimum of 4" into the wall. Form the edge of the built-in portion with a 1/4" hook dam.
- b. Set the cap so there is mortar above and below the built-in portion.
- c. Lap all seams a minimum 6" and apply Type 3 sealant between the mating surfaces of the built-in portion of the flashing.

5. Provide a cap flashing at roof terminations at roof

curbs such as at mechanical equipment.

6. Cap flashing For Installation in Receivers: Insert the cap flashing into the receiver locking slot. Apply upward pressure along the entire length of the cap flashing so that it is securely locked into position. Nail 1" wide strap of same material as flashing at 32" o.c. prior to inserting cap in receiver. After cap installation, bend strap over edge of flashing by 1/2" to prevent flashing from coming out of receiver.
7. Pre-tin and solder with soldering irons (heavy coppers) all inside and outside corners. Install a separate reinforced mitered corner lapping the flashing 4" each side soldered at the receiver and sown the sides.
8. Where applicable, release existing soldered lap with soldering iron, install base flashing, dress down and re-solder existing lap.

F. Dressing Down Existing Cap Flashing

1. Turn up all cap flashings as required to perform the Work. Upon completion of the Work, dress down all disturbed cap flashings so they lie flat against the base flashing.
2. Secure the cap flashing to the wall surface with fasteners spaced 18" oc.
3. Install matching metal patches at corners of cap flashings which have been cut to perform the Work. Lap the patches a minimum of 1" on each side of the cap flashing.
 - a. Secure the patch by pop-riveting or by soldering.

G. Installing Base Flashings

1. Form the base flashing with locked and soldered joints into lengths not more than 24'-0" oc.

2. Provide expansion joints a maximum of 24'-0" oc on straight runs and a maximum of 4' from corners. Form expansion joints with a 3" loose locked seam filled with Type 3 Sealant.
 - a. Expansion Joint: slit the cross folded portion of the flashing where it is bent at a right angle. Solder a patch over the slit to avoid binding at the cross fold.
3. Extend the vertical portion of the base flashing a minimum of 3" up behind the cap flashing.
 - a. Where shown on the Drawings, lock the base flashing to the cap flashing with a minimum 3/4" loose lock joint.
4. Extend the horizontal portion of the base flashing a minimum of 4" and terminate in a 1/2" folded edge. Secure with nails spaced 3" oc staggered.

I. Installing Formed Metal Gravel Stops

1. Form the gravel stop into lengths not exceeding 8'-0". Allow 1/4" between sections for expansion.
2. Install a continuous edge strip secured 8" oc.
3. Install a 12" wide concealed splice plate at all joints. Form the splice plate to the exact shape of the gravel stop. Center the splice plate beneath the joints of the gravel stop and secure to the roof deck.
4. For single ply membranes: Apply the membrane manufacturer's recommended sealant between the contact surface of the horizontal portion of the splice plate and the gravel stop.
5. Extend the horizontal portion of the gravel stop onto the roof surface a minimum of 4" and terminate in a 1/2" folded edge. Secure with nails spaced 3" oc staggered. Hook the drip edge of the gravel stop over a continuous metal edge strip.

6. Where gravel stop face height exceeds 8", provide a longitudinal break at the center line unless shown otherwise on the Drawings.
7. Provide a 6" long exposed matching cover at all joints, fabricated to conform to the shape of the gravel stop.

J. Installing Thru Wall Scupper

1. Form the scupper with 4" wide flashing flanges.
2. Where protected membrane roofing is provided, scuppers shall be equipped with grilles with opening size not greater than the size of stone ballast used on the roof.
3. Lock and solder, or rivet and solder all construction joints of the scupper.

K. Installing Extruded Aluminum Gravel Stop

1. Install 12" wide, 0.025" concealed aluminum flashing beneath the gravel stop at all joints.
2. For single ply Membranes: Apply the membrane manufacturer's recommended sealant between the contact surfaces of the horizontal portion of the splice plate and the gravel stop.
3. Secure the gravel stop at the mid point, and at ends of each 10'-0" section. Allow a 1/2" space between each section for expansion.
4. Provide a 6" long, exposed matching aluminum cover at all joints, fabricated to conform to the shape of the gravel stop.

L. Installing Formed Metal Coping

1. Form the coping into lengths not exceeding 8'-0".
2. Join coping sections with 1-1/2" loose locked seams filled with Type 3 sealant.

3. Hook the front and back edges of the coping over continuous metal edge strips. Nail the edge strip 6" oc.

M. Installing Factory Fabricated Formed Metal Coping

Install in accordance with the manufacturer's written instructions unless shown or specified otherwise.

N. Installing Expansion Joint Cover

1. Install combination edge strip and cap flashing over the base flashing. Secure the edge strip along the top of the curb and lap the base flashing a minimum of 4". Lap each individual length a minimum of 6".
2. Form the expansion joint cover with standing seam joints not to exceed 10'-0" oc.
3. Turn the edges of the cover over the edge strip. Allow clearance of one half the width of the expansion joint between all edges of cover and edge strip.

O. Reflashing Existing Drains

Remove the existing dome strainer, clamping ring and lead flashing from existing roof drains. Install 34" square lead flashing turned into drain body and reinstall clamping ring and strainer. If necessary, tap existing clamping ring bolt holes and install new clamping ring bolts.

P. Installing manufactured copper/fiberglass fabric flashing.

1. Installation

- a. All surfaces to receive the copper/fiberglass flashing shall be reasonably smooth, free from irregularities.
- b. On horizontal masonry surfaces, lay flashing in a coat of manufacturer recommended sealant, and with a fresh bed of mortar above the

- flashing. Spot vertical surfaces with sealant or other recommended material to hold flashing in place until masonry is set, and secure as detailed. Trim flashing to terminate flush with the exposed face of masonry wall, except at masonry indicated to have deeply raked joints, and as otherwise indicated.
- c. For installation in conjunction with "sealant edge" indicated below, lay flashing in a coat of manufacturer recommended sealant on top of sealant edge, with the fabric flashing cut back from the finished face.
 - d. Install the flashing in continuous lengths with the minimum number of joints. Door and window flashing shall be installed in one continuous length from side to side. All seams are to have silicone sealant for entire length.
 - e. At corners, beams, columns, and at other junctures, fit flashing to the proper contour.
 - f. Fold flashing at ends to form dams at all edges.
2. Over Concrete Foundations: Lay flashing in a fresh bed of mortar above and below. When recommended by the flashing manufacturer the flashing may be laid on a coat of recommended sealant, and with a fresh bed of mortar above the flashing. At the intersection with column, bring flashing a minimum of 10" up the column and affix with mastic or other recommended material.
3. Spandrels: Start flashing cut flush with the outside face of the wall; go over the stainless steel sealant edge as shown on Drawings, adhered to sealant edge flashing with a full coat of low modulus silicone sealant. Go up inside the wall cavity as indicated on the Drawings. Then go thru the wall turning up on the inside face of the wall not less than 2", or provide a continuous termination bar as indicated on the Drawings to

seal flashing to backup masonry or concrete after air barrier membrane is applied. Fasten bar to substrate 8" on center, with stainless steel fasteners anchored into pre-drilled pilot holes. Provide a continuous bead of low modulus silicone sealant along top of termination bar to completely seal the bar and flashing to the substrate. Confirm that all materials are compatible with the air barrier system.

4. Heads: Start flashing covering the toe of lintel angle or as shown on the Drawings; go over the lintel on a full coat of low modulus silicone sealant. Go up inside the wall cavity as indicated on the Drawings. Then go thru the wall turning up at the inside not less than 2", or where indicated on the Drawings provide a continuous termination bar as specified for Spandrel flashing. Extend flashing at least 6" on each side of the opening. Turn flashing at the ends, forming a 2" deep pan running entirely thru the wall. All corners shall be folded, not cut.
5. Thruwall: Start flashing cut flush with the outside face of wall. Lay flashing on masonry in a fresh bed of mortar above and below. Extend flashing up thru the wall turning up at the inside not less than 2", or provide continuous termination bar as indicated on the Drawings to seal flashing to backup masonry or concrete after air barrier membrane is applied. Fasten bar to substrate 8" on center, with stainless steel fasteners anchored into pre-drilled pilot holes. Provide a continuous bead of low modulus silicone sealant along top of termination bar to completely seal the bar and flashing to the substrate. Confirm that all materials are compatible with the air barrier system. Where flashings end at vertical surfaces, into windows, cavities, etc., turn flashing up 2" high, fully soldered, to form a pan.
6. Joints: Lap joints at least 6", coating the contacting surfaces with sealant recommended by flashing manufacturer.

Q. Sealant Edge

Provide stainless steel sealant edge flashing on relieving angles as indicated on the Drawings and wherever else indicated. Form flashing as required to suit lipped brick or other configuration. Adhere to relieving angle with a full coat of low modulus silicone sealant. Seal joints with sealant. Provide factory prefabricated corners and lap pieces a minimum of 4", with a full coat of low modulus silicone. Edge shall be hemmed.

R. Gutters and Downspouts

1. Connection to Existing Construction where applicable: Tie the items of Work in with the existing work to obtain watertight installation. Match the existing installation as much as practicable, unless otherwise specified. Repair and dress adjacent existing components as required to make secure and neat connections with new items.
2. Installation of Hung Gutters:
 - a. Install gutter hanger brackets 3'-0" oc. Install the brackets so there will be a slight pitch in the gutter towards the downspouts.
 - b. Join the gutter sections with 1" wide lapped, riveted, and soldered seams. Use 3/16" diameter rivets spaced 2" o.c.
 - c. Install expansion joints where indicated on the Drawings. If not indicated, place the expansion joints at mid points between the downspouts at maximum intervals of 48 feet.
 - 1) Form the expansion joints with end baffles conforming to the shape of the gutter. Rivet and solder the baffles to the gutter section.
 - 2) Install a cover plate over the baffle.
 - d. Install gutter end pieces, mitered corners and outlet tubes. Solder joints and connections.

- e. Install a continuous stiffener bar along the top front edge of the gutter. Fold the gutter around the stiffener bar so it is securely locked in place.
 - f. Install gutter braces 3'-0" oc, staggered from the gutter hanger brackets. Secure the braces to the stiffener bar and to the back vertical portion of the gutter with brass or copper bolts.
 - g. Secure the top back edge of the gutter to the gravel stop, eave flashing, or continuous cleat as indicated on the Drawings.
3. Installation of Downspouts:
- a. Join the downspout sections with end joints that telescope at least 1¹/₂"
 - b. Install necessary offsets and elbows.
 - c. Install a minimum of 2 hangers at each downspout section. Form hangers to keep downspouts 1" away from wall.
 - d. Fasten downspouts to hangers with sheet metal screws.
 - e. Secure hangers to masonry and concrete walls with machine bolts in lead shields and to wood walls with screws.
 - f. Discharge Elbows: Fasten leader shoes to downspouts with a minimum of 3 sheet metal screws.
 - g. Connection to Underground Drains: Fit the downspout neatly into the drain pipe or boot. Caulk the joint with lead wool and seal with sealant.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Shop Drawings:	_____	_____
1. Flashing, trim, and other specified sheet metal items		
2. Layout and details of snow guards.		
Product Data:	_____	_____
1. Catalog sheets		
2. Specifications		
3. Installation instructions		
4. Manufacturers recommendations for spacing and installation of snow guards.		
Samples:	_____	_____
1. Flashing		
2. Anchors		
3. Gravel Stop		
4. Coping		
5. Gutters		
6. Downspout		
7. Snow guards		
8. Termination bar, fasteners & sealant		
Project Closeout:	_____	_____
1. Guarantee		
Quality Assurance:	_____	_____
1. Training Certificate		
Product Certificates:	_____	_____
1. Compatibility		

* * *

SECTION 07 61 00
SHEET METAL ROOFING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide factory formed metal roof panels: standing-seam, hidden fastener, non-insulated roofing. Work as indicated on the Drawings and as specified herein.
- B. See Section 07 60 00- Flashing and Sheet Metal, for gutters, downspouts, flashing and other sheet metal items.

1.02 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. ASTM International (ASTM)
 - ASTM E283
 - ASTM E331
 - ASTM E330
 - ASTM E1592
 - ASTM E84
- C. SMACNA Standards
 - Comply with applicable requirements of the "SMACNA Architectural Sheet Metal Manual", latest edition published by the Sheet Metal and Air Conditioning Contractor's National Association.
- D. Underwriters Laboratory
 - UL 580
 - UL 2218

1.03 SUBMITTALS

A. Shop Drawings: Submit complete shop drawings including roof plan, large scale details of all flashing conditions, leaders, gutters and drains. Show manner of forming, jointing and securing of the Work. Indicate all dimensions and materials.

B. Product Data

Submit specifications and installation instructions for each material to be used in the Work, including certifications and other data as may be required to show compliance with the Contract Documents.

C. Samples

1. Sheet metal, each type: 24" square mounted on plywood backing, indicating actual metal seaming details, flashing, finish and color range of material to be used in the Work.

2. Fasteners: 6, each type.

3. Sealant: One cartridge.

D. Statement of Application

Submit statement of Application, signed by the Contractor and roofing installer, stating that the roofing work complies with these specifications, and that the installation methods comply with the manufacturer's printed specifications and instructions for the conditions of installation and use on this project.

E. Submit installer certifications per Article titled Quality Assurance.

1.04 PERFORMANCE CRITERIA

- A. Design, fabricate and install metal roofing so that the total, installed system will withstand inward and outward pressure of 90 psf with the capacity determined using the pleated airbag method in accordance with ASTM E1592.
- B. Design fabricate and install component parts to provide for expansion and contraction of the metal roofing over an ambient temperature range of 120°F and a surface temperature range of 180°F.

1.05 QUALITY ASSURANCE**A. Installer**

Minimum five (5) years successful experience in sheet metal roofing Work of type specified.

B. Project Foreman Qualifications

- 1. Successful completion of a formal instructional and training program for the installation of the specified roofing/flashing systems, as evidenced by:
 - a. A certificate of journeyman roofer as issued under a union apprenticeship-journeyman training program duly registered with the New York State Department of Labor (or other State Labor Department); or
 - b. A certificate or diploma issued by a vocational training school or national roofing manufacturer attesting to successful completion of an equivalent formal training program. (Submit copy of certificate for above).

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle all materials of the Work of this Section as recommended by the materials Manufacturer, to protect from danger.

1.07 WARRANTY

A. Contractor shall provide a 10-year written warranty, covering the metal roofing materials and workmanship. The warranty shall include but not be limited to, repair of leakage caused by defects in materials or workmanship. Should defects occur during the stated period, they shall be corrected immediately, and all damage caused by such defects shall be corrected. All corrective work expense shall be borne by Contractor.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Concealed-fastener, standing seam metal roof panels.
1. General: Provide factory-formed metal roof panels designed to be field assembled by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation. Unless more stringent requirements are indicated, comply with ASTM E 1514.
 2. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and mechanically seaming panels together with approved seaming equipment.
 - a. Manufacturer:
 - i. Basis-of-Design Product: Tremco, Inc. Roofing Division; 3735 Green Rd. Beachwood, OH 44122; 800-562-2728; www.tremcoroofing.com
 - ii. ATAS International, Inc.; 6612 Snowdrift Rd. Allentown, PA 18106; 800-468-1441; www.atas.com

iii. Centria; 1550 Coraopolis Heights
Rd.Suite 500 Moon Township, PA 15108;
800-759-7474; www.centria.com

b. Material: Aluminum .032
Texture: Smooth
Pan Coverage: 16-1/2"
Seam Height: 1-1/2"
KYNAR 5000® PDVF or HYLAR 5000® Finish
Standard color to be chosen later by AOR

B. Underlayment

1. Asphalt free felt: Conforming to ASTM D 226,
polyolefin based, 100 percent asphalt free, high
strength reinforced roofing underlayment.

C. Miscellaneous Material

1. Fasteners: Self-tapping screws, self-locking
rivets and bolts, and other suitable fasteners
designed to withstand design loads. Manufacturer
shall provide or authorize all fasteners utilized
with the sheet metal roofing system.

a. Exposed Fasteners: Heads matching color of
sheet metal roofing by means of plastic caps
or factory-applied coating.

b. Fasteners for Flashing and Trim: Blind
fasteners or screws spaced to resist wind
uplift loads.

2. Sealing Tape: Pressure-sensitive, 100 percent
solid polyisobutylene compound sealing tape with
release-paper backing. Provide permanently
elastic, non-sag, non-toxic, non-staining tape.

3. Elastomeric Joint Sealant: ASTM C 920, of base
polymer, type, grade, class, and use
classifications required to produce joints in
sheet metal roofing that will remain
weathertight.

4. Expansion-Joint Sealant: For hooked-type expansion joints, which must be free to move, provide non-setting, non-hardening, non-migrating, heavy-bodied polyisobutylene sealant.
5. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15 mil dry film thickness per coat.

D. Accessories

1. Sheet Metal Roofing Accessories: Provide components required for a complete sheet metal roofing assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of sheet metal roofing, unless otherwise indicated. All trim and flashing components shall be supplied in a minimum of 12'-0" lengths and shall conform to manufacturer's standard part dimensions and details.
 - a. 26 ga. SS clip base w/26 ga. SS stem designed to withstand negative-load requirements.
 - b. Closures: Closed-cell, expanded, cellular, rubber or cross linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match sheet metal roofing profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 - c. Sealants as recommended by manufacturer.
 - d. Fasteners as recommended by manufacturer.

- E. Flashing and Trim: Formed from matching materials as sheet metal roof panel in gauges noted. Provide flashing and trim in heavier gauge materials as required to seal against weather and to provide finished appearance. Locations include, but are not

limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent sheet metal roofing.

- F. Dissimilar Materials: Coat the mating surfaces of dissimilar materials with asphaltic paint, roofing cement, or other material recommended by roofing manufacturer to prevent galvanic corrosion.

2.02 FABRICATION

- A. General: Fabricate sheet metal roofing and components to comply with details shown, manufacturers installation details and recommendations in SMACNA's "Architectural Sheet Metal Manual" and NRCA Waterproofing Manual that apply to the design, dimensions (pan width and seam height), geometry, metal thickness, and other characteristics of installation indicated. Fabricate sheet metal roofing and accessories at the manufacturer's location to the greatest extent possible.
- B. General: Fabricate sheet metal roofing panels to comply with details shown and sheet metal roofing manufacturer's written instructions.
- C. Fabricate sheet metal roofing to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks, true to line and levels indicated, and with exposed edges folded back to form hems.
1. Fold and cleat eaves as required by manufacturer to insure weathertightness and wind uplift resistance.
 2. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements shown and as required for leak proof construction and wind uplift resistance.

- D. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturers of dissimilar metals or by fabricator.
- E. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before manufacturer fabrication..
- F. Distance between Seams

As indicated on the Drawings.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Lay out and examine substrate before installation of sheet metal roofing. Space fasteners as required to resist design uplift, but not more than 24 inches o.c.
- B. Install flashings and other sheet metal to comply with requirements specified in Section 07 60 00 "Flashing and Sheet Metal."

3.02 INSTALLATION

- A. General: Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by fabricator for sheet metal roofing.
 - 1. Field cutting of sheet metal roofing by torch is not permitted.
 - 2. Rigidly fasten ridge end of sheet metal roofing and allow for positive panel attachment as per

manufacturer's recommendations. All flashing details shall accommodate thermal movement.

3. Provide metal closures at peaks, ridge, gable and hip caps.
 4. Flash and seal sheet metal roofing with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 5. Locate roofing splices over, but not attached to, structural supports. Stagger roofing splices and end laps to avoid a four-panel lap splice condition.
 6. Lap metal flashing over sheet metal roofing to allow moisture to run over and off the material.
- B. Fasteners: Use fasteners of size and length as required for compatibility with substrate.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by fabricator of sheet metal roofing or manufacturers of dissimilar metals.
1. Separate sheet metal roofing from bituminous coating where roofing will contact wood, ferrous metal, or cementitious construction. Interlock and overlap shingles and stagger end joints from shingles above and below according to shingle manufacturer's written instructions.
- D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

END OF SECTION

* * *

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide all roof accessories as indicated on the Drawings and as specified herein, including, but not limited to, the following:

1. Roof Hatches
2. Roof Vents

1.02 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

B. Underwriters Laboratories, Inc. (UL).

C. Occupational Safety and Health Administration (OSHA).

1.03 SUBMITTALS

A. Shop Drawings

Show relationship with adjoining Work and anchorage methods. Include plans, sections, and details.

B. Product Data

Manufacturer's catalog sheets, specifications, and installation instructions for roof hatches and vents.

1. Emergency Electric Release Devices: Electrical rating (volts, amps).

C. Contract Closeout Submittals

Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Authority.

D. Warranties

1.04 QUALITY ASSURANCE

A. Manufacturer

Minimum of five years experience in the manufacture of products of type specified.

B. Installer

Minimum of three years experience in the installation of products of type specified.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle the products of this Section as recommended by the Manufacturer, to protect from damage.

1.06 SEQUENCING AND SCHEDULING

A. Coordinate installation of roof accessories with roofing and flashing.

1.07 MAINTENANCE

A. Spare Parts

Furnish three spare 160°F fusible links for each roof vent with such device.

1.08 WARRANTIES

A. All roof hatches and vents shall be furnished with the manufacturer's standard 5 year warranty.

PART 2 -PRODUCTS

2.01 MANUFACTURERS

A. Babcock-Davis Hatchways, Inc., Arlington, MA

B. Bilco Co., New Haven, CT

2.02 ROOF HATCHES

A. Type

Aluminum units consisting of an insulated and weather stripped hinged cover on an insulated curb fitted with integral cap flashing and safety railing.

1. Cover: 11 gage, mill finish aluminum with 3" beaded or hemmed flange, 1" thick fiberglass

insulation covered by a 18 gage aluminum liner, and neoprene or closed cell rubber gasket seal around perimeter. Cover shall open to 90 degrees.

2. Curb: 11 gage minimum, mill finish aluminum with $3\frac{1}{2}$ " flange at bottom with holes for securing to roof deck, 11 gage aluminum cap flashing at top, and 1" thick rigid fiberboard insulation on exterior of curb.
 - a. Curb height shall be as required to provide a dimension of at least 8" from top of roof surfacing (gravel, pavers, etc.) to bottom of integral cap flashing.
3. Fabrication: Continuously weld metal joints.
4. Hardware: Zinc or cadmium plated steel; heavy pintel hinges, enclosed spring operators, positive snap latch with turn handles inside and outside, padlock hasp inside, and automatic hold-open operating arm with one hand grip release handle.
5. Safety railing: Conform to OSHA Standard CFR 29 1910.23 Fall Protection in General Industry, and local regulations. Hatch manufacturer's railing system, with chain or gate on access side. Rail system shall be supported from hatch assembly without penetrating roofing. Provide weatherproof label: "NO HOISTING". Provide corrosion resistant materials throughout.

2.03 ROOF VENTS

A. Type

Automatically operated smoke and heat roof vents bearing Underwriters Laboratories Inc. listing mark. Aluminum units consisting of an insulated and weatherstripped hinged cover opening approximately 90 degrees, on an insulated curb fitted with integral cap flashing and safety railing.

1. Cover: 11 gage mill finish aluminum with 3" beaded or hemmed flange, 1" thick fiberglass insulation covered by a 18 gage aluminum liner, and neoprene or closed cell rubber gasket seal around perimeter. Cover slope $1/2$ " in 12" minimum.

2. Curb: 11 gage minimum, mill finish aluminum with 3½" flange at bottom with holes for securing to roof deck, 11 gage aluminum cap flashing at top, fixed center gutter, and 1" thick rigid fiberboard insulation on exterior of curb.
 - a. Curb height shall be as required to provide a dimension of at least 8" from top of roof surfacing to bottom of integral cap flashing.
3. Fabrication: Continuously weld metal joints.
4. Hardware: Zinc or cadmium plated steel; heavy pintel hinges, spring operators which will open cover against 10 psf live load, heavy duty shock absorbers, pull rings and cable releases for inside and outside manual operation, and automatic hold-open arms.
5. Automatic Opening Devices:
 - a. Fusible Link Device: 160°F heat fusible link activated device. Manual operation shall not disturb fusible link device.
6. Safety railing: Conform to OSHA Standard CFR 29 1910.23 Fall Protection in General Industry, and local regulations. Roof vent manufacturer's railing system, with chain or gate on access side. Rail system shall be supported from roof vent assembly without penetrating roofing. Provide weatherproof label: "NO HOISTING". Provide corrosion resistant materials throughout.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install roof accessories in accordance with the manufacturer's instructions, unless shown otherwise on the Drawings. Securely anchor units in place to the substrate by bolting, screwing or welding.
- B. Where mounting flanges are set directly in the roofing, embed the flanges in roofing cement or other waterproof mastic or adhesive as recommended by the manufacturer of the roofing. On sloping surfaces, integrate mounting flanges with roofing elements to properly shed water.

3.02 FIELD QUALITY CONTROL

A. Tests

1. Roof Vents

- a. Vents with Fusible Link: Test each roof vent for proper operation after installation by fusing the link. Provide a replacement fusible link after approved test.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Shop Drawings:	_____	_____
1. Plans, sections, details		
2. Relationship with adjoining Work		
3. Anchorage methods		
Product Data:	_____	_____
1. Manufacturer's catalog sheets		
2. Specifications		
3. Installation instructions		
4. Electrical rating (volts, amps) for electric release devices		
Contract Closeout:	_____	_____
1. Operation and maintenance data		
2. Operation test reports		
3. Spare fusible links (for fusible link device)		
Warranty	_____	_____

* * *

SECTION 07 90 00
JOINT SEALERS**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

A. Provide all joint sealer Work as indicated on the Drawings, as required for the completed Work, and as specified herein. This Section includes joint sealants for the following applications:

1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints in exterior insulation and finish systems.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - f. Other joints as indicated.

B. The work of this section shall not take place until all PCB containing caulk has been removed in accordance with Section 02 82 13.

1.02 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work

1. American Society for Testing and Materials (ASTM)

1.03 SUBMITTALS

A. Product Data

Catalog sheets, specifications, and installation instructions for each type of joint sealant product specified except miscellaneous materials.

B. Samples for Initial Selection:

1. For general purpose use around windows and at relieving angles, Colors of Exposed Joint Sealants: Match Architect's samples.
2. For all other uses: provide Manufacturer's color charts consisting of strips of cured sealants showing the full range of Manufacturer's standard colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2" wide joints formed between two 6" long strips of material matching the appearance of exposed surfaces adjacent to joint sealants

D. Quality Control Submittals

1. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
2. Installer's Qualifications Data: Affidavit required under Quality Assurance Article.
3. Company Field Advisor Data: Name, business address, and telephone number of Company Field Advisor.
4. Preconstruction Test Results
 - a. Sealant manufacturer's test reports certifying compatibility and adhesion with all contiguous materials.

b. Sealant manufacturer's test reports certifying that the sealant will not stain contiguous materials.

c. The results of field adhesion testing.

E. Mockups

In accordance with Article titled Quality Assurance.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications

The persons installing the sealants and their supervisor shall be personally experienced in the installation of sealants and shall have been regularly employed by a company engaged in the installation of sealants for a minimum of two years.

1. Furnish a letter from the sealant manufacturer, stating that the Installer is authorized to install the manufacturer's sealant materials.

B. Container Labels

Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

C. Preconstruction field-adhesion testing

Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints as directed by Architect.
2. Conduct field adhesion tests for each kind of sealant and joint substrate.
3. Test using ASTM C1193 Method A: For joints with dissimilar substrates, verify adhesion to each substrate separately

4. Do not use sealants that fail to adhere to joint substrates during testing.

D. Mockups

Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joint sealer materials as recommended by the Manufacturer, to protect from damage.

1.06 PROJECT CONDITIONS

A. Environmental Requirements

1. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants at temperatures below 40°F or above 85°F.
2. Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing, and performance of the materials.
3. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.
4. Do not proceed with installation of joint sealants under the following conditions
 - a. When joint substrates are wet.
 - b. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
 - c. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

- d. Surfaces are frozen.
- e. Surfaces are superheated by the sun.

B. Protection

- 1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
- 2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved covering to prevent defacement from droppings.
- 3. Protect any painted surfaces which are not included in the Work from impact or damage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Momentive Performance Materials-GE Silicones, Waterford, NY 12188
- B. Dow Corning Corp., Midland, Michigan 48686
- C. Pecora Corp., Harleyville, PA
- D. Tremco Sealants and waterproofing, Beachwood, OH 44122
- E. Bostik, Middleton, MA 01949
- F. Sika Corporation, Lyndhurst, NJ 07071
- G. Schul International, Pelham, NH 03076
- H. Emseal Joint Systems Ltd., Westborough, MA 01581

2.02 SEALANTS

- A. Type 1 Sealant (for use in vertical expansion joints where movement occurs; for general purpose use around windows, door frames, louvers, and other junctures).

1. One-part low-medium modulus silicone sealant (plus or minus 50% movement); ASTM C920 classifications type S, grade NS, class 25, uses NT, M, G, and A: General Electric Silpruf SCS2000, Dow Corning 791, Pecora 864NST, Tremco Spectrem 2 or Sika SikaSil WS 295.

Silicones shall meet the following requirements:

- ASTM C719 - Low-Medium Modulus (+ or - 50%). Sealants shall not exhibit any cracking or surface degradation after 5000 hours exposure in the Atlas Twin Arc Weatherometer.
- ASTM C661 - Shall not incur a durometer increase greater than 10 points.
- Sealants shall contain zero parts of toxic isocyanurate ingredients.

Provide custom colors for use around window perimeters, to match window frame or masonry, or other colors as determined by the Architect.

- D. Type 1C Sealant - For general use around windows, store front systems, door frames, metal panel systems, metal coping, louvers, cast stone copings and other junctures where movement occurs.

One-part ultra-low modulus neutral cure silicone sealant; ASTM C920 classifications type S, grade NS, class 25, uses NT, M, G, A and O: Pecora 890 FTS; Tremco Spectrem-1 or Dow Corning 790 or Sika SikaSil WS 290.

Provide custom colors for use around window perimeters, to match window frame or masonry, or other colors as determined by the Architect.

- J. Pre-formed Sealant for exterior applications

1. Low modulus silicone sealants: Pecora Sil-Span, Sealex ImmerSeal, GE Ultraspan US1100.

2. Acrylic impregnated flexible polyurethane foam, such as Sealite Standard by Schul International Co., Tremco Illmod 600 or Compriband.

2.03 JOINT FILLERS

- A. Elastomeric Tubing Sealant Backings: (for precast panel joints not compatible with Silicone Sealants): Neoprene, butyl or EPDM tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26°F (minus 32°C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

ASTM D1056, Class SC (oil resistant and medium swell), 2 to 5 psi compression deflection.

- B. Expanded Polyethylene Joint Filler (for existing joints) Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).
- C. Closed-Cell Polyurethane or Closed-Cell Expanded polyethylene Joint Filler (for all cast-in-place concrete work).

Resilient, compressible, semi-rigid; W.R. Meadow Ceramar or equal.

- D. ASTM D1056, Class RE41 (for masonry joints) where shown on the Drawings.

2.04 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

1. For primers used on site and within the weatherproofing/waterproof membrane (interior) of the building comply with V.O.C. requirements specified in Section G01600.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 1. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), Type O (open-cell material) or Type B (bicellular material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- E. Bond Breaker Tape

Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self-adhesive where applicable.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.02 PREPARATION

- A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.
 - 1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
 - 2. Remove lacquers, protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
 - 3. Thoroughly clean surfaces on which sealant is to be applied using methods such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.
 - 4. Prime surfaces, if required, as recommended by Manufacturer before applying sealant.

3.03 JOINT BACKING INSTALLATION

- A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.
- B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.04 SEALANT INSTALLATION

- A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.
- B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impracticable, install sealant by knife or by pouring, as applicable.

C. Finishing

Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.

1. Use tool wetting agents as recommended by the sealant manufacturer.

3.05 FIELD QUALITY CONTROL

A. Field Adhesion Testing of Sealants - Test completed elastomeric joints as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and join substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
2. Test Method - Test joints by hand pull method described below:
 - a. Make knife cuts from one side of the joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2 inch piece.
 - b. Use fingers to grasp 2 inch piece of sealant between cross-cut end and 1" mark, pull firmly at a 90 degree angle or more in direction of side cuts while holding a ruler along sides of sealant. Pull sealant out of joint to the distance recommended by the sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension, hold this position for 10 seconds.

- c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side.
- 3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
- 4. Inspect tested joints and report on the following:
 - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
- 5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
- 6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- 7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during

testing or to comply with other requirements.
Retest failed applications until test results prove
sealants comply with indicated requirements.

3.06 CLEANING

- A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.
- B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product data:	_____	_____
1. Catalog sheets, specifications, installation instructions for each item specified		
Samples:	_____	_____
1. Manufacturer's color charts for Initial Selection		
2. Samples for Verification for each type and color of joint sealant		
3. Color samples for paint for type of sealant/application		
Quality Assurance	_____	_____
1. Manufacturer's Product Certificates		
2. Installer's Qualifications Data		
3. Company Field Advisor Data		
4. Manufacturer's test reports certifying compatibility		
5. Manufacturer's test reports certifying that sealant will not stain		
6. Pre-construction field adhesion test reports		
Mockups:	_____	_____

* * *

SECTION 08 11 13
HOLLOW METAL DOORS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, general provisions of the Contract and Sections of Division 1 apply to the Work of this Section.

1.02 SUMMARY

- A. This Section includes the following products manufactured in accordance with SDI Recommended Standards:
1. Doors: Seamless, composite insulated construction standard steel doors for exterior locations - Galvanized
 2. Frames: Existing frames to remain.
 3. Provide factory primed doors for field finish painting.
- B. Painting primed doors is specified on drawings.
- C. Door hardware is specified in Section 08 71 00 "Door Hardware".
- D. Glass and Glazing are specified in Section 088000 "Glazing".
- E. Contractor shall carefully remove all existing door hardware, shall place all removed hardware in a box labeled per door type, and all items shall be turned over to College Lock Shop department for future maintenance use, unless otherwise approved before removals occur.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of door specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles and finishes.
- C. Shop Drawings showing fabrication and installation of standard steel doors. Include detail of each elevation of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements and details of joints and connections. Show anchorage and accessory items.
1. Provide schedule of doors using same reference numbers for

details and openings as those on contract Drawings.

1.04 QUALITY ASSURANCE

- A. Provide doors complying with "Steel Door Institute RECOMMENDED Specifications Standard Steel Doors and Frames" ANSVSDI-1 00 and as herein specified.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors cardboard-wrapped or crated to provide protection during transit and job storage.
- B. Inspect doors upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. New doors shall be stored at Contractor's expense until installation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide standard steel doors by one of the following, or equal:
 - 1. Standard Steel Doors:
 - a. Ceco Corporation, Model Legion Extra Heavy-duty door and Model Mercury Thermal Break Frame are the design basis.
 - b. Curries Company.
 - c. Regent.
 - d. Amweld.

2.02 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with

ASTM A 525, with A60 or G60 coating designation, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 16 gauge sheet steel; galvanized where used with galvanized frames.

E. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

F. Shop Applied Paint: Apply after fabrication.

Primer: treat with three stage iron phosphate; provide baked-on shop coat of EPA-compliant gray synthetic resin, rust-inhibitive alkyd enamel primer, tested at a recognized independent testing laboratory in accordance with, and meeting acceptance criteria of, ANSI A250.10.

2.03 DOORS

A. Provide metal doors of SDI grades and models specified below or as indicated on Drawings or schedules:

1. Exterior Doors: ANSVSDI-100, Grade Ill, extra heavy-duty, minimum 16 gauge seamless galvanized steel faces and stitch welded end closures; Hot-dip galvanized material with 0.4 ounces per square foot (305 g/square m) coating conforming to ASTM A 924 and A 653.
2. Polystyrene insulated core.
3. End Welded
4. UL Fire Rated Label "B". Where required confirm with existing door assembly.
5. 14 Gauge Closer reinforcement at all locations required for door hardware components.
6. Primer: treat with three stage iron phosphate; provide baked-on shop coat of EPA-compliant gray synthetic resin, rust-inhibitive alkyd enamel primer, tested at a recognized independent testing laboratory in accordance with, and meeting acceptance criteria of, ANSI A250.10.

2.05 FABRICATION

A. Fabricate steel door units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to

assure proper assembly at project site. Comply with ANSVSDI-100 requirements.

1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.
 2. Clearances: Not more than 1/8 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.
- B. Fabricate exposed faces of doors and panels, from only cold-rolled steel.
- C. Tolerances: Comply with SDI 117 Manufacturing Tolerances Standard Steel Doors.
- D. Fabricate exterior doors from galvanized sheet steel in accordance with SDI-1 12. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16 gauge inverted steel channels.
- E. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- F. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal insulating door assemblies and tested in accordance with ASTM C 236 or ASTM C 976 on fully operable door assemblies.
1. Unless otherwise indicated, provide thermal-rated assemblies with U factor of 0.37 BTU (hr. X sq. ft. X degree Fahrenheit) or better.
- G. Hardware Preparation: Prepare doors and existing frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A1 15 Series Specifications for door and frame preparation for hardware.
- I. Reinforce doors to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.
- J. Locate hardware as indicated on final shop Drawings or, if not indicated, in accordance with Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames, published by Door and Hardware Institute, and in conformance with the current

standards of ANSI A117.1 and ADA requirements.

- K. Shop Painting: Clean, treat and paint exposed surfaces of steel door and existing frame, including galvanized surfaces.
1. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
 2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install standard steel doors, frames and accessories in accordance with final shop Drawings, manufacturer's data and as herein specified.
- B. Contractor shall not leave any door unsecured overnight, and any newly installed doors must be installed complete with lockset, glazing panels(s), thresholds, and all fasteners in quantities recommended by the specific door manufacturer, no exceptions.
- C. Contractor shall coordinate with the College at least two days in advance the transfer date for the lockset core(s) to insure that the College Lockshop will be available for the time and date when Contractor requests the relocation of any core(s).
- D. Door Installation: Fit hollow metal doors accurately in existing frames, within clearances specified in ANSI/SDI-1 00.
1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.
- E. Caulking width dimension shall not exceed 3/8" at any location, and under no circumstances. All new metal components shall be cut to fit within 1/4" of adjacent material or structure.

3.02 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and existing frames undamaged and in complete and proper operating condition.
- C. Any new doors or existing door framing with paint smudges or

scratches will not be accepted, and entire surfaces will be repainted and made smooth at the contractor expense, no exceptions.

END OF SECTION

SECTION 08 62 00
UNIT SKYLIGHTS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Plastic glazed dome (pyramid) curb mounted unit skylights.
- B. Fixed curb mount unit skylight with formed curb counterflashing for mounting on prefabricated roof curbs, for flat, low-slope and steep-slope roofing applications.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 "Miscellaneous Rough Carpentry" for site-built wood roof curbs and nailers for unit skylights.
- B. Division 07 roofing section for flashing and roofing terminations at unit skylight curbs.
- C. Section 07 72 00 "Roof Accessories" for manufactured metal roof curbs for unit skylights.

1.03 REFERENCE STANDARDS

- A. General: Applicable edition of references cited in this Section is current edition published on date of issue of Project specifications, unless otherwise required by building code in force.
- B. American Architectural Manufacturers Association (www.aama.net), Window & Door Manufacturers Association (www.wdma.com), Canadian Standards Association (www.csagroup.org/us/en/services)
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights (NAFS)
 - 2. CSA A440S1-09 - Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440
 - 3. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
 - 4. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum and Panels
- C. ASTM International: www.astm.org:
 - 1. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
 - 2. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings
 - 3. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain

- Walls, and Doors Under Specified Pressure Differences Across the Specimen
4. ASTM D635: Standard Test Method for Rate of Burning and/or Extent and time of Burning of plastics in a horizontal position
 5. ASTM D1929: Standard Test Method for Determining Ignition Temperature of Plastics
 6. ASTM D2843: Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics
 7. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 8. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings
 9. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 10. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 11. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
 12. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
 13. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

D. Code of Federal Regulations:

1. 29 CFR 1910.23 (e) (8) - Occupational Safety and Health Standards for Walking-Working Surfaces to Guard Floor and Wall Openings and Holes

E. Illuminating Engineering Society of North America (IESNA):
www.ies.org:

1. IESNA - The Lighting Handbook.

F. National Fenestration Rating Council:
www.nfrccommunity.org:

1. ANSI/NFRC 100 - Procedure for Determining Fenestration Product U-factors
2. ANSI/NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

G. National Fire Protection Association: www.nfpa.org:

1. NFPA 70 - National Electrical Code

1.04 COORDINATION

- A. Coordinate dimensions, locations, and details of skylight curbs specified in Section 061000 "Rough Carpentry" and specified in Section 077200 "Roof Accessories" with unit skylight curb flashings. Verify requirements for roofing system terminations.

1.05 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site prior to delivery of unit skylight and installation of roof deck.

1.06 ACTION SUBMITTALS

- A. Product Data: For unit skylights. Include standard construction details, material descriptions, performance characteristics, dimensions of individual components and profiles, and finishes.
 - 1. Include test reports of qualified independent testing agency or third party certificates verifying compliance with performance requirements.
- B. Shop Drawings: For unit skylight work. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.

1.07 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.08 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data.

1.09 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum 30 years' experience in the US manufacturing similar products in successful use on similar projects and able to provide unit skylights meeting requirements.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of skylights that fail in materials or workmanship under normal use within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, dome, and other materials beyond normal weathering.
 - b. Breakage of polycarbonate glazing.
 - c. Product leaks.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products of VELUX America LLC, Greenwood, SC 29648; www.VELUXusa.com; (800) 878-3589.
- B. Wasco Skylights. Wells ME 04090; <https://www.wascoskylights.com/>; (800) 888-3589
- C. Sunoptic, Sacramento, CA 95822; <https://sunoptics.acuitybrands.com/> (800) 289-4700
- D. Source Limitations: Obtain unit skylights through single source from single manufacturer.

2.02 PLASTIC GLAZED DOME (PYRAMID) UNIT SKYLIGHT

- A. General: Factory-assembled, curb-mounted unit consisting of plastic glazing, gasketing, inner frame designed to mount on separate curb, and self-contained flashing.
 1. Products: Provide EcoSky model CEC3 (Basis of Design) meeting the requirements of this section.
- B. Curb: Field built Curbs or Pre-Fabricated Curbs
 1. Height: Minimum 12" above finished roofing.
- C. Condensation Control: Fabricate skylight units with integral internal gutters and weeps to collect and dispose of condensation.
- D. Thermal Break: Fabricate skylight units with thermal chambered PVC.
- E. Shape and Size: As indicated by model number.
- F. Outer Glazing: Pyramid thermoformed:
 - a. Acrylic: Acrylite® Satin Sky 2 translucent.
- G. Middle Glazing: Thermoformed Dome
 - a. Acrylic: Clear.
- H. Inner Glazing: Thermoformed Dome:
 - a. Acrylic: Clear

2.03 FIXED CURB MOUNTED (FCM) UNIT SKYLIGHTS

- A. System Description: Fixed curb mounted unit skylight with a roll-formed aluminum frame counter-flashing joined by corner keys, an interior condensation drainage gasket, an insulated glass unit, structural sealant, mounting fasteners, flashing and accessories, as required to meet installation and performance requirements indicated. FCM

skylights shall be suitable for installation on roof curbs ranging from 0 degrees up to 60 degrees from horizontal.

1. Basis of Design: VELUX America, Inc, Model FCM Fixed Curb Mount Skylight.
- B. Aluminum Frame Counter-flashing: Maintenance-free, roll-formed aluminum, 15 gauge, 0.06 inch (1.5 mm) thick with neutral grey Kynar® 500 polyvinylidene fluoride resin finish. Counter-flashing frames joined with neutral grey corner keys constructed from injection molded Acrylonitrile Styrene Acrylate (ASA)-Luran.
 1. Unit Sizes: 2234 contractor shall size verify in field.
- C. Condensation Drainage Gasket: Factory applied black thermoplastic rubber gasket mounted around the entire interior aluminum frame assembly providing a thermal break weather seal and drainage for interior condensation.
- D. Insulated Glass Unit: Factory assembled with low emissivity exterior pane and clear interior pane separated by a stainless steel spacer sealing the space between panes with 95% argon gas.
 1. Exterior Pane: 0.125 inch (3mm) thick tempered glass with Neat® exterior coating and interior surface coated with three layers of low emissivity silver (LoE3) coatings.
 2. Interior Pane:
 - a. Tempered, Clear 0.125 inch (3mm) tempered glass
 - b. Laminated, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.030 inch (0.76 mm) clear polyvinyl butyral interlayer sandwiched together.
- E. Structural Sealant: Factory applied silicone sealant, black color, bonding the glass pane to the aluminum frame and suitable for external exposure.
- F. Mounting Fasteners: #8 x 1.75 inch (44 mm) stainless steel, black zinc coated, self-drilling screws provided with skylight. Field installed screws secures skylight to site built curb as indicated in manufacturer's installation instructions.

2.04 CURBS

A. Aluminum Curbs:

1. Factory insulated double wall aluminum curb, 1.5 inches in thickness with 20-gauge mill finished

aluminum exterior and 22-gauge mill finished aluminum interior. Curb factory insulated with 1.5 inches of polyisocyanurate board providing an R-value of 8.5. Width and length of curb shall be as indicated on Drawings with 16 inch curb height. Curb roof mounting flange shall be a minimum 2.75 inches in width. Basis of Design: VELUX America LLC, Model CCAM.

2.05 FALL PROTECTION AND SECURITY ACCESSORIES

- A. Interior safety screen accessory: Fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing welded to 18 gauge steel z-bar support frame continuous on each side with welded corners. Interior safety screen frame mounts to top of 1.5 inches curb with safety screen mesh located not more than 1.5 inches below top of curb. Safety screen factory primed with white finish. Safety screen shall meet fall protection requirements by supporting a minimum load of 400 pounds on any one square foot. Interior safety screen accessory width and length designation shall be as indicated on drawings. Basis of Design: VELUX America LLC, Model CRGA xxxx ICD.

2.06 PERFORMANCE REQUIREMENTS

- A. General: Provide unit skylights capable of withstanding loads as prescribed by the 2020 New York State Building Code and Energy Conservation Code of the State of New York.
1. Unit skylights must be tested in accordance with AAMA\WDMA\CSA\101\I.S.2\A440 as required by Section 2405.5 of the International Building Code.
 2. Unit skylights must be tested and certified by NFRC for thermal performance. Products must be listed on the NFRC Certified Products directory.
 3. System Performance Requirements:
 - a. Triple dome models:
 - i. U-factor shall be 0.50 (B.o.D 0.46) BTU/HR-ft²-F maximum per NFRC 100
 - ii. SatinSky2/Clear/Clear:
 1. SHGC shall be 0.40 (B.o.D 0.37) per NFRC 200
 2. Visible light transmission shall be 49% per ASTM E972
 - iii. SatinSky2/Clear/SatinIce853:
 1. SHGC shall be .35 per NFRC 200
 2. Visible light transmission shall be 46% per ASTM E972
- B. Unit Skylight Standard, FCM 4646 or smaller unit with tempered Lo-E 366 coated exterior glass pane and interior

pane as follows:

AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11 or previous):

1. Performance Grade (Primary Designator):
 - a. Tempered: "SKG-PG100 Size Tested 1308 x 1308 mm (51 x 51 in.)".
2. Design Pressure (DP):
 - a. Tempered: DP = +100/-140 psf (+4.9/-6.7 kPa)
 - b. Laminated with 0.090 inch (2.3 mm) PVB
Interlayer: DP = +100/-80 psf (+4.9/-3.83 kPa)
3. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
4. Air Leakage Rate: 0.030 cfm/ft² maximum.
5. Unit Skylight Standard, 2270 size and smaller unit with tempered Lo-E 366 coated exterior glass pane and laminated interior pane with 0.030 inch (0.76 mm) interlayer.

AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11 or previous):

6. Performance Grade (Primary Designator): "SKG-PG100 Size Tested 660 x 1854 mm (26 x 73 in.)".
7. Design Pressure (DP): +200/-100 psf (+9.58/-4.79 kPa).
8. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
9. Air Leakage Rate: 0.030 cfm/ft² maximum
10. Daylighting: Provide daylighting photometric performance comparable to basis of design product at layout indicated, based upon daylighting profile of March 21, 9:00 am local time, at Project location by simulation in accordance with IESNA guidelines.
11. Air Infiltration: Maximum air leakage through tested size of 0.030 cfm/sq. ft. (1.5 L/s/sq. m) of fixed area as determined according to ASTM E 283 at a static-air-pressure differential of 1.57 lbf/sq. ft. (75Pa.)
12. Water Penetration under Static Pressure: No evidence of water penetration through unit when tested according to ASTM E 331 at a static-air-pressure

differential of 15 lbf/sq. ft. (720 Pa).

13. Fire Ratings for Roof Assemblies with Fire Classifications: Unit skylight tested in accordance with ASTM E 108 and listed as passing Burning Brand test with target classification of Class B.
14. Energy Performance ratings for any size fixed curb mounted unit skylight with tempered Lo-E 366 coated exterior glass pane and interior pane as follows:
 - a. Thermal Transmittance: NFRC 100 maximum U-factor:
 - 1) Laminated with 0.090 inch (2.3 mm) PVB
Interlayer: 0.50 (B.o.D 0.46) Btu/hr*ft²*deg F (2.61 W/m²*deg C).
 - b. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC:
 - 1) Laminated with 0.090 inch (2.3 mm) PVB
Interlayer: 0.40 (B.o.D 0.27)
 - c. Visible Transmittance (Vt): NFRC 200 maximum Vt:
Laminated with 0.090 inch (2.3 mm) PVB
Interlayer: 0.62
15. Fall Protection Standard Compliance: 29 CFR 1910.23: Passed for all laminated fixed curb mount unit skylights.

2.07 MATERIALS

- A. Joint Sealants: As specified in Section 079200 "Joint Sealants."
- B. Mastic Sealants: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.08 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Proceed with unit skylight installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install unit skylights in accordance with manufacturer's written instructions and approved shop drawings. Coordinate installation of units with installation of substrates, air and vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that finished installation is weather tight.
 - 1. Anchor unit skylights securely to supporting substrates.
 - 2. Install unit skylights on curbs specified in another section with tops of curbs parallel to finished roof slope.
- B. Where metal surfaces of unit skylights will contact incompatible metal or corrosive substrates, including preservative-treated wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation recommended in writing by unit skylight manufacturer.
- C. For custom flashings, install unit skylight curb counter-flashing to produce weatherproof seal with curb and overlap with roofing system termination at top of curb.

3.03 CLEANING AND PROTECTION

- A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Replace glazing that has been damaged during construction period.
- C. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION

SECTION 08 62 10
FIBERGLASS SANDWICH PANEL SKYLIGHTS

PART 1 - GENERAL**1.01 DESCRIPTION OF WORK**

- A. Provide all metal framed skylight Work as indicated on the Drawings and as specified herein.

1.02 (NOT USED)**1.03 REFERENCES**

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society for Testing and Materials (ASTM)
2. National Fenestration Rating Council (NFRC)
3. International Code Council - Evaluation Service (ICC-ES)
4. American Welding Society (AWS)
5. American Architectural Manufacturer's Association (AAMA)
6. Underwriters Laboratories (UL)

1.04 SUBMITTALS

A. Product Data

Indicate properties and characteristics of all components.

B. Shop Drawings

Submit shop drawings for the fabrication and installation of all work and associated components. Include:

1. Full size details of all members, joints, anchorages and glazing details. Include field dimensions, member sizes and thickness, glazing

edge clearance, tolerances and any other information necessary to completely describe the system.

2. Coordination details for interface with adjoining or related work.
3. Erection diagrams.
4. Structural calculations to verify that the system meets the prescribed loading as outlined in Article 1.05: Design Requirements. All drawings and calculations shall bear the signature and seal of a Professional Engineer licensed in the State of New York.

C. Samples

1. Two samples of sandwich panels, large enough to indicate construction.

D. Test Reports

Manufacturer's current reports from independent testing laboratory for component products required as follows:

1. Flame Spread and Smoke Developed (UL 723)
2. Burn Extent (ASTM D635)
3. Color Difference (ASTM D2244)
4. Impact Strength (UL 972)
5. Bond Strength (ASTM C297 and ASTM D1002)
6. Accelerated Aging (ASTM E1037)
7. Beam Bending Strength (ASTM E72)
8. Insulated "U" Factor (NFRC 100)
9. Class A Roof Covering Burning Brand (ASTM E108)
10. Fall Protection (ASTM E661)
11. Condensation Resistance Factor (AAMA 1503)
12. Solar Heat Gain Coefficient (NFRC 200 & 201)
13. Evaluation Report (ICC-ES) or MEA Acceptance Report

14. Air Infiltration

E. Design Requirements

1. Professional Engineer's design certification form per paragraph 1.06.C.

F. Warranties as specified in Article 1.08.

1.05 QUALITY ASSURANCE

A. Performance Requirements

The Manufacturer shall be responsible for the design and fabrication of the skylight system in compliance with the Project Drawings and other requirements stipulated herein.

- B. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of materials of type specified, for a period of at least 5 consecutive years; and which can show evidence of these materials being satisfactorily used on at least six (6) projects of similar size, scope and type within such a period. At least three (3) of the projects shall have been in successful use for 5 years or longer.

- C. Erection shall be by an installer which has been in the business of erecting materials of type specified for at least two (2) consecutive years; and can show evidence of satisfactory completion of projects of similar size and scope.

- D. Where components of the skylight system are provided by different Manufacturers, the components shall be compatible and capable of accomplishing an acceptable completed system.

E. Regulatory Agencies

New York State Building Code, latest edition.

F. Air infiltration

When tested in accordance with NFRC 400 at a static air pressure difference of 1.57 psf, air infiltration of unit shall not exceed .03 cfm per square foot of skylight area.

1.06 DESIGN REQUIREMENTS

- A. The skylight systems shall be fabricated by the manufacturer to conform to the Drawing Details and to the following requirements:
1. Sizes and configurations: As detailed on the Drawings.
 2. Roof Slope: As detailed on the Drawings.
 3. Design Loads: Meet the applicable provisions of Chapter 13 of the 2020 NYS Building Code.
 4. Deflection of the skylight system due to wind or snow loading shall not exceed $L/60$ where "L" is the span of the member.
 5. The skylight shall be designed to sustain the combined snow and wind load without permanent distortion or deformation.
 6. Glazing Material: as specified herein and which comply with the flammability, smoke developed and toxicity restrictions of the Building Code of the State of New York.
 7. Provide for expansion and contraction due to temperature variations, of component materials over a minimum temperature range of 120°F.
- B. The Contractor or the Manufacturer shall retain a Professional Engineer licensed in the State of New York who shall be responsible for the structural design of the insulated skylight system. All shop drawings and calculations submissions pertaining to the skylight assemblies shall be signed and sealed by the Professional Engineer retained by the Contractor or the Manufacturer.
- C. The Professional Engineer shall submit the following certification form to the Engineer of Record with a copy to the Authority:

"To Whom it May Concern

Please be advised that the insulated skylight system has been adequately designed to support the design loads outlined in the project specifications."

Certification Form shall be dated, name printed and signed by the Professional Engineer with affixed P.E. seal.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products of this Section as recommended by the Manufacturer, to prevent damage.

1.08 WARRANTIES

- A. Skylight System (Complete System except for sandwich panels): 4-year written warranty against defective design, frame materials, and workmanship.
- B. Sandwich Panels: 8-year written warranty against exterior face fiber bloom, color change and panel bond integrity.
- C. Leakage: 5 years

PART 2 - PRODUCTS**2.01 MANUFACTURERS**

- A. Kalwall Corporation
- B. Structures Unlimited, Inc.
- B. Velux Group
- B. Wasco

2.02 MATERIALS

- A. Metal Framing System
 - 1. Framing Members: aluminum members, of shapes and profiles as indicated on the Drawings.
 - a. Alloy and Temper: 6063-T5 or 6063-T6 or as recommended by the Manufacturer for the respective application and finish required.
 - b. Sizes: As indicated on the Drawings and as recommended by the Manufacturer for required design loads.

Minimum metal thickness for supporting members: 0.10".
 - 2. Glazing Sealants: As recommended by the Manufacturer.
 - a. All gasketing: Shop installed.
 - 3. Fasteners: Stainless steel of a type which will not cause electrolytic action or corrosion.

Locate cap fasteners min. 12" o.c. Finish exposed fasteners to match aluminum work unless shown otherwise.

4. Brackets and Reinforcements: Provide as structurally required. Steel brackets and reinforcements shall not be used.
5. Closures and Flashing: Aluminum sheet, .040" min.
6. All aluminum shall be isolated from dissimilar metals other than stainless steel or lead-coated copper by means of min. 10 Mil Vinyl with electrolytic corrosion factor of 1.0 and temperature resistance range of -20°F to 200°F. Bituminous paint or similar type materials shall not be used.

B. Sandwich Panels

1. Glass fiber reinforced polymer faces bonded under controlled heat and pressure to mechanically interlocked thermally broken aluminum grid core, with the following characteristics:
 - a. Exterior Face: Color stable full thickness before and after application of protective coatings, with permanent glass erosion barrier and a fully field refinishable and restorable self-cleaning surface applied under factory controlled conditions.
 - b. Color Stability from Weathering: Shall not change more than 3.0 Units (Delta E by ASTM D2244), determined by an average of three white samples, with and without protective coating, after at least 60 months outdoor exposure in South Florida at 5° facing South.
 - c. Laminate Adhesive: Heat and pressure resin-type, meeting requirements of the International Code Council "Acceptance Criteria for Sandwich Panel Adhesive". Min. Strength: 750 psi tensile strength (ASTM C297) after two exposures to six cycles each of the severe aging conditions (ASTM D1037); and 400 psi shear strength average (ASTM D1002) after four prescribed exposures.
 - d. U-Factor: Panel U-factor of 0.23 by NFRC certified laboratory; light transmission of 20% and solar heat gain coefficient of 0.40.

Complete system shall have NFRC certified U-factor of 0.50.

- e. Grid Core: Thermally broken 6063-T6 aluminum alloy I-beams, minimum 7/16" flange width, mechanically interlocked to ensure even muntin-mullion intersection. Minimum thermal break shall be 1 inch. Minimum CRF of 80 by AAMA 1503 measured on the panel bond line.
- f. Exterior Face Sheet:
 - 1) Impact Resistance: min. 70 ft lbs. in accordance with UL 972 Burglar Resistance Test.
 - 2) Thickness: 0.070" (±10% tolerance)
 - 3) Color: crystal (uniform).
 - 4) Provide factory-applied performance, thermoset acrylic protective surface (min. thickness 1.2 mils) for resistance to erosion and weather. Coating shall be fully field refinishable, if damaged.
- g. Interior Face Sheet
 - 1) Thickness: 0.045" (±10% tolerance)
 - 2) Color: White (uniform)
 - 3) Flame Spread and Smoke Developed: No greater than 20 and 200, respectively (UL 723). Burn extent by ASTM D635: No greater than 1" (CC 1).
- h. Panel Construction
 - 1) Panel Thickness: 2³/₄".
 - 2) True sandwich panel of flat fiberglass sheet bonded to a grid core of mechanically interlocking thermally broken aluminum I-beams and laminated under a controlled process of heat and pressure.
 - 3) Panel deflection shall not exceed 1.9" at 30 lbs. per sq. foot loading and shall not exceed 0.10" set deflection

five (5) minutes after load release per ASTM E72 with a 10' clear span.

- 4) Grid pattern: nominal 12" x 24" shoji pattern and symmetrical about the horizontal center line of each panel.

2.03 FABRICATION

A. Construction

Extruded aluminum members; expansion joints located as required.

1. Fitting and assembly: In Manufacturer's shop. Where not possible to fit and permanently assemble Work in shop, completely assemble, mark, and disassemble before shipment to the job Site to assure proper fit and assembly in field.
2. Rafter Bars: Extruded aluminum.
3. Waterproofing: Continuous glazing gaskets applied above and below glazing. Use neoprene spacers as required, at all extrusions for glazing separation; at no point shall glazing come in contact with metal parts.
4. Weep Holes: Provide at lower portion of the extruded aluminum eave bar for drainage of condensation to the exterior.
5. Welding: Use methods recommended by AWS for aluminum to avoid discoloration at welds.
6. Fasteners: Neoprene gasketed exterior fasteners shall be 300 or 400 series stainless steel. No exposed interior fasteners.
7. Complete shop cutting, fitting, forming, welding, drilling, and grinding of all metal work prior to cleaning, finishing, treatment, and application of coatings.

2.04 FINISHES

- A. After fabrication of the metal work, prepare the surface for finishing in accordance with the recommendations of the aluminum Producer and the Finisher or Processor.
- B. Sequence the finishing process in such manner to minimize color and texture differences between adjacent components.

- C. Interior and Exterior Finish: Exposed aluminum shall receive 2 or 3 coat factory finish which meets requirements of AAMA 2604 and will provide the required warranty. Color as selected by Project Architect from Manufacturer's standard colors.

2.05 BATTENS AND PERIMETER CLOSURE SYSTEMS

- A. Extruded 6063-T6 and 6063-T5 aluminum screw clamp-tite closure system.
- B. All battens and perimeter closures to be supplied with stainless steel screws (excluding final fasteners to the building, e.g., power driven fasteners, lag-bolts).
- C. Receiving channels for self-tapping stainless steel screws to be continuous the length of each member and extruded as part of the member. Threaded receiving channel shall not be acceptable.

2.06 FLEXIBLE SEALING TAPE

- A. Sealing tape shall be manufacturer's standard pre-applied to closure system at the factory under controlled conditions.

2.07 GUTTER

- A. An internal guttering system shall be furnished and installed to control and drain water infiltration and condensation to the outside.

2.08 GASKETS

- A. As recommended by the Manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

- A. The Installer shall examine openings, measurements, supporting structure and all other conditions at skylight locations. The installer shall not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION

- A. Comply with Manufacturer's shop drawings and recommendations for installation of skylight and components.

- B. Set skylights plumb, level, and true to line, without warp or rack of frames or panels and anchor securely in place in accordance with approved shop drawings.
- C. Install sandwich panels in accordance with sandwich panel system manufacturer.
- D. Clean aluminum and sandwich panel surfaces during installation. Remove excess sealants, dirt and other soiling substances.
- E. Upon completion, carefully inspect the Work and make all necessary adjustment to ensure proper installation and weather-tight conditions.

3.03 CLEANING

- A. Upon completion:
 - 1. Clean all exposed metal component surfaces as recommended by the Manufacturer.
 - 2. Clean all sandwich panel surfaces in manner recommended by the Manufacturer.
 - 3. Clean all debris from the Work area.

END OF SECTION

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data:	_____	_____
1. Properties and characteristics of all components.		
Shop Drawings	_____	_____
1. Full size details		
2. Coordination details		
3. Erection Diagrams		
4. Structural calculations		
Samples:	_____	_____
1. Sandwich panels		
Test Reports:	_____	_____
1. Flame Spread and Smoke Developed (UL 723)		
2. Burn Extent (ASTM D635)		
3. Color Difference (ASTM D2244)		
4. Impact Strength (UL 972)		
5. Bond Strength (ASTM C297 and ASTM D1002)		
6. Accelerated Aging (ASTM E1037)		
7. Beam Bending Strength (ASTM E72)		
8. Insulated "U" Factor (NFRC 100)		
9. Class A Roof Covering Burning Brand (ASTM E108)		
10. Fall Protection (ASTM E661)		
11. Condensation Resistance (AAMA 1503)		
12. Solar Heat Gain (NFRC 200 & 201)		
13. Evaluation Report (ICC-ES) or Acceptance Report (MEA)		
14. Air infiltration		
Design Requirements:	_____	_____
1. Professional Engineer's design certification form		
Warranties:	_____	_____
1. Entire system manufacture		
2. Sandwich panel exterior face		
3. Leakage		

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SECTION 08 71 00
DOOR FINISH HARDWARE

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.02 WORK INCLUDED

- A. Work of this Section includes all labor, materials, equipment and services necessary to furnish all the door finish hardware as shown on and listed on the Drawings and specified herein. Installations shall be completed under the general contract by qualified skilled mechanics experienced with Door Finish Hardware installation and service.

1.03 RELATED SECTIONS

- A. Section 08 11 13 - "Hollow Metal Doors"
- B. Section 281300 - "Access Control"

1.04 QUALITY ASSURANCE

- A. Hardware shall be suitable and adapted to its required use and shall fit its designated location. Should any hardware as shown, specified or required fail to meet the intended requirements or require modification to suit or fit the designated location, determine the correction or modification necessary and notify the College in ample time to avoid delay in the manufacture and delivery of the hardware.
- B. For fire rated openings provide hardware complying with NFPA Standard No. 80 requirements of authorities having jurisdiction.
- C. Barrier Free Requirements: Maximum pressure applied to the latch area to open exterior doors shall not exceed five (5) pounds. Interior doors which have a self-closing feature shall require pressure not to exceed five (5) pounds.
- D. Hardware Supplier Qualifications: The hardware supplier shall have been regularly engaged in the sale and distribution of finish hardware for projects of comparable scope and size for a minimum of five (5) years. The hardware supplier shall have an

AHC of the Door and Hardware Institute on staff who will be responsible for overseeing the scheduling, detailing, ordering and coordination of finish hardware, and shall be available for consultation with the College, at no additional cost to the College, during progress of construction. The hardware supplier shall be a direct factory authorized distributor for all finish hardware items being furnished in accordance with this Specification.

1.05 SUBMITTALS

- A. Before any finish hardware is ordered or purchased, contractor shall submit catalog cuts on all hardware and a complete Hardware Schedule of Finish Hardware.
 - 1. Each item listed in the Hardware Schedule shall be identifiable with respect to manufacture, brand, catalog number, material and finish, and specific door where item will be installed, no exceptions.
 - 2. Incomplete shop drawings will be returned and not reviewed until complete, no exceptions; and it is the contractor's sole responsibility to submit required shop drawings in time and without delay to the work.
- B. Where submission differs from Schedule given herein, use different color or other means of identification to bring change to the attention of the College.
- C. Hardware: Supplier shall provide all product information, wiring diagrams and electrical data to the electrical contractor.
 - 1. Samples: Submit samples as requested by College. Do not proceed with installation until samples have been approved. Approved samples may be installed in the Work.

1.06 PRODUCT HANDLING

- A. Pack finish hardware in approved manufacturer's containers, complete with trimmings, bolts, screws, washers, etc. as required for application and securement. Each container shall bear a suitable label which shall state the quantity and kind of contents of said container, as well as identifying marks relating to the approved Hardware Schedule and it's location in the Project.
- B. Knobs, handles, pulls and other items of finish hardware with easily damaged finishes shall be individually wrapped before

placing in containers and with sufficient sheet cloth or cotton backed paper which shall be adequately tied with heavy strings, all as necessary to protect the finishes.

- C. Finish hardware shall be delivered, as directed, to the building site or the factories of the various fabricators of metal Work to which such hardware is to be applied. Deliver hardware in the order required and in ample time to permit application at the building, or fabricators' shops, within the time required for the completion of the building.

1.07 JOB CONDITIONS

- A. Field Service: The hardware supplier shall assign a competent representative, acceptable to the College, to be at the jobsite each time a major shipment of finish hardware is received. Such representative shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the jobsite when, in the opinion of the College his presence is necessary.
- B. Templates: Promptly following approval of the Hardware Schedule by the College, furnish and deliver template information to the fabricators of items to which finish hardware is to be applied.
1. Such deliveries shall be made in ample time to avoid delays in such Work of said fabricators. Provide Drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their Work to receive the finish hardware.
- C. Cooperation and Coordination:
1. Cooperate and coordinate Work with that of other trades supplying materials or performing Work in contact with, connecting to, underlying or overlaying the Work of this Section.
 2. Provide complete data of requirements for Work of this Section to those other trades whose Work is affected by or dependent upon the Work of this Section.
 3. Furnish all items to be built into other Work in ample time to avoid delaying the progress of such Work.
- D. Existing Conditions: Hardware supplier shall verify all existing conditions in the field to ensure compatibility with hardware specified in the hardware sets herein. Any discrepancies between the existing field conditions and hardware specified shall be brought to the attention of the College immediately. Hardware

supplier shall not order any hardware until all discrepancies are rectified and written approval is granted by the College.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated herein. Products are identified by using hardware appropriate hardware designation numbers.
- B. Manufacturer's are listed for each hardware type required. Provide either the product designated, or approved equal.
- C. Proprietary Products: References to specific proprietary products are used to establish minimum standards of utility and quality. Other materials may be considered by the College in accordance with the provisions of these Specifications; except where noted "NS" (No Substitutions) due to campus requirement for maintenance standard.
- D. Notwithstanding anything to the contrary in this Specification or the Drawings, the finish hardware shall conform to the requirements of governmental authorities having jurisdiction and such requirements shall be followed as if specifically set forth in this Specification.
- E. Finish hardware shall be uniform in color and finish and free from imperfections affecting it's appearance, function, operation and serviceability. Such hardware shall be suited and adapted to it's required use and shall fit it's respective location.
- F. Where the finished shape or size of members receiving finish hardware are such as to prevent or render unsuitable the use of the specific types or sizes of such hardware, suitable types of sizes shall be furnished, having as nearly as practicable the same function, operation and quality as the specified hardware.
- G. Bolts, screws and other fastenings required for the application of the finished hardware shall be of size and type to fit requirements and shall be of the same material and finish as the exposed parts of such hardware which they adjoin. Exposed screws and bolts shall have countersunk oval heads and bolts shall be provided with cap nuts. Countersunk part of screw and bolt holes shall be finished smoothly without sharp edges and form a firm seal for such screw and bolt head.

H. All items of Finish Hardware to be wholly manufactured in the United States of America to insure all parts can be obtained or replaced when needed.

2.02 PRODUCTS AND MANUFACTURERS

A. The following are acceptable manufacturers, unless specifically indicated in the hardware sets. Underlined manufacturers are those whose products are indicated in the hardware sets. No substitutions will be considered after the award of the Contract.

- | | |
|--------------------------|--|
| 1. Continuous Hinges: | Hager, Marker or Equal Quality. |
| 2. Locksets & Latchsets: | Stanley/BEST |
| 3. Closers: | Hager 5100 series Heavy Duty Closer |
| 4. Weatherstripping: | Zero, Pemko, National Guard or Equal Quality |

2.03 SPECIFIC PRODUCTS

B. Hinges:

1. Continuous Hinges: Unless otherwise specified in the hardware sets, continuous hinges shall be provided at all entrance doors, and shall be full height gear type, providing full height door support. Provide heavy duty hinges capable of supporting doors weighing up to five-hundred (500) pounds, and fabricated of extruded aluminum 6063-T5 alloy. Provide hinges with 304 stainless steel bearings with eight (8) percent carbon content for lubricity. Hinges shall be heavy non-handed, with symmetrical templated hole pattern, with twenty-one (21) fasteners on the door side and twenty-one (21) fasteners on the frame side. Hinges shall exceed ASTM Standard 156.1 cycle test for 1,500,000 repetitions. Provide hinges with manufacturer's ten (10) year warranty.

B. Surface Closers:

1. Unless otherwise indicated, closers shall not be visible on the public side of doors. Closers opening into public spaces shall be provided with parallel arms and brackets to suit.
 - a. All closers shall be non-handed, unless specified otherwise.
 - b. Closers shall be sized in accordance with the accepted manufacturer's standards to suit height, width, weight of door and draft conditions.
 - c. All rated doors must - as per code requirement - have automatic closers so that rating is maintained.

C. Locking and Latching Devices:

1. Mechanical: Provide cylindrical locks in the functions and types, as specified. Provide cast lever sets with all locking devices. Coordinate with College keying requirements.

D. Keys and Keying:

1. Supplier shall meet with the College Locksmith to finalize keying requirements and obtain final instructions in writing.
2. Keying to be coordinated with Campus Locksmith. Final cores to be delivered to Locksmith with key blanks; provide uncombined cores on projects with 30 doors or less.
2. Review the keying system with the College and provide as directed. Key pinning charts, if required for expansion of an existing system, shall be provided by the College.
3. Provide interchangeable core to comply with College's request.
 - a. Provide three (3) keys for each lock, five (5) master keys and five (5) grand master keys.
 - b. Provide visual key control stamping and permanently mark keys "do not duplicate".
 - c. Provide keys manufactured of nickel silver only.
 - d. Furnish one (1) extra key for each lock.
4. Provide all cylinders as Construction Master Keyed.
5. Provide key control system, including key cabinet by Lund Equipment Company, with capacity to store one-hundred-fifty (150) percent of keys furnished.
6. At Project end deliver all keys to the College's representative.

2.04 FINISHES

- A. Provide finish hardware with the following finishes unless otherwise shown: US 26D.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Make periodic checks during construction in order to ascertain that the finish hardware furnished has been installed correctly. After completion of all construction Work, adjust finish hardware to work properly. Test all hardware and keying and adjust as required for smooth, free operation.
- B. Install all Finish Hardware in strict accord with hardware manufacturer's instructions and recommendations.
- C. Contractor shall not leave any door unsecured overnight, and any newly installed doors must be installed complete with lockset, glazing panels(s), thresholds, and all fasteners in quantities

- recommended by the specific door manufacturer, no exceptions.
- D. Contractor shall coordinate with the College at least two days in advance the transfer date for the lockset core(s) to insure that the College Lockshop will be available for the time and date when Contractor requests the relocation of any core(s).

3.02 HARDWARE SETS

HARDWARE SET #1 **New Single Exterior Roof Access Door**

<u>ITEM</u>	<u>QUANTITY</u>	<u>MFR & CAT. NO.</u>
1. Hinges	1	Continuous, Heavy Duty by Hager, Marker or Select Only
2. Locks & Latchsets	1	Stanley/Best cores, 7-pin 1E7J4 lock cylinder, removable - NO SUBSTITUTIONS. Lever set equal to Best series 9K lever, 93K backset, 14K trim, USD26 finish. MUST ACCEPT BEST CYLINDER
3. Surface Mounted Door Closer	1	Hager 5100 Series Heavy Duty Closer

1. Contractor to provide shop drawings of all components.
2. Contractor to have meeting with College to review installations prior to any physical installation work.

END OF SECTION 08 71 00

SECTION 08 80 00
MISCELLANEOUS GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Work of this Section includes all labor, materials, equipment and services necessary to complete the miscellaneous glass and glazing as shown on the drawings and/or specified herein, including but not limited to glazing of the following:

1. Miscellaneous laminated safety glass
2. Miscellaneous polycarbonate sheet glazing

1.02 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. Flat Glass Marketing Association (FGMA).
2. Underwriters Laboratories, Inc. (UL).
3. American National Standards Institute (ANSI).
4. Federal Specifications (FS).
5. Consumer Product Safety Standard (CPSC) 16 CFR 1201
6. American Society for Testing and Materials (ASTM)

1.03 SUBMITTALS

A. Product Data

Submit manufacturer's printed product data, specifications, standard details, installation

instructions, use limitations and recommendations for each material used.

B. Samples

Glass: 12" x 12" pieces for each type of glass specified herein. All samples shall bear a label stating the name of the manufacturer, the product's brand name and thickness.

C. Quality Assurance

1. Provide test reports indicating products meet or exceed specified requirements.
2. Compatibility Test Report: From sealant manufacturer, provide test report indicating sealant compatibility with interlayer.

D. Warranties

Provide written warranties as specified herein.

1.04 QUALITY ASSURANCE

A. Compatibility of Materials

Components of glazing system shall be manufactured or recommended by one manufacturer to assure compatibility of materials.

- B. Installer: A firm with a minimum of five years experience in type of work required by this Section and which is acceptable to manufacturers of primary materials; and with a successful record of in-service installations similar in size and scope to this Project.

- C. Comply with recommendations in "Glazing Manual" and "Glazing Sealing Systems Manual" of Flat Glass Marketing Association except as shown or specified otherwise and specifically recommended otherwise by manufacturers of glass and glazing materials.

D. Safety Glazing Material (General)

Type indicated, meeting requirements of the Consumer Products Safety Commission and of ANSI Z97.1 with label on each piece.

E. Wire Glass

Provide products meeting the requirements of Underwriter's Laboratories (UL) classification marking for fire resistance.

F. Glass Thickness and Strength

Determine and provide size, thickness and strength (by heat treatment) of glass products that are certified to meet or exceed performance requirements specified in this Section. Provide units with proper thickness, edge clearance and tolerance to comply with recommendations of glass manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and standards of good practice.

1. Protect materials from moisture, sunlight, excess heat, sparks and flame.
2. Sequence deliveries to avoid delays, but minimize on-site storage.
3. Protect glass from edge damage during handling, storage, and installation.

1.06 PROJECT CONDITIONS

A. Environmental Requirements

1. Comply with glazing materials manufacturer's written recommendations regarding environmental conditions under which glazing materials shall be installed.

2. Perform work of this Section only when existing or forecasted weather conditions are within limits established by manufacturers of materials and products used.
3. Install sealants only when temperatures are within limits recommended by sealant manufacturer, except, never install sealants when temperatures are below 40°F.

1.07 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form, made out to Owner and signed by laminated-glass manufacturer agreeing to replace laminated-glass units that deteriorate within specified warranty period indicated below.
1. Warranty Period: five years from date of substantial Completion
 2. Deterioration of Laminated Glass: Defects developed from normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

PART 2 -PRODUCTS

2.01 GLASS

A. Type F Glass

1. Laminated Safety Glass complying with ASTM C1172, minimum 1/4" thick, two sheets of clear sheet glass, ASTM C1036 or ASTM C1048, Type I, Class 1, quality q3; permanently laminated together with minimum 0.060" thick sheet of clear plasticized polyvinyl butyral produced specifically for laminating glass. Laminated glazing must achieve an STC rating of minimum 35 when tested in accordance with ASTM E90.

2.02 POLYCARBONATE

A. Polycarbonate Sheet

General Electric "Lexan MR15", or Markolon 15 by
Sheffield Plastics Inc.

1. Thickness: As indicated on Drawings.
2. Color: White.

2.04 GLAZING MATERIALS

A. Sealants - General

All sealants to be used on building interior shall be low
V.O.C. in accordance with the requirements of Section
G01600.

B. For Interior channel glazing

Products: Pecora's AVW 920; Tremco's Spectrem 2 Silicone
Sealant.

Type 1 Glazing Material: Acrylic Glazing Sealant;
solvent-based, acrylic terpolymer, thermoplastic sealant;
FS TT-S-00230C, Type II, Class B, 95 percent of solids
acrylic; compounded specifically for glazing.

C. For interior glazing (option)

Type 2 Glazing Material: Acrylic-Latex Glazing Sealant;
modified latex rubber and acrylic emulsion-polymer;
compounded specifically as glazing sealant with permanent
flexibility (non-hardening), non-staining and non-
bleeding.

Products: Tremco's Tremflex 834.

D. For interior glazing (option)

Products: Pecora's BC-158 Butyl Rubber Sealant; Tremco's
Butyl Sealant.

Type 3 Glazing Material: Butyl Rubber Glazing Sealant; polymerized butyl rubber compound with inert fillers and pigments; FS TT-S-001657, Type I; solvent-based with 75 percent solids, non-sag, tack-free within 24 hours, paintable, non-staining.

Type 4 Glazing Material: Silicone sealant; Single-Component Low Modulus, Neutral-Curing Silicone Glazing Sealant. Products: GE's SilPruf SCS2000, Pecora Corporation's 864; Tremco's Spectrem 3.

E. Setting Blocks

Neoprene, 70-90 Durometer hardness, proven to be compatible with sealants used. Provide 80-90 Durometer hardness for Impact Resistant Glazing.

F. Spacers

Neoprene, 40-50 Durometer hardness, proven to be compatible with glazing materials used.

G. Compressible Filler Rod

Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

H. Cleaners, Primers and Sealers

Type recommended by glazing material manufacturer. All materials to be used on building interior shall be low V.O.C. in accordance with the requirements of Section G01600.

I. Dense Elastomeric Compression Seal Gaskets

Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of 75±5 for hollow profiles, and 60±5 for solid profiles, ASTM C864.

J. Cellular, Elastomeric Performed Gaskets

Provide extruded or molded closed cell, integral-skinned neoprene, Shore A 40±5, and 20% to 35% compression, ASTM C509.

K. Preformed Glazing Tape

Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with AAMA 804.3 with integral continuous EPDM shim. Provide preformed glazing tape in extruded tape form. Provide Tremco "Polyshim II" or approved equal.

L. Edge Blocks

Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of 55±5.

M. Miscellaneous Glazing Materials

Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.

PART 3 - EXECUTION**3.01 PREPARATION**

- A. Clean glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings not firmly bonded to substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.
- B. Inspect each piece of glass immediately before installation, and eliminate pieces with damage or face imperfections.
- C. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.02 INSTALLATION (GENERAL)

- A. Each installation shall withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects.

- B. Install glass in accordance with standards detailed in "Glazing Manual" and "Glazing Sealing Systems Manual" of Flat Glass Marketing Association except as shown and specified otherwise, and where specifically recommended otherwise by manufacturers of glass and glazing materials.
- C. Glazing channel dimensions shown are intended to provide for necessary minimum bite on glass, minimum edge clearance and adequate glazing material thickness, with reasonable tolerances. Provide correct glass size for each opening, within acceptable tolerance and necessary dimensions. Provide minimum 1" edge engagement for Impact Resistant Glass.
- D. Unify appearance of each series of lights by setting each piece to match others as closely as possible. Inspect each piece and set with pattern, draw and bow oriented in same direction as other process.
- E. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- F. Glazing channel dimensions, as indicated on Shop Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thickness, with reasonable tolerances. Adjust as required by Project conditions during installation.
- G. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- H. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- I. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

- J. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- K. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- L. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- M. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- N. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- O. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.03 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant as recommended by glass manufacturer or glass frame manufacturer.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape where noted on approved shop drawings.

3.04 DRY GASKET GLAZING

- A. Fabricate compression gasket in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal

gasket joints with sealant recommended by gasket manufacturer.

- D. Install gaskets so they protrude past face of glazing stops.

3.05 WET SEALANT GLAZING

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.07 GLAZING OF POLYCARBONATE SHEETS

- A. Install as recommended by manufacturer.

3.08 GLAZING OF ACRYLIC SHEETS

- A. Install as recommended by manufacturer.

3.09 GLAZING OF IMPACT RESISTANT GLASS

- A. Install as recommended by manufacturer.

3.11 CURE, PROTECTION AND CLEANING

- A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.
- B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

C. Replace glass that is broken, or otherwise damaged, from the time Work is started at Site until the date of physical completion.

D. Maintain glass in reasonably clean condition until date of physical completion.

Clean and trim excess glazing material from glass and stops or frames promptly after installation.

E. Clean plastic sheets as recommended by manufacturer.

F. Clean laminated glazing materials in accordance with GANA Bulletin 01-0300.

END OF SECTION

* * *

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data:	_____	_____
Manufacturer's specifications and installation instructions for each type of glazing material, including spacers and compressive filler rods		
Samples:	_____	_____
12' x 12" sample for each type of glazing material		
Quality Assurance:	_____	_____
Certifications that materials and systems comply with specified requirements.		
STC ratings for laminated safety glass and insulated laminated noise-reducing glass		
Warranties	_____	_____

* * *

SECTION 230116 - SELECTIVE HVAC DEMOLITION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions Governing All Contracts shall apply to all work of this Section.

1.02 WORK INCLUDED

- A. Furnish all labor, materials, tools and equipment and services required to complete the work of this Section as shown on the drawings and/or specified herein. In general, the work shall include but not be limited to the following:
 - 1. Removal of existing roof top unit(s)
 - 2. Removal of existing exhaust fan
 - 3. Removal of existing ductwork
 - 4. Removal of existing heating and ventilating unit
- B. Demolition and removal of existing HVAC work as shown or specified.

1.03 QUALITY ASSURANCE

- A. Applicable Standards:
 - 1. 2018 International Building Code
 - 2. 2018 International Mechanical Code
 - 3. 2020 NYS Building Code
 - 4. 2020 NYS Mechanical Code
 - 5. National Electrical Code (NEC)
 - 6. Environmental Protection Agency (EPA)
 - 7. Occupational Safety and Health Administration (OSHA).
 - 8. NYS Stretch Code

1.04 DEFINITIONS

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- A. The following words and expressions, or pronouns used in their stead shall, wherever they appear in this Contract, be construed as follows:
1. "Architectural Items" shall mean those building components which are either directly or indirectly supported by or attached to the structural components, but excluding Plumbing, HVAC and Electrical items.
 2. "Structural Items" shall mean those building components which provide support or means of attachment for themselves or for the architectural and other items, and without which the construction would collapse.
 3. "Plumbing Items" shall mean those building components comprising the various water service, drainage, fire protection, with the exception of sprinklers and similar piping systems.
 4. "HVAC Items" shall mean those building components comprising the various Heating, Ventilating and Air Conditioning (HVAC) Systems and Sprinkler Systems.
 5. "Electrical Items" shall mean those building components comprising the various lighting, power and similar electric service systems.
 6. "Fixed Equipment" shall mean any pieces of equipment, fittings, furnishings, machines, appliances and similar apparatus or devices, including the accessories or appurtenances thereof, which are riveted, bolted, screwed, welded, grouted or, otherwise, adhered, attached, anchored or fastened to any architectural or structural component of the building or to any of the utility systems or service systems thereof.

1.05 SUBMITTALS

- A. Submit the following in accordance with the requirements of the General Conditions.
- B. Procedures:
1. The procedures proposed for the execution of demolition work shall be submitted for approval. The procedures shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed and coordination with other work in progress, and timely disconnection of utility services.

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2. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operation.

1.06 CONDITION OF PREMISES

- A. The Contractor shall accept the premises as he finds them and shall complete the demolition as specified in this Section. The Owner assumes no responsibility for the conditions of the project site with its various items required to be demolished nor their continuance in the condition existing at the time of submission of proposals or thereafter.
- B. All damage or loss, whether by reasons of fire, theft or other casualty or happening to the various items required to be demolished, shall be at risk of the Contractor from and after date of Contract, and no such damage or loss shall relieve the Contractor from any obligation under the Contract to complete all demolition as herein provided.

1.07 TITLE TO MATERIALS

- A. The Contractor shall have no right or title to any of the equipment, materials or other items to be removed from the existing building unless and until said equipment, materials and other items have been removed from the premises. The Contractor shall not sell or assign, or attempt to sell or assign any interest in the said equipment, materials or other items until the said equipment, materials or other items have been removed, without the consent of the Owner.
- B. There is no guarantee by the Owner that the number of fixtures, amount of equipment or any other material of value now existing in the structures to be demolished will be present in the structures when they are demolished.
- C. The Contractor shall have no claim against the Owner because of the absence of such fixtures and materials.

1.08 DAMAGE

- A. No existing work which is not to be removed under this Contract shall be disturbed nor damaged in any way except to the extent specifically required by this Contract in order to accomplish the removals. The Contractor shall assume the risk of such disturbance or damage arising out of it or in connection with the performance of the Contract.
- B. If any such disturbance or damage occurs to the existing work, the Contractor shall promptly restore, repair and replace such

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disturbance or damage to the existing work to the satisfaction of the Engineer, without expense to the Owner.

1.09 PROTECTION OF PERSONS AND PROPERTY

- A. The existing building, structures and facilities within the areas of operation under this Contract shall be protected.
- B. All necessary temporary closures, guard rails, barricades, etc., shall be provided so as to adequately protect all workmen, employees of the building and the public from possible injury.
- C. Provide all necessary temporary partitions, enclosure coverings and the like of approved materials and construction for the exclusion of weather, dust and debris from the existing building and for confining the dust and debris to the rooms and spaces in which removal operations are being performed.
- D. No materials or debris shall be burned on the premises. No open fires, including open drum, barrel fires or salamanders, will be permitted.
- E. No dynamite, powder or other explosives shall be brought on the site.
- F. No material shall be dropped or thrown from any height.
- G. Materials shall be wet down as required to avoid any annoyance from dust, and such wetting down shall be done at least twice daily or more frequently as required by the Engineer.
- H. No load shall be placed on any existing floor, deck or ramp which will exceed the live load capacity of said floor, deck or ramp.
- I. All required precautions shall be taken to prevent damage to the existing structures to remain in place.
- J. Temporary fire protection in the form of water in buckets and fire extinguishers shall be provided during metal burning operations. The fire protection shall also be provided on the level below the area in which metal is being removed or welded:
- K. Operations involving burning of metal shall be discontinued one-half hour prior to the normal time of cessation of each day's work, and water shall be applied to such burned metal for one-half hour after the cessation of such work.
- L. Ventilation and provisions for removing smoke, fumes, etc. shall be provided while performing cutting and burning of metals. Provide fire watchman service if required by OSHA and other

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regulatory agencies. The entire procedure shall be in complete accordance with the OSHA requirements.

- M. Shoring, bracing and other supports necessary to protect existing construction shall be provided prior to commencement of operations and shall be constructed in such manner as will prevent all deflection, settlement, movement and damage to existing work.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 GENERAL

- A. Demolition of HVAC items shall be performed under this Contract.
- B. Demolition of Plumbing and Electrical items will be performed under respective Contracts.

3.02 DEMOLITION OPERATIONS

- A. Demolition work shall be performed by competent workmen experienced in this kind of work and shall be carried through to completion with due regard to the safety of the employees, of the Owner and the employees of the Contractor and Sub-Contractors and with as little nuisance as possible.
- B. Equipment, fixtures and/or miscellaneous articles as well as debris which are found on the premises and which have been abandoned by the Owner shall become the property of the Contractor, and shall be removed from the site at his sole cost and expense.
- C. Materials resulting from the demolition operations shall not be allowed to accumulate on the floors and deck surfaces, ramps, exterior grade surfaces or other parts of the premises, but shall be promptly removed and disposed of away from the premises.
- D. Include all demolition of systems and components where these are superseded by the new work. Refer to the Drawings and Specifications for the scope of new and reconnected work. The intent of this requirement is to have the Contractor disconnect, demolish and remove all exposed and concealed work where superseded by the new layouts.
- E. There is no guarantee as to the accuracy of the demolition shown on the Drawings. The demolition shall take place as per

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requirements stated above regardless of the accuracy of the demolition work so shown. Furthermore, note that not all demolition is fully defined on the Drawings.

- F. Do not remove any service, unless approved by the Engineer, until the new service is installed and in satisfactory operation.
- G. Schedule the demolition and installation in relation to the construction requirement and the other reasons in order to maintain all services at all time including heating.
- H. Provide temporary services as described in the General Conditions Governing All Contracts.

3.03 SALVAGEABLE MATERIALS

- A. The demolition and removal work shall be performed with care, so as to prevent unnecessary damage to usable materials and adjoining work.
- B. Unless otherwise indicated or specified, all materials removed from existing work in connection with the execution of the work of this Contract shall become the property of the Contractor.

3.04 REMOVAL OF ASBESTOS INSULATION

- A. Refer to Division 00 and 02 for asbestos abatement.

END OF SECTION

SECTION 230500 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. Include General Conditions, Supplementary General Conditions Division 0 and applicable parts of Division 01 for conditions and Division 23 Commissioning and requirements which may affect the work of this Section.
- B. Examine all other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other Trades affecting, or affected by work of this Section. Cooperate with such Trades to ensure the steady progress of all work under the Contract.

1.02 DEFINITIONS

- A. Words in the singular shall also mean and include the plural, wherever the context so indicates and words in the plural shall mean the singular, wherever the context so indicates.
- B. Wherever the terms "shown on drawings" are used in the specifications, they shall mean "noted", "indicated", "scheduled", "detailed", or any other diagrammatic or written reference made on the drawings.
- C. Wherever the term "provide" is used in the specifications it will mean "furnish" and "install", "connect", "apply", "erect", "construct", or similar terms, unless otherwise indicated in the specifications.
- D. Wherever the term "material" is used in the specifications it will mean any product, "equipment", "device", "assembly", or "item" required under the Contract, as indicated by trade or brand name, manufacturer's name, standard specification reference or other description.
- E. The terms "approved", or "approval" shall mean the written approval of the Engineer.
- F. The term "specification" shall mean all information contained in the bound or unbound volume, including all "Contract Documents" defined therein, except for the drawings.

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- G. The terms "directed", "required", "permitted", "ordered", "designated", "prescribed" and similar words shall mean the direction, requirement, permission, order, designation or prescription of the Engineer. The terms "approved", "acceptable", "satisfactory" and similar words shall mean approved by, acceptable or satisfactory to the Engineer. The terms "necessary", "reasonable", "proper", "correct" and similar words shall mean necessary, reasonable, proper or correct in the judgment of the Engineer.
- H. "Piping" includes in addition to pipe or mains, all fittings, flanges, unions, valves, strainers, drains, hangers and other accessories relative to such piping.
- I. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.
- J. "Exposed" means not installed underground or "concealed" as defined above.
- K. "Invert Elevation" means the elevation of the inside bottom of the pipe.
- L. "Architect" shall refer to the Architect of Record for the Project and "Engineer" shall refer to the Engineer of Record for the project and/or Owner.
- M. "Owner" shall refer to the designated representatives of the Project Owner.
- N. "Contractor" shall refer to the Contractor(s) performing work under other sections of the Contract Specifications.
- O. "Construction Manager" shall refer to the Construction Manager (CM) for this project.
- P. "Commissioning Agent (CA)" shall refer to the party employed by the Owner to witness the demonstration of all systems according to the commissioning plan. Refer to Division 23.

1.03 CODES, STANDARDS AND REFERENCES

- A. All materials and workmanship shall comply with all applicable Codes, Specifications, Local and State Ordinances, Industry Standards and Utility Company Regulations, latest editions.
- B. In case of difference between Building Codes, State Laws, Local Ordinances, Industry Standards and Utility Company Regulations and the Contract Documents, the Contractor, as
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applicable, shall promptly notify the Engineer in writing of any such difference.

- C. In case of conflict between the Contract Documents and the requirements of any Code or Authorities having jurisdiction, the most stringent requirements of the aforementioned shall govern for budgetary purposes. However, no work will proceed until the Engineer determines the correct method of installation.
- D. Should any Contractor, as applicable, perform any work that does not comply with the requirements of the applicable Building Codes, State Laws, Local Ordinances, Industry Standards and Utility Company Regulations, he shall bear all costs arising in correcting the deficiencies, as approved by the Engineer.
- E. Applicable Codes and Standards shall include all State Laws, Local Ordinances, Utility Company Regulations and the applicable requirements of the following accepted Codes and Standards, without limiting the number, as follows:
 - 1. National Electrical Code (NEC)
 - 2. Environmental Protection Agency (EPA)
 - 3. New York State -- Environmental Air Quality Protection Agency
 - 4. 2018 International Building Code
 - 5. 2018 International Mechanical Code
 - 6. 2018 International Fire Code
 - 7. 2020 NYS Building Code
 - 8. 2020 NYS Mechanical Code
 - 9. 2020 NYS Fire Code
 - 10. NYS Stretch Code
- F. In these specifications, references made to the following Industry Standards and Code Bodies are intended to indicate the accepted volume or publication of the Standard. All equipment, materials and details of installation shall comply with the requirements and latest revisions of the following Bodies, as applicable:

1. AMCA Air Moving and Conditioning Association
2. ANSI American National Standards Institute
3. ARI American Refrigeration Institute
4. ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
5. ASME American Society of Mechanical Engineers
6. ASTM American Society of Testing Materials
7. AWS American Welding Society
8. CS Commercial Standards, U.S. Department of Commerce
9. FM Factory Mutual
10. FS Federal Specification, U.S. Government
11. MSS Manufacturers Standardization Society of the Valve and Fittings Industry
12. NEMA National Electrical Manufacturers Association
13. SMACNA Sheet Metal and Air Conditioning Contractor's National Association
14. UL Underwriters' Laboratories, Inc.

G. Contractor for the work under his charge, shall give all necessary notices, obtain and pay for all permits, pay all governmental taxes, fees and other costs in connection with his work; file for necessary approvals with the jurisdiction under which the work is to be performed. Contractor shall obtain all required Certificates of Inspection for his work and deliver same to the Engineer before request for acceptance of his portion of work and before final payment is made.

H. All equipment shall be installed per manufacturer's recommendations and requirements. The Contractor shall notify the engineer in writing when they intend to deviate from manufacturer's installation guidelines. The engineer shall advise if the installation is acceptable prior to installation.

1.04 SUBMITTALS

- A. Submit detailed shop drawings or brochures for approval of equipment and material proposed to be used on this project. Furnish the number of copies required by General Conditions.
- B. Documents submitted shall show the following:
 - 1. Principal dimensions and details of construction.
 - 2. Operating and maintenance clearances.
 - 3. Weights of principal parts and total weights with information required for the design of supports and foundations.
 - 4. Sizes and location of piping and connections.
 - 5. Approval stamp of Underwriters' and other authorities having jurisdiction of Contract Drawings requiring such approval.
 - 6. Certified performance guarantees.
 - 7. Calculations and details for refrigeration for field assembled systems including description of specialties and pressure drops, layout of piping with lengths fittings, and refrigerant specialties, and capacity curves for evaporator and compressor showing balance points.
 - 8. Minimum scale for sheet metal plans and piping plans shall be $\frac{1}{4}$ inch equal 1 foot.
- C. Submit brochures that contain only that information which is relative to the particular equipment or materials to be furnished. Do not submit catalogs that describe several different items other than those items to be used unless irrelevant information is marked out and relevant material is clearly marked.
- D. Specifications Compliance Statement
 - 1. The manufacturer shall submit a point by point statement of compliance with the specifications.
 - 2. The statement of compliance shall consist of a list of all paragraphs (line by line).

3. Where the proposed system complies fully, such shall be indicated by placing the word "comply: opposite the paragraph number.
4. Where the proposed system does not comply, or accomplishes the stated function in a manner different from that described, a full description of the deviation shall be provided.
5. Where a full description of a deviation is not provided, it shall be assumed that the proposed system does not comply with the paragraph in question.
6. Submissions which do not include a point by point statement of compliance as specified shall be disqualified.

1.05 GUARANTEE

- A. Attention is directed to provisions of the General Conditions and Supplementary General Conditions regarding guarantees and warranties for work under this Contract.
- B. Manufacturers shall provide their standard guarantees for work under this Contract, unless specified otherwise. However, such guarantees shall be in addition to and not in lieu of all other liabilities which the manufacturer and Contractor for managed contracts may have by Law or by other provisions of the Contract Documents. In any case, such guarantees and warranties shall commence when the Owner accepts the various systems, as applicable and as determined by the Engineer. The guarantees and warranties will remain in effect for a minimum period of (1) year thereafter except where longer periods are specifically stated and specified.
- C. All materials, items of equipment and workmanship furnished under HVAC, shall carry the warranty against all defects in material and workmanship. Any fault due to defective or improper material, equipment, workmanship or design which may develop shall be made good, forthwith, by and at the expense of the Contractor responsible, including all other damage done to areas, materials and other systems resulting from this failure.
- D. Contractor shall guarantee that all elements of the systems provided under his Contract, are of sufficient capacity to meet the specified performance requirements as set forth herein or as indicated on the drawings.
- E. Upon receipt of notice from the Owner of failure of any part of the systems or equipment during the guarantee period, the

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affected part or parts shall be replaced by the responsible Contractor.

- F. Contractor shall furnish, before the final payment is made, a written guarantee covering the above requirements.

1.06 COMMISSIONING

- A. The TBA Contractor must also include sufficient man-hours within their bids, for their participation with the Commissioning Team and the rebalancing/readjusting/resetting all device setpoints, as required. For additional work, refer to Section 230800

1.07 THE CONTRACTOR

- A. Contractor shall base his bid on site examinations performed by him. This requirement is mandatory. Contractor shall visit the proposed site where work is scheduled to be performed and ascertain for himself the amount of work required to fulfill the intent of his Contract and the complexity of the installation. Contractor shall not hold the Engineer, his Consultants, agents or employees responsible for or bound by, any schedule, estimate or for any plan thereof. Contractor shall study all Contract Documents (HVAC, Plumbing, Fire Protection, Electrical, Communications, Architectural, Structural), etc., to determine exactly the extent of work to be provided under each Section, and in installing new equipment and systems and coordinating the work with the other Trades and existing conditions.
- B. Contractor shall faithfully execute his work according to the terms and conditions of the Contract and specifications and shall take all responsibility for and bear all losses resulting to him in the execution of his work.
- C. Contractor shall be responsible for the location and performance of work provided under his Contract as indicated on the Contract Documents. All parties employed directly or indirectly by Contractor shall perform their work according to all the conditions as set forth in these specifications.
- D. Contractor shall furnish all materials and perform all work in accordance with the project specifications and any supplementary documents provided by the Engineer. The work shall include every item shown on the drawings and/or required by the specifications as interpreted by the Engineer. All work and materials furnished and installed shall be new and of the best quality and workmanship. Contractor shall cooperate with the Engineer so that no

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error or discrepancy in the Contract Documents shall cause defective materials to be used or poor workmanship to be performed.

1.08 COORDINATION OF WORK

- A. Contractor shall compare his drawings and specifications with those of other Trades and report any discrepancies between them to the Engineer and obtain from the Engineer written instructions for changes necessary in the mechanical or electrical work, to ensure that all work is installed in coordination and cooperation with other Trades installing interrelated work. Before installation, Contractor shall make proper provisions to avoid interferences in a manner approved by the Engineer. All changes required in the work of Contractor caused by his negligence, shall be corrected by him at his own expense, to the Engineer's satisfaction.
 - B. Locations of piping, ductwork, conduits and equipment shall be adjusted to accommodate the new work with interferences anticipated and encountered during installation. Contractor shall determine the exact routing and location of his systems prior to fabrication or installation of any system component. Accurate measurements and coordination drawings will have to be completed to verify dimensions and characteristics of the various systems' installations.
 - C. Lines which pitch shall have the right-of-way over those which do not pitch. For example, waste piping shall normally have the right-of-way. Lines whose elevations cannot be changed shall have the right-of-way over lines whose elevations can be changed.
 - D. Offsets, transitions and changes of direction in all systems shall be made as required to maintain proper headroom and pitch of sloping lines whether or not indicated on the drawings. Contractor shall provide manual air vents and drains as required for his work to effect these offsets, transitions and changes in direction, as applicable.
 - E. All work shall be installed in a way to permit removal (without damage to other parts) of coils, filters, control appurtenances, fan shafts and wheels, filters, belt guards, sheaves and drives and all other system components provided under this Contract requiring periodic replacement or maintenance. All piping shall be arranged in a manner to clear the openings of swinging overhead access doors, ceiling tiles and cleaning access doors in ductwork.
- 1. Access to any and all components requiring servicing, adjustment, calibration, maintenance or periodic replacement shall be provided so that the Owner's
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operations personnel can freely gain access without removal of any materials other than the access panel or ceiling tile. Access shall be understood to mean free, clear and unobstructed from the floor up to the device and/or component being serviced.

- F. The Contract Drawings are diagrammatic only intending to show general runs and locations of piping, ductwork, equipment, terminals and specialties and not necessarily showing all required offsets, details and accessories and equipment to be connected. All work shall be accurately laid out with other Trades to avoid conflicts and to obtain a neat and workmanlike installation which will afford maximum accessibility for operation, maintenance and headroom.
- G. Where discrepancies in scope of work as to what Trade provides items, such as starters, disconnects, flow switches, electric control components, etc., exist, such conflicts shall be reported to the Engineer prior to signing of the Contract. If such action is not taken, Contractor, as applicable, shall furnish such items as part of his work, for complete and operable systems and equipment, as determined by the Engineer.
- H. Where drawing details, plans and/or specification requirements are in conflict and where pipe or duct sizes of same pipe or duct run are shown to be different between plans and/or between plans and sections or details, the most stringent requirement will be included in the Contract. HVAC systems and equipment called for in the specification and/or shown on the drawings shall be provided under this Contract as if it were required by both the drawings and specifications. However, prior to ordering or installation of any portion of work which appears to be in conflict, such work shall be brought to Engineer's attention for direction as to what is to be provided.
- I. Final location of all air distribution devices, thermostats, heaters, control devices, sprinkler heads, etc., shall be coordinated with the Architectural reflected ceiling plans and/or other Architectural details, as applicable. (**Note:** Sprinkler head locations shall provide the specified coverage rating and water flow density, and shall be in accordance with all applicable Codes and in full compliance with the requirements of the Owner's insurance carrier.) Offsets of ductwork, added sheet metal, fittings, elbows, flexible connections, etc., shall be provided as required to comply with the Architectural reflected ceiling plans and/or installation details. Obtain approval of locations of all devices from Engineer in the field, prior to installation.

1.09 COORDINATION DRAWINGS

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- A. Before materials are purchased, fabricated or work is begun, Contractor shall prepare coordination drawings for all floors/areas(all-Trade-composite at ¼" scale), showing the size and location of his equipment and lines, in the manner described herein under General Requirements.
- B. Coordination drawings are for the Contractor and Engineer's use during construction and shall not be construed as shop drawings or as replacing any shop drawings. The coordination drawings, when corrected for actual "as-built" conditions, will be reviewed by the Engineer, corrected and become the Record Drawings to be submitted to the Owner for his use.
- C. The cost of producing and reproducing the drawings will be included under the Contract, including the cost or preparation of the Architectural building outlines. The Contractor shall take the lead to show all ductwork, piping, etc., and circulate the drawings to any of his Subcontractors so that they can indicate all their work as directed by the Contractor and Engineer as required, to result in a fully coordinated installation.
- D. In addition to the regular coordination drawing review, the mechanical work will also be reviewed by the Engineer to ensure that the system and equipment arrangements are suitable to provide maintenance access and service as follows:
 - 1. Valves and instrumentation should be grouped where possible and positioned in accessible locations.
- E. Prepare a complete set of computer based AutoCad (Latest Version) drawings at scale not less than ¼" scale equals 1'-0", showing basic layout for the structure and other information as needed for preparation of Coordination Drawings. The drawings shall indicate the layout of all specialty tradework as indicated herein and shall be designated as Coordination Drawings. The Contractor shall provide a minimum of two (2) weeks notice to the engineer for preparation of the disk. A signed liability release form will be required from the Contractor prior to the release of the disk from the engineer.
- F. The main paths for the installation or removal of equipment from mechanical and electrical rooms shall be clearly indicated on the Coordination Drawings.
- G. Each of the specialty trades shall add its work to the base drawings with appropriate elevations and grid dimensions. Specialty trade information shall be required for fan rooms and mechanical rooms, horizontal exits from duct shafts,

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crossovers and for spaces in the above ceilings where congestion of work may occur such as corridors and, where required, entire floors. Drawings shall indicate horizontal and vertical dimensions to avoid interference with structural framing, ceilings, partitions and other services. Indicate elevations relative to finish floor for bottom of ductwork.

1. Specialty Trade shall include:
 - a. Plumbing system.
 - b. HVAC piping and associated control systems.
 - c. Electrical.
 - d. Sheet Metal Work.
 - e. Fire Protection system.
 - f. Automatic Temperature Control
 - g. Fire Alarm
- H. Upon completing their portion of the Coordination Drawings, each specialty trade shall sign, date and return Coordination Drawings to the Contractor.
- I. Where conflicts occur with placement of materials of various trades, the Contractor shall be responsible to coordinate the available space to accommodate all trades. Any resulting adjustments shall be initialed and dated by the affected specialty trade Subcontractor. The Contractor shall then final date and sign each drawing.
- J. Fabrication shall not start until Coordinate Drawings have been distributed to all parties as indicated herein.
- K. Format: Coordination Drawings (plans only) shall be done using CAD in AutoCAD (Latest Version), in either IBM or Mac Format. Disks shall be given to the Engineer for future transfer to Owner. Coordination Drawings will be used as base for as-built drawings.
- L. Distribution of Coordination Drawings:
 1. The Contractor shall provide one print of each Coordination Drawing to:
 - a. Each specialty trade Subcontractor.

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- b. Owner.
 - c. Contractor.
 - d. Engineer (for record purposes).
- M. After distribution:
 - 1. Resolve all interference's not previously identified.
- N. Coordination Drawings include but are not necessarily limited to:
 - 1. Structure.
 - 2. Ceiling layout and heights.
 - 3. Light fixtures.
 - 4. Access panels.
 - 5. Sheet metal, heating coils, heat pumps, grilles, diffusers, etc.
 - 6. Soil, waste and vent piping.
 - 7. Major electrical conduit runs, panel boards, feeder conduit and racks of branch conduit. Motor control centers, starters and disconnects.
 - 8. Sprinkler piping and heads.
 - 9. All equipment, including items in the Contract as well as O.F.C.I. and O.F.I. items.
 - 10. Equipment located above finished ceiling requiring access for maintenance and service. In locations where acoustical lay-in ceilings occur indicate areas in which the required access area may be greater than the suspected grid systems.
 - 11. Existing conditions, including, but not limited to, Mechanical, Plumbing, Fire Protection and Electrical items.
- O. The Engineer's response to all requests for information (RFI's) generated by the contractors shall be distributed to all other affected trades as if this information was contained in the original contract documents. In other

words, the party that issues an RFI is responsible for distributing the information to all affected parties.

1.10 RECORD DRAWINGS

- A. Contractor shall maintain, current at the site, a set of Contract Drawings for his portion of the work on which he shall accurately show the actual installation of all work provided under his Contract indicating any variation from the Contract Drawings, in accordance with the General Conditions and Supplementary General Conditions. Changes whether resulting from formal change orders, requests for information, or other instructions issued by the Engineer shall be recorded. Include changes in sizes, location and dimensions of piping, ducts, equipment, etc.
- B. Contractor shall indicate progress by coloring-in various pipes, ducts and associated appurtenances exactly as they are erected. This process shall incorporate both the changes noted above and all other deviations from the original drawings whether resulting from job conditions encountered or from any other causes.
- C. The marked-up and colored-up prints will be used as a guide for determining the progress of the work installed. They shall be inspected periodically by the Engineer and Owner's representatives and they shall be corrected if found either inaccurate or incomplete. This procedure is mandatory. Marked up drawings shall include all flow diagrams, schedules, details and control diagrams.
- D. Contractor shall meet at a minimum on a monthly basis, with the Owner's representative to transfer the information from his HVAC, Plumbing, Fire Protection, etc., marked-up and colored-up prints to a set which will become the basis for preparation of as-built drawings.
- E. Upon completion of the project, Contractor shall submit his marked-up drawings to the Engineer for review and comment. After the Engineer reviews and comments on this set of documents, Contractor shall prepare as-built drawings on CAD using AutoCAD (Latest Version). When the work is completed, Contractor shall provide 2 hard copies to the Engineer for submittal to the Owner and disks with all documentation and a set of reproducible drawing plots marked "As-Built" drawings. The Contractor shall bear all costs of producing the CAD "As-Built" drawings, providing all necessary drawing changes and printing the reproducible drawings for the work under his charge.

1.11 GIVING INFORMATION

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- A. Contractor shall keep himself fully informed as to the shape, size and position of all openings required for his apparatus and shall give information to the Engineer and or Subcontractors sufficiently in advance of the work so that all openings may be built in advance.
- B. The manufacturers listed within this specification have been preselected for use on this project. No submittal will be accepted from a manufacturer other than those specified. Should any Contractor wish to propose a substitution during the bid period, such request shall be made in writing to the Engineer, at least (15) working days, prior to bid date. If substitutions are deemed acceptable, such items shall be issued as an Addendum, prior to bid due date. The above requirement is mandatory.

1.12 EQUIPMENT AND MATERIALS

- A. Equipment and materials shall be delivered to the site and stored in original sealed containers, suitably sheltered from the elements, but readily accessible for inspection by the Engineer until installed. All items subject to moisture damage such as controls, filters, etc., shall be stored in dry, heated spaces.
- B. Contractor shall have his equipment tightly covered and protected against dirt, water and chemical or mechanical injury and theft. At the completion of the work, equipment and materials shall be cleaned, polished thoroughly and turned over the Owner in a condition satisfactory to the Engineer. Damage or defects developing before acceptance of the work shall be made good at each Subcontractor's expense as applicable.
- C. Contractor shall make necessary field measurements to ascertain space requirements, for equipment and connections to be provided under his Trade and shall furnish and install such sizes and shapes of equipment to allow for the final installation to conform to the drawings and specifications.
- D. Manufacturers' directions shall be followed completely in the delivery, storage, protection and installation of any equipment. Promptly notify the Engineer in writing of any conflict between any requirements of the Contract Documents and the manufacturer's directions and obtain the Engineer's written instructions before proceeding with the work. Should Contractor perform any work that does not comply with the manufacturer's directions or written instructions from the Engineer, he shall bear all costs arising in correcting any deficiencies that should arise.

- E. Contractor shall furnish and install all equipment, accessories, connections and incidental items necessary to fully complete the work under his Contract for use, occupancy and operation by the Owner.
- F. Where equipment of the acceptable manufacturers requires different arrangement or connections from those shown, it shall be the responsibility of Contractor to install the equipment to operate properly and in harmony with the original intent of the drawings and specifications. When directed by the Engineer, Contractor shall submit drawings showing the proposed installation. If the proposed installation is approved, Contractor shall make all necessary changes in all effected related work provided under other Sections including location of roughing-in connections by other Trades, electrical requirements, piping, supports, insulation, etc. All changes shall be made at no increase in the Contract amount or additional cost to the other Trades and/or Owner.
- G. All equipment and materials required for installation under these specifications shall be new and without blemish or defect. Equipment and materials shall be products which will meet with the acceptance of the Authorities having jurisdiction over the work and as specified hereinbefore. Where such acceptance is contingent upon having the products listed or labeled by FM, UL or other testing laboratories, the products shall be so listed or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, a first class standard article shall be provided.
- H. All equipment of one type (such as valves, fans, roof top units, etc.), shall be the product of one manufacturer.
- I. Equipment repurchased on behalf of the Owner or by the Owner himself, if assigned to Contractor, shall be received, inspected, installed, etc., as if it was purchased by the Contractor as applicable. All guarantees, service contracts, etc., shall be the same as for all other equipment provided under this Contract.

1.13 CUTTING AND PATCHING

- A. Contractor shall be responsible for all core drilling, as required for work under his Contract, but in no case shall he cut into any structural elements without the written approval of the Engineer.
- B. All cutting, rough patching and finish patching, shall be provided under this Contract.

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- C. All concrete and masonry equipment bases, shall be provided under this Contract.

1.14 USE OF PREMISES

- A. Contractor shall confine all of his apparatus, storage of materials and construction to the limits indicated on the drawings and directed by the Engineer and he shall not encumber the premises with his materials.
- B. In storing materials within areas (structure or ground), or when used as a shop, Contractor shall restrict his storage to space designated for such purposes. Contractor will be held responsible for repairs, patching or cleaning arising from any unauthorized use of premises.
- C. Notwithstanding any approvals or instructions which must be obtained by Contractor from the Engineer in connection with use of premises, the responsibility for the safe working conditions at the site shall remain Contractor's. The Engineer or Owner shall not be deemed to have any responsibility or liability in connection therewith.
- D. Air handling unit or cooling tower sections shall not be used for storage of materials. The Contractor will be responsible for securing, and maintaining the equipment clean. The above requirement is mandatory.

1.15 PROTECTION/CLEANLINESS

- A. All materials such as valves, fittings, piping, ductwork, plenums, grilles, registers, diffusers, etc., shall be properly protected from the accumulation of dirt, dust, debris or any other contaminants. All ductwork and piping openings shall be temporarily closed by Contractor or Subcontractor installing same, so to prevent obstruction and damage, as a minimum at the end of each working day or more often if required by job conditions. Contractor shall take precautions to protect his materials from damage and theft.
- B. Contractor shall furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or electrical systems provided under his Contract.

1.16 DAMAGE CORRECTION AND EXTRA WORK

- A. Contractor shall be held responsible and shall pay for all damages caused by his work to the new and existing building structures and new and existing equipment, piping, duct systems, etc., and all work and finishes installed under

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this Contract in the new or in existing building. Repair of such damage shall be done as herein before specified, at the expense of Contractor and to the Engineer's satisfaction.

- B. Contractor shall promptly correct all work provided under his Contract and rejected by the Engineer as defective or as failing to conform to the Contract Documents whether observed before or after completion of work and whether or not fabricated, installed or completed. Contractor shall bear all costs of correcting such rejected work.
- C. No claim for extra work will be allowed unless it is authorized by the Engineer in writing before commencement of the extra said work.

1.17 TOUCH-UP PAINTING

- A. Contractor shall thoroughly clean all equipment and systems provided under this Contract from rust, splatters and other foreign matter or discoloration, leaving every part of each system in an acceptable prime condition. Contractor, for the work under his Contract, shall refinish and restore to the original condition all equipment and piping which has sustained damage to the manufacturer's prime and finish coats of paint and/or enamel.

1.18 DUCT AND PIPE SLEEVES, PLATES AND ESCUTCHEONS, FIRESTOPPING AND SMOKEPROOFING

- A. Where piping and/or ductwork pass through masonry or concrete walls or drywall partitions or floors, Contractor shall provide and set individual sleeves for each pipe or duct and all other work under his charge, as necessary for passage of all pipes and/or ducts. Sleeves shall be of sufficient size to provide 1/2" air space around the pipe or duct passing through (including insulation where pipes or ducts are internally/externally insulated). All openings shall be sealed, smoke proofed and made tight. Contractor shall be responsible for the exact location of sleeves provided under his Contract and shall coordinate all requirements for piping and ductwork sleeves.
- B. Contractor, for work under his charge, shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabrication or installation.
- C. Sleeves and inserts shall not be used in any portions of the building, where their use would impair the strength or construction features of the building. Elimination of sleeves must be approved by the Engineer.

- D. Provide chrome plated brass escutcheons with set screw for exposed piping, in all areas except in mechanical rooms. In this area use plain brass or cast iron escutcheons suitable for painting. All escutcheons shall be sized to fit the bare pipe or insulation in a snug and neat manner. They shall be of sufficient size to cover sleeved openings for the pipes and of sufficient depth to cover sleeves projecting above floors. Escutcheons shall be as manufactured by Beaton & Caldwell, Dearborn Brass, or Grinnell.

1.19 MISCELLANEOUS IRON AND STEEL

- A. Each trade shall provide all primary and secondary steel supports and hangers as shown on the drawings and/or as required to support equipment, ductwork, piping, exhaust fans, or any other materials provided under the work of this Section.
- B. The work of this Section of designing, furnishing and installing all miscellaneous metal work associated with the system, and related items as indicated on the drawings and/or as specified herein, and includes, but is not limited to the items listed herein below.
- C. The scope of work shall include:
1. Intermediate beams to hang ductwork and piping from the roof. All piping and ductwork must be hung from beam or supported from the floor. Provide supplemental steel for support of equipment.
 2. Support of ductwork and piping in shafts in addition to support provided by structure.
 3. Support of ductwork via floor stands as required.
 4. Hangers, brackets, angel irons or rods required for the support and protection of HVAC, plumbing and fire protection equipment.
 5. Field prime painting of galvanized steel and field finish painting.
- D. Shop Drawings for General Miscellaneous Items
1. Submit Shop Drawings of all miscellaneous metal items to Engineer for approval, showing sizes and thickness of all members, types of materials, methods of connection and assembly, complete dimensions, clearances, anchorage, relationship to surrounding

work by other Trades, shop paint, and other pertinent details of fabrication and installation.

- E. The Contractor shall engage the services of a Professional Engineer registered within the state wherein the project is located to prepare complete Design Drawings and structural design computations based on, and closely following, the design and details on the Drawings. The Design Drawings and structural design computations, with the Engineer's seal affixed thereto, shall be submitted to the Engineer for review. The structural design computations shall provide a complete structural analysis, including anchors and fastening devices, and shall certify as to conformation to governing laws and codes. These submittals, upon review, must be sufficient, when taken in conjunction with this Specification to provide the complete basis of the fabrication and erection.
- F. Samples
1. Submit duplicate samples of all materials to be furnished under this Section if, and in size and form, requested by Engineer.
- G. Do not order materials or begin fabrication until Engineer's approval of submittals has been obtained.
- H. In addition to the governing laws and codes, the following Specifications and Codes form a part of this Specification:
1. American Iron and Steel Institute applicable standards.
 2. American Institute of Steel Construction "Code of Standard Practice for Steel Buildings and Bridges" and "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".
 3. American Welding Society Code: Standard Code for Arc and Gas Welding in Building Construction.
- I. All materials shall be new stock, free from defects impairing strength, durability or appearance and of best commercial quality for each intended purpose.
1. Unless other wise specifically called for, work of this Section shall be fabricated of structural steel conforming to ASTM Specification A36.
 2. Steel pipe shall be seamless steel pipe conforming to ASTM Specification A53, Schedule 40.

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3. Steel tubing shall be seamless steel tubing conforming to ASTM Specifications A500 to A501.
 4. Construction specialties such as slotted inserts, wedge inserts, etc., shall be as manufactured by Hohmann and Barnard, Gateway Erectors, Inc., Richmond Screw Anchor Co. or equal approved by Engineer.
 5. Non-ferrous metals shall be as specified under descriptions of specific items, herein below.
- J. Provide all anchors, bolts, sockets, sleeves, and other parts required for securing each item of work of this Section to the construction, including furnishing to concrete workers all required insets and sleeves for use at concrete.
1. All exposed fastenings shall be of the same material and finish as the metal to which applied, unless otherwise noted.
 2. Welding rods shall conform to AWS Standards and the recommendation of the welding rod manufacturer.
 3. Shop primer for other ferrous surfaces shall be a high-quality, lead-free, rust-inhibitive primer, Tnemec No. 10-99 Metal Primer or equivalent by Devoe and Reynolds Co., Caroline or approved equal.
- K. Metal surfaces shall be clean and free from mill scale, flake, rust and rust pitting. metal work shall be well formed and finished to required shape and size, true to details, with straight, sharp lines and angles and smooth surfaces. Curved work shall be true radii. Exposed sheared edges shall be eased.
- L. Weld all permanent connections. Welds shall be continuous on all exposed surfaces and where required for strength on concealed surfaces. Exposed welds shall be ground flush and smooth, with voids filled with metallic filling compound (metallic filling compound not permitted on surfaces to receive hot-dip galvanizing). Tack-welding will not be permitted unless specifically called for. Do not use screws or bolts where they can be avoided. Where used, heads shall be countersunk, screwed up tight, and threads nicked to prevent loosening.
- M. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water.

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- N. Do all cutting, punching, drilling and tapping required for attachment of anchor bolts and other hardware and for attachment of work by other Trades. All such cutting, punching, drilling, etc., shall be done prior to hot-dip galvanizing of the various components.
- O. Live loads shall be not less than the minimum required by law. Where specific live load are not set forth in the laws and codes applicable to this work, and are not given on the Drawings or in this Specification, designs shall be such as to support the live loads which may normally be imposed without failure, without deflection of more than $1/360$ of length of any member, and without permanent deformation, all with a factor of safety of not less than $2 \frac{1}{2}$ to 1.
- P. Shop Painting
1. All ungalvanized ferrous metals under this Section shall be given a shop coat of rust inhibitive primer of type specified above.
 - a. Immediately before shop painting, remove all rust, loose mill scale, dirt, weld flux, weld spatter, and other foreign material with wire brushes and/or steel scrapers. Power tool clean in accordance with SSPC SP-3 (Power Tool Cleaning). Remove all grease with oil by use of solvent recommended by paint manufacturer. Sandpaper exposed surfaces as required to produce smooth, even finishes.
 - b. Apply paint by spray process in strict accordance with manufacturer's printed instructions to uniform thickness(es) recommended by manufacturer. Apply thoroughly and evenly and work well into corners and joints taking care to avoid sags and runs.
 - c. Do not paint surfaces to be embedded in concrete, or to be welded in the field. After field welds are complete, grind smooth and flush, thoroughly clean and then apply specified primer over all unprimed in the field by brush roller.
 - d. After erection, sand smooth and retouch all portions of the shop coats chipped or damaged during erection, and coat all field welds and connections with primer equivalent to that used for the shop coat.
- Q. Installation

1. All materials shall be carefully handled and stored under cover in manner to prevent deformation and damage to the materials and to shop finishes, and to prevent rusting and the accumulation of foreign matter on the metal work. All such work shall be repaired and cleaned prior to erection.
2. Work shall be erected square, plumb and true, accurately fitted, and with the tight joints and intersections. All anchors, inserts and other members to be set in concrete or masonry shall be furnished loose by this Trade to be built-into concrete and masonry and by those Trades as the work progresses. Later cutting or drilling shall be avoided wherever possible.
3. All metal work shall be rigidly braced and secured to surrounding construction, and shall be tight and free of rattle, vibration, or noticeable deflection after installed.
4. Where members, other than expansion bolts or inserts, are fastened into concrete, set such members in holes formed as specified below, and secure permanently in place by installation of proprietary-type expanding grout manufactured specifically for such purpose, used strictly in accordance with manufacturer's directions. Holes to receive members shall be formed with galvanized sheetmetal sleeves, expanded polystyrene foam, or other approved method to provide at least 1/2 inch clearance around entire perimeter. At exposed applications, hold expanding grout back 1/2 inch from finish surface and fill voids with Portland cement grout to match color and texture of surrounding concrete surface.
5. Electrolytic Isolation
 - a. Where dissimilar metals are to come into contact with one another, isolate by application of a heavy coating of bituminous paint on contact surfaces in addition to shop coat specified above. Do not permit the bituminous paint in any way to remain on surfaces to be exposed or to receive sealant.

R. Description of Major Items

1. The items described below constitute the major part of the work of this Section, but are not intended or implied to cover each and every item that may be

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required to properly complete the work. Carefully review the Drawings to determine the full extent of the miscellaneous metal work required.

S. Miscellaneous Items

1. Carefully review all Drawings for miscellaneous metal items required but not specifically listed above, such as miscellaneous steel clip angles, miscellaneous steel bracketing, and other miscellaneous metal items as indicated on the Drawings, reasonably implied therefrom, or reasonably necessary for the thorough completion of the work.
2. Provide rigid and secure anchorage of all components whether or not specifically described in complete detail on the Drawings.

T. Piping supports shall be coordinated with the building structure and shall span between roof beams as required.

1.20 WATERPROOFING, FLASHING AND COUNTERFLASHING

- A. Unless specifically indicated otherwise on the drawings, Contractor shall provide all counterflashing and waterproofing of all piping, ductwork and equipment provided by him, which pierce roofs, walls and other weatherbarrier surfaces.
- B. All work shall be performed in a workmanlike manner to ensure weatherproof installation. Any leaks developed due to Contractor's work shall be repaired at his expense, to the Engineer's satisfaction.
- C. Pipes passing through slabs shall have the sleeve extended above floors as hereinbefore specified to retain any water and the space between the pipe and sleeve caulked waterproof fire stopping. The top and the bottom shall be sealed with monolastic caulking compound.
- D. All flashing required for ductwork and piping penetrations shall be provided by the Contractor.

1.21 ELECTRICAL WORK, MOTORS, MOTOR CONTROLLERS

- A. See Divisions 26 for Electrical.

1.22 IDENTIFICATION OF MATERIALS

- A. See Section 230553.

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1.23 VALVE TAGS, NAMEPLATES AND CHARTS

- A. See Section 230553.

1.24 PARTS LIST AND INSTRUCTIONS FOR OPERATION AND MAINTENANCE

- A. Contractor shall thoroughly instruct the representative(s) of the Owner, to the complete satisfaction of the Engineer, in the proper operation of all systems and equipment provided by him. Contractor shall make arrangements, via the (GC / CM) as to whom the instructions are to be given in the operation of the basic and auxiliary systems and the periods of time in which they are to be given. The Engineer shall be completely satisfied that the representative of the Owner has been thoroughly and completely instructed in the proper operation of all systems and equipment before final payment is made. If the Engineer determines that complete and thorough instructions have not been given by Contractor to the Owner's representative, then Contractor shall be directed by the Engineer to provide whatever instructions are necessary until the intent of this paragraph of the specification has been complied with. All time required for Owner's instruction to satisfy the above requirements shall be included in this Contract. No extra compensation for such instructions will be allowed.
- B. Contractor, shall submit to the Engineer for approval, a total of (6) typed sets, bound neatly in loose-leaf binders, of all maintenance and operating instructions for the installation, operation, care and maintenance of all equipment and systems. All data and literature furnished shall be specific for the make and model of the equipment furnished. General non-specific catalog data will not be acceptable. Information shall indicate possible problems with equipment and suggested corrective action. The manuals shall be indexed for each type of equipment. Each section such as fans, valves, plumbing fixtures, hot water heaters, boilers, air handling units, etc., shall be clearly divided from the other sections. A sub-index for each section shall also be provided. The methodology of setting-up the manuals shall be submitted to the Engineer and Owner through the Contractor for approval prior to final submission of manuals.
- C. The instructions shall contain information deemed necessary by the Engineer and shall include, but not be limited to, the following:
1. Instructional classes on equipment and systems operation for Owner's representative and maintenance personnel, by engineering staff of Contractor. Minimum

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of 8 hours of instruction for minimum of (6) people.
Instruction shall include:

- a. Explanation of manual and its use.
 - b. Summary description of the HVAC systems.
 - c. Purpose of systems.
2. System
- a. Detailed description of all systems.
 - b. Illustrations, schematics, block diagrams, catalog cuts and other exhibits.
3. Operations
- a. Complete detailed, step-by-step, sequential description of all phases of operation for all portions of the systems, including start-up, shutdown, adjusting and balancing. Include all posted instruction charts.
4. Maintenance
- a. Parts list and part numbers.
 - b. Maintenance, lubrication and replacement charts and manufacturer's recommendations for preventive maintenance, as applicable to his work.
 - c. Troubleshooting charts for systems and components.
 - d. Instructions for testing each type of part.
 - e. Recommended list of on-hand spare parts.
 - f. Complete calibration instructions for all parts and entire systems.
 - g. Instruction for charging, filling, draining and purging, as applicable.
 - h. General or miscellaneous maintenance notes.
5. Manufacturer's Literature

- a. Furnish complete listing for all parts required for models actually furnished.
 - b. Names, addresses and telephone numbers of manufacturers and suppliers.
 - c. Describe and operation of all models actually furnished.
 - d. Furnish all and only pertinent brochures, illustrations, drawings, cuts, bulletins, technical data, certified performance charts and other literature with the model actually furnished to be clearly and conspicuously identified.
 - e. Internal wiring diagrams and engineering data sheets for all items and/or equipment furnished under Contract.
 - f. Guarantee and warranty data.
6. Contractor shall furnish instructions for lubricating each piece of equipment installed by him. Instructions shall state type of lubricant, where and how frequently lubrication is required. Frame instructions under glass and hang in a location as directed by Engineer.

1.25 MANUFACTURER'S REPRESENTATIVE AND COMMISSIONING OF SYSTEMS

- A. Contractor shall provide, at appropriate time or as directed by the Engineer, the on-site services of a competent factory trained Engineer or authorized representative of particular manufacturer of equipment provided under his Contract, such as for the HVAC unit, automatic temperature controls, provided under this Contract, to instruct the Owner, inspect, adjust and place in proper operating condition any item provided by him, as applicable.
- B. The Contractor, as applicable, shall commission and set in operating condition all major equipment and systems, ., in the presence of the applicable equipment manufacturer's representatives, and the Owner and Engineer's representatives. In no case will major systems and equipment be commissioned by any of the Contractor's forces alone, without the assistance or presence of the equipment manufacturers.
- C. A written report shall be issued by the particular equipment manufacturer and the Contractor summarizing the results of

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the commissioning and performance of each system for the Engineer's record. No additional compensation will be allowed for Contractor for such services.

- D. The Contractor shall prepare and submit to the Engineer for acceptance, a schedule of anticipated system commissioning. No system shall be commissioned without prior acceptance of the schedule by the Engineer and Owner. No systems shall be commissioned prior to submittal and acceptance of Operation and Maintenance Manuals.

1.26 CONNECTIONS TO EQUIPMENT

- A. Contractor shall provide all duct and/or pipe connections, condensate traps, drains, power connections, etc., to make equipment operable, as provided under other Sections of the specifications, as shown on the Architectural and/or each Trade's drawings and herein specified, including final connections to equipment to result in a complete system, fully operational. Coordinate location of all equipment with Engineer. Obtain installation diagrams and methods of installation of all equipment from manufacturers. Follow instructions strictly. If additional information is required, obtain same from Engineer. If equipment is indicated on the Architectural drawings, it shall also be construed and understood by the Mechanical Contractor to be constructed as shown on the HVAC drawings and shall be fully serviced and connected at no extra cost to the Owner.

1.27 ELECTRICAL ROOM REQUIREMENTS

- A. The Contractor shall not install any piping, ductwork or equipment in or through electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms, unless piping, ductwork or equipment is intended to serve these rooms. If any Contractor violates this requirement, he shall remove and/or relocate all items as required at his expense and to the satisfaction of the Engineer.

1.28 HOISTING EQUIPMENT AND MACHINERY

- A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work under this Contract shall be furnished, installed, operated and maintained in safe condition by Contractor for his material and/or equipment delivered to the designated hoisting area. All costs for hoisting operating services shall be borne by the Contractor for all equipment and work under his charge.

1.29 STAGING

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- A. All staging, exterior and interior, required to be over 8'-0" in height shall be furnished and erected by Contractor for work under his charge and maintained in safe condition by him for proper execution of his work.

1.30 PHASING DEMOLITION AND MAINTAINING EXISTING SERVICES

- A. During the execution of the work, connections scheduled to be made shall be performed by Contractor as indicated on the drawings, as required by the job conditions in close cooperation with the Engineer and Owner's designated representative to facilitate the installation of the new systems and completion of this Contract. The Owner will require the continuous operation of all existing systems, while demolition, relocation work of new tie-ins are being performed. Outages required for construction purposes shall be scheduled for the shortest practical periods of time, in coordination with the Owner's designated representative for specific, mutually agreeable periods of time after each of which the interruption shall cease and service shall be restored. This procedure shall be repeated to suit the Owner's working schedule as many times as required until all work is completed.
- B. Prior to any deactivation and relocation, capping, valving, tie-in or demolition work, consult the drawings and arrange a conference with the Engineer and the Owner's representative in the field to inspect each of the items to be deactivated, removed or relocated. Care shall be taken to protect all equipment designated to be relocated and reused. Give notice to all parties, with a minimum of (5) working days in advance.
- C. All draining of existing systems, filling and venting required to remove and relocate existing piping systems shall be included and provided under this Contract as required to perform the various equipment or piping relocations or new tie-ins.
- D. Except as otherwise noted, all deactivation, safe capping, valving, etc., of systems designated to be demolished shall be provided by each Trade, as applicable, and all demolition, removal and disposal of demolished materials shall be performed by the GC / CM. All equipment scheduled to be removed shall be inspected by the Owner, and, if he decides that such equipment is to be salvaged, Contractor shall deliver said equipment to an area within the site boundaries as determined by the Owner and Engineer.
- E. The phasing of the work shall be performed in strict accordance with the GC / CM construction schedule. The new systems will be installed and completely commissioned prior

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to occupancy. Coordinate requirements for temporary heat or rerouting of existing services as required to accomplish the construction schedule.

1.31 CONTROL WIRING

- A. The Contractor shall provide all control and interlock wiring for all systems provided under this Contract.
- B. All control wiring shall be installed in conduit and in accordance with the respective equipment manufacturer's requirements, and all connections shall be provided by the Contractor. All conduit and wiring provided by these Contractor shall be installed in accordance with the requirements of Section 26 of the specifications.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 NOT USED

END OF SECTION 230500

SECTION 230514 - VARIABLE FREQUENCY DRIVES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install variable frequency drives (VFD's) for mechanical equipment as scheduled on the drawings and specified herein. The term VFD shall refer to the entire assembly including but not limited to the by-pass.
- B. The VFD's shall comply with the latest applicable standards of ANSI, IEEE, NEMA, NEC, UL and City Test Lab. The controllers shall be rated as indicated. As a minimum, the full load output current of the drive shall be equal to the equivalent motor horsepower as listed by NEC Table 430-150.
- C. Drive horsepower shall be minimum size as indicated. Coordinate size with driven equipment manufacturer.
- D. Provide UL listed, accessory reactors to be UL listed. Bypass panels shall be constructed of UL recognized components assembled in a UL listed enclosure in strict accordance with the NEC for electrical safety. In addition, the assembly shall be UL listed.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:

1. IEEE: Institute of Electrical and Electronic Engineers
2. NEMA: National electrical Manufacture's Association
3. MG 1-78: Motors and Generators
4. NEC: National Electrical Code
5. ANSI: American National Standards Institute
6. UL: Underwriter's Laboratories

1.05 SUBMITTALS

- A. See Section 230500 and General Condition for additional requirements.
- B. Product Data: Provide product description and list of materials, including the following:
 1. Harmonic calculations
 - a. List of all drives.
 - b. Simplified one line diagram indicating linear as well as drives, transformers and PCC.
 - c. Technical description of the program used for the calculations.
 - d. Description of all inputs and outputs from the program.
 2. Complete drawings furnished and approved before proceeding with manufacture. Drawings shall consist of a specific bill of materials, connection diagrams and suitable outline drawings showing details necessary to locate conduit stub-ups and field wiring.
 - a. Details including all labeling.
 - b. Assembled panel short circuit rating and how it will be labeled.
 - c. Heat release of the drive.
 3. Description of field testing.

- a. Proposed schedule of testing indications coordination with occupancy.
- 4. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.06 QUALITY ASSURANCE

- A. Manufacturers must have more than ten (10) years of documents experience in the design, testing and manufacturing of specified or similar products.
- B. Manufacturer must provide written certification that the products provided meet or exceed the specification requirements. An executive officer of the company must sign the written certification.

1.07 WARRANTY

- A. Attention is directed to provisions of the General Conditions and Supplementary General Conditions regarding guarantees and warranties for work under this Contract.
- B. Manufacturers shall provide guarantees for work under this Contract. However, such guarantees shall be in addition to and not in lieu of all other liabilities which the manufacturer and the Contractor may have by Law or by other provisions of the Contract Documents.
- C. All materials, items of equipment and workmanship furnished under each Section shall carry the standard warranty against all defects in material and workmanship. Any fault due to defective or improper material, equipment, workmanship or design which may develop shall be made good, forthwith, by and at the expense of the Contractor including all other damage done to areas, materials and other systems resulting from this failure.
- D. The Contractor shall guarantee that all elements of the systems provided under his Contract, are of sufficient capacity to meet the specified performance requirements as set forth herein or as indicated.
- E. Upon receipt of notice from the Owner's representative of failure of any part of the systems or equipment during the warranty period, the affected part or parts shall be replaced by the Contractor, within three (3) working days, at no cost to the Owner.

- F. The Contractor shall furnish a written guarantee covering the above requirements before the final payment is made.

PART 2 - PRODUCTS

2.01 VARIABLE FREQUENCY DRIVES

A. General

1. Provide a complete variable frequency drive (VFD) (in a single enclosure) of capacity, quantity and characteristics as described in this specification and as shown and scheduled on the drawings. Acceptable manufacturers contingent on compliance with specifications are:
 - a. 25 HP and Less
 - 1) ABB
 - 2) Halmar Robocon Group
 - 3) Square D
 - 4) General Electric
 - 5) Yaskawa
 - 6) Or Approved equal
2. All VFDs (6 & 18 pulse) shall be of the same manufacturer.
3. Each drive and assembly shall be U.L. listed and labeled.
 - a. Label shall include the AIC rating for the assembly which shall not be less than 100,000 AIC. Any unit shipped without such label shall be removed from the job with NO EXCEPTIONS. This also includes six pulse drives with or without bypasses.
4. Each drive shall be mounted with it's accessories in a single cabinet.
5. Installation and start-up services for the equipment shall be covered by this specification.

6. Input control signal shall be compatible with automatic controls and/or building automation control system. Submit written, signed off coordination with submittal.
7. Complete drawings shall be furnished and approved before proceeding with manufacture. Drawings shall consist of a specific bill of materials, connection diagrams and suitable outline drawings showing details necessary to locate conduit stub-ups and field wiring.
8. The VFD shall comply with the latest applicable standards of ANSI, IEEE and NEMA. The controllers shall be rated as shown in the drawings. As a minimum, the full load output current of the drive shall be equal to the equivalent motor horsepower as listed by NEC Table 430-150.
9. Drive horsepowers shall be minimum size as indicated. Coordinate size with driven equipment manufacturer.
10. The VFD manufacturer shall supply with submittal information, harmonic calculations made in accordance with IEEE 519-1992 Standards showing the specified THVD, line notching and the specified THCD limits are met. Calculations shall assume worst case system conditions. System 1-line, 480V transformer data, standby generator data, and primary fault current data required to make these calculations are provided in the system short circuit study and can be obtained from the Electrical Contractor. The submittal shall include, as a minimum, the following information:
 - a. All input data and assumptions.
 - b. Explanation of method used to perform the analysis.
 - c. All calculations and computer printouts used in the analysis, including input documentation.
 - 1) List all drives and accessories.
 - 2) Explanation of all inputs
 - 3) Explanation of all outputs.
 - d. A system impedance diagram based on the Electrical one-line diagrams. It shall be the drive manufactures responsibility to obtain all information required.

- e. All calculations shall be in accordance with IEEE 519 with all drives at 100% speed. The point of common coupling shall be the secondary connection of the transformer supplying that group of devices. These calculations shall be done with the transformer loaded to no more than 70% of its nominal capacity. These calculations shall also be done with all 18-pulse or greater drives running as well as the smaller drives running.
- f. Each point of common coupling shall be defined as the secondary side of the transformer that feeds that group of drives. At the point of common coupling, the following numbers shall meet with the maximum load on the transformer no greater than 70% of its nominal capacity.
 - 1) Total harmonic voltage distortion is less than 3%
 - 2) Total harmonic current distortion is less than 5% and harmonic table requirements $I_{SC} / I_L < 20$
- g. A detailed description of the tests, procedures and supporting calculations required to substantiate the installed systems compliance with the specified THD limits.
 - 1) The description shall include information on the proposed test equipment and test conditions.
 - 2) Include the name and qualifications of the firm which will conduct the field tests.
- h. Submittals without calculations will not be reviewed.
- 11. Drives shall be capable of the full rated motor horsepower at all carrier frequencies of that drive.

B. Construction

- 1. VFDs 30 HP and Larger
 - a. VFDs 30 HP and larger shall be 18-pulse (or greater) input. Provide data and calculations showing the drive harmonics do not exceed the following numbers at the power connection to the drive.

- 1) Total harmonic voltage distortion: Less than 3%
- 2) Total harmonic current distortion: Less than 5% and harmonic table requirements for $I_{SC}/I_L < 20$.

Note: These are the maximum harmonics that can be generated by each of these drives.

b. The use of the following devices is permitted:

- 1) A.C. Line reactors
- 2) DC chokes
- 3) KMP Transformers
- 4) KMP + XFMR Filter Transformers

c. The use of the following devices is not permitted:

- 1) Passive filters.
- 2) Broad band filters.

2. VFDs 25 HP and Less

a. VFDs 25 HP and less shall be 6-pulse (or greater) input. Provide data and calculations showing the drive harmonics.

b. 5% line reactors shall be provided on each drive as a minimum.

c. The use of the following devices is not permitted:

- 1) Passive filters.
- 2) Broad band filters.

d. The use of the following devices is permitted:

- 1) Changing additional drives to 18 pulse or greater.

3. Harmonic Table

I _{SC} / I _L	Harmonic Order (Odd Harmonics)					THD
	H<11	11<h17	17<h23	23<h35	35<h	
<20	4.0	2.0	1.5	0.6	0.3	5.0
20-50	7.0	3.5	2.5	1.0	0.5	8.0
50-100	10.0	4.5	4.0	1.5	0.7	12.0
100-1000	12.0	5.5	5.0	2.0	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0

4. 18 Pulse Transformer

a. Auto transformer

- 1) Voltage 480.
- 2) Input variation less than 3%.
- 3) Insulation Class 220°C
- 4) Temperature rise 150°C
- 5) With 7.5% AC input line reactors for proper current balance.
- 6) Output Voltage unbalance less than 2% for each bridge
- 7) Output current shall be 1/3 of rated input

b. Isolation Transformer.

- 1) Voltage 480.
- 2) Input variation less than 3%.
- 3) Output Voltage unbalance less than 2% for each bridge
- 4) Output current shall be 1/3 of rated input

5. All Drives

- a. The VFD shall be of the pulse width modulated (PWM) design converting the fixed utility voltage and frequency to a variable voltage and frequency output via a 2-step operation. VFDs utilizing a 3rd power section are not acceptable. Efficiency shall exceed 96% at 100% speed and load. Line

side displacement power factor shall exceed (0.95) regardless of speed and load. The VFD shall be rated for 110% current for (1) minute for variable torque loads and 150% current for (1) minute for constant torque loads.

- b. VFD's located indoors shall be housed in a signal NEMA 1 metal enclosure (including 18-pulse transformer, filters, line reactor, and other required accessories).
- c. Drives located outside shall be provided with a single NEMA 3R enclosure and an independent heating and cooling system to maintain manufacturer's ambient operating conditions.
- d. Drives located other than outside (submit list of all drives individually indicating):
 - 1) Space drive is located.
 - 2) Space ventilation is adequate, space air conditioning is adequate or the size of the cooling provided in the drive.
 - 3) Space heating is adequate or the size of the heater provided in the drive.
- e. Standard operating conditions shall be:
 - 1) Incoming 3-phase 480 VAC power, +5% or - 10%, 60 Hz.
 - 2) Humidity 0 to 95% (non-condensing and non-corrosive).
 - 3) Altitude 0'-0" to 3,300'-0" above sea level.
 - 4) Ambient temperature 0° to 40°C.
- f. VFDs shall include the following system interfaces:
 - 1) Speed reference interface with a differential amplifier or isolated input 0-10 VDC or 4-20 mADC signal.
 - 2) Run relay with an isolated set of Form C contacts.

- 3) Minimum of 2 programmable contacts.
 - 4) Trip contacts (Form C).
 - 5) VFD will accept an external trip contact and indicate so on the display.
 - 6) Dedicated terminal blocks for interface with maintained remote start contacts.
 - 7) Output signal proportional to output frequency (0-10 VDC or 4-20 mA DC).
 - 8) Output signal proportional to output current (0-10 VDC or 4-20 mA DC).
 - 9) Provided with communications chip to provide complete interface with the ATC control and automation system.
- g. The VFD shall include the following protective features:
- 1) Lockable Fused disconnect (or breaker) rated for 100,000 AIC.
 - 2) Electronic instantaneous overcurrent protection.
 - 3) DC bus undervoltage protection.
 - 4) DC bus overvoltage protection.
 - 5) Ability to withstand output line-to-line short circuits without component failure.
 - 6) Status indication via an LED display of the following protective functions:
 - a) DC Bus Undervoltage
 - b) Overcurrent
 - c) DC Bus Overvoltage
 - d) Controller Overtemperature
 - e) Overload
 - f) Overload Warning

- g) Overfrequency and Phase Loss
- h) A single light to indicate a VFD trip is not acceptable.
- 7) Overload capability shall be 110% of the inverter rating for (1) minute.
- 8) Selectable auto restart.
- 9) VFD will catch a motor spinning in the forward or reverse direction upon starting.
- 10) Upon loss of the input signal (4-20 mA), the drive will stop or go to preset speed.
- h. Standard adjustments shall include:
 - 1) Minimum frequency (4-60 Hz)
 - 2) Maximum frequency (40-120 Hz)
 - 3) Minimum of three (3) preset speeds (4-120 Hz) initiated by contact closures
 - 4) Minimum of three (3) acceleration times (2-300 seconds)
 - 5) Minimum of three (3) deceleration times (2-300 seconds)
 - 6) Minimum speed dwell time (0-18 seconds)
 - 7) Voltage boost (0-40V) for starting torque control
 - 8) Adjustable Carrier frequency 700-8,000 Hz for motor noise reduction or flexible switching technology. This adjustment shall be without derating the drive or motor.
 - 9) Current limit (70-120%)
 - 10) Critical frequency avoidance ([2] bands with 10 Hz adjustable widths)
- i. Door mounted operator controls and status indication from the LED display shall include:

- 1) Run/stop selection and LED indication (keypad or remote)
 - 2) Speed control selection and LED indication
 - 3) Forward/Reverse selection
 - 4) Manual speed adjustment
 - 5) Frequency meter
 - 6) Motor RPM
 - 7) Ammeter
 - 8) Output voltage
 - 9) Elapsed time meter
- j. The keypad shall have an LED display. The reverse button and the programming functions may be locked out if desired.
6. The following list of options shall be included:
- a. Input lockable disconnect rated 100,000 AIC.
 - b. Thermal motor overcurrent relay.
 - c. Bypass which includes an output contactor electrically and mechanically interlocked with a bypass contactor, run relay including control logic, status lights and a thermal motor overcurrent relay. The complete bypass system and Inverter/Off/Bypass selector switch shall be packaged in a single VFD enclosure. The bypass shall include a starter.
 - d. Electronics shall allow VFD to follow discrete increase speed and discrete decrease speed contact closures from a photohelic or similar device.
 - e. 120V control transformer and circuitry.
 - f. Output line reactors or output filters when the drive location and the motor are more than 100 feet apart.

- g. Interior heaters shall be provided to maintain the minimum drive temperature when the drive is off.
- h. A Customer Interlock Terminal Strip - provide a separate terminal strip for connection of fire, smoke, freeze contacts and external start command. All external interlocks and start/stop contacts shall function with drive in hand, auto or bypass.
 - 1) Damper control circuit shall be operable in the hand, auto and bypass.

7. Service

- a. The VFD manufacturer shall provide a start-up service package for all VFDs provided. Service shall include inspector for final adjustment, operational checks, and a final report for record purposes. The service package shall include a (1) year parts and labor warranty and 2 year parts warranty each from date of written acceptance and be performed by local factory trained service engineers. The service center must be permanently located within (200) miles of the job site and able to provide 24-hour service.

8. Protection

- a. The VFD shall be protected against damage at all times. The drive shall be stored in a clean, dry environment with temperature and humidity within the range as specified by the drive manufacturer. Space heaters shall be energized controlled storage as recommended by the manufacturer. Storage space shall be environmentally controlled.

9. Factory Tests and Checks

- a. VFD power semiconductors and diodes shall be 100% inspected and tested, including load testing.
- b. Small signal semiconductors, resistors, capacitors and diodes shall be lot sampled. Testing shall include parameter, as well as functional characteristics.
- c. All printed circuit boards shall be tested under a temperature cycling (0°C to +65°C) 24-hour load

test and then functionally tested via fault finder bench equipment prior to unit installation.

- d. All final assemblies shall be tested at full load with application of line-to-line and line-to-ground bolted faults. The VFD shall trip electronically without device failure.
- e. After all tests have been performed, each VFD shall undergo a 24-hour burn-in test. The drive shall be burned-in at 100% inductive or motor load for (24) hours without an unscheduled shutdown.

- 10. A (1) day training course for Owner's personnel shall be presented by representatives of the manufacturer at the jobsite.

PART 3 - EXECUTION

3.01 VFD INSTALLATION

- A. Install in accordance with manufacturer recommendations, Contract Drawings, and reviewed submittals.
- B. Install to meet the Local and State Electrical Code and so as to ensure easy accessibility for service, removal, or replacement of all components.
- C. Provide supplemental steel, support, rods and hangers necessary to hang or mount VFDs.
- D. Receive and inspect VFDs to ensure they are without defect. Defective or damaged VFDs shall be returned to the manufacturer.
- E. Protect equipment to prevent damage from water, dirt, or accident. Protection shall include, but not be limited to, temporary plastic wrap to maintain equipment in original factory condition.
- F. Wiring installation and handling shall be in accordance with manufacturer's recommendations.
- G. Provide field testing (as described in Paragraph F, of this above Section).

- H. All VFDs shall be installed inside indoor inside mechanical rooms or as directed by owner, whether the VFD locations are specifically shown on contract drawings or otherwise.
- I. All VFDs shall be provided with 42" clear space in front of the unit and shall be mounted on structural mounts.

3.02 FIELD TESTS AND CHECKS

- A. Testing, checkout and start-up of the VFD equipment shall be performed under the technical direction of the manufacturer's service engineer. Under no circumstances are any portions of the drive system to be energized without authorization from the manufacturer's representative.
- B. The Contractor shall provide independent harmonic testing by an independent testing company. Provide readings with printouts of the harmonic current at each harmonic as well as the total voltage distortion. The following readings shall be provided:
 - 1. At each point of common coupling:
 - a. With all drives running with load
 - b. With all drives off
 - 2. At the power connection to each drive:
 - a. With the drive running loaded
 - b. With drive off
 - 3. All the above data shall be submitted to the Architect for review. If these tests shown that the drives are not in compliance with the Specifications, the drive manufacturer shall make all changes required to comply with the Specifications at no cost to the Owner. If required, this could mean replacing the drives that are not in compliance.
 - 4. A copy of all tests and checks performed in the field, complete with meter readings and recordings, where applicable, shall be submitted to the Owner for this record.

END OF SECTION 230514

SECTION 230529 - HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all hangers, supports and assemblies for all parts of the mechanical systems. This shall include all ducts and equipment specified in this Division and as shown on the drawings
- B. All materials shall be new and manufactured for the specific purpose of supporting systems, equipment, ducts, conduits and accessories.
- C. All system components shall be installed in accordance with local codes as required and specified under Section 230540.
- D. Secure all permits and local/state approval for the components as specified and included under this Section.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- B. Refer to Section 230540 - Mechanical Vibration Controls a for specified information related to and affecting this section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
 - 1. Material standards shall be as specified or detailed hereinafter and as following:
 - 2. ASME B31.9 - Building Services Piping, The American Society of Mechanical Engineers.

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3. ASME B31.1 - power piping.
4. ASHRAE Systems and Equipment Handbook.
5. ASTM F 708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
6. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry.
7. MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve Fittings Industry.
8. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry.
9. NFPA-13 - Installation of Sprinkler Systems
10. MSS-SP-127-2001 - Bracing for Piping Systems.

1.05 SYSTEM DESCRIPTION

- A. In addition to special hangers and supports specified elsewhere in this Section and shown on the drawings for ducts and equipment, furnish and install safe and substantial means of support for all parts of the mechanical systems. Shop drawings shall be submitted for review and approval for all supports. All ductwork, shall be installed with vibration isolators. This requirement is mandatory and shall be strictly enforced.
- B. The hanging and supporting of equipment shall conform to recommendations of the manufacturers of same and American National Standard, ANSI/MSS SP-58 and SP-69 latest edition, except where requirements of this specification exceed the above referenced Standards.

1.06 SUBMITTALS

- A. See Section 230500 and General Conditions for Additional Requirements.
- B. All brackets and hangers shall be submitted for review. Include the method of hanging and supporting all ductwork and equipment.

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- C. The Architect is to be notified when the first bracket is assembled so that the installation can be reviewed in the field.
- D. Provide location of all inserts to be used for hanging ductwork and equipment and the weight of all components (including water weight).

1.07 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products of the type specified in Part 2 - Products.
- B. Installer: Company specializing in performing work of the type specified in this section, with documented experience.
- C. Welders: Certify in accordance with ASME.

1.08 REGULATORY REQUIREMENTS

- A. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations
 - 1. Provide certificate of compliance from authority having jurisdiction, indicating approval of welders.

1.09 DELIVERY, STORAGE AND HANDLING

- A. All hangers and supports shall be delivered in containers and shall be kept in a dry and protected area.
- B. All exposed hangers, supports, etc. shall be given 2 coats of rust resistant paint of a color selected by the Architect prior to installation.

1.10 ENVIRONMENTAL

- A. Do not paint or install inserts, hangers and/or supports when environmental conditions are outside the specific limitations of the referenced codes and manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 DUCT HANGERS

- A. See Specification 233100 Sheet Metal.

2.02 MISCELLANEOUS MATERIALS

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- A. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
- B. Structural Steel: ASTM A 36M, steel plates, shapes, and bars, black and galvanized.
- C. Grout: ASTM C 1107, Grade B, factory-mixed and packaged, nonshrink and nonmetallic, dry, hydraulic-cement grout.
 - 1. Characteristics: Post hardening and volume adjusting recommended for both interior and exterior applications.
 - 2. Properties: Nonstaining, noncorrosive and nongaseous
 - 3. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.01 PREPARATION

- A. All hangers, rod and supports shall receive two (2) coats of rust inhibitive paint.
- B. Provide inserts for placement in concrete formwork.
- C. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

3.02 INSTALLATION

3.03 INSERTS

- A. Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- B. Finish inserts, flush with slab surface.
- C. Inserts: Steel, slotted type, factory-painted.
 - 1. Single rod: Similar to Grinnell Figure 281.
 - 2. Multi-rod: Similar to Carpenter and Paterson 1480 Type 1.

3. Clip form nails flush with inserts.

4. Maximum load 75 percent of rating.

3.04 SUPPORTS FROM BUILDING CONSTRUCTION

A. Inserts, Beam Clamps, Steel Fishplates (in concrete fill only), Cantilever Brackets or Other Means.

B. Submit for Review.

C. Grouped Lines and Services

1. Trapeze Hangers fabricated of Bolted Angles or Channels.

D. Where Building Construction is Inadequate

1. Provide Additional Framing.

2. Submit for Review.

3.05 EXPANSION DEVICES

A. Expansion anchors: Similar to Hilti "Drop-In Anchor HDI" flush type.

B. Drill concrete to receive required expansion cases on concrete fasteners.

C. Install in shear only, not in tension.

3.06 EQUIPMENT BASES AND SUPPORTS

A. Provide rigid anchors for ducts immediately after vibration connections to equipment.

B. Refer to Specification Section 15001 for additional information.

C. Fabricate structural-steel stands to suspend equipment from structure above or to support equipment above floor.

D. Grouting: Place grout under supports for equipment and make smooth bearing surface.

3.07 METAL FABRICATION

A. Cut, drill, and fit miscellaneous metal fabrications for heavy-duty steel trapezes and equipment supports.

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- B. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding appearance and quality of welds, and methods used in correcting welding work, and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base-metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.08 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 230529

SECTION 230548 - MECHANICAL VIBRATION CONTROLS AND SEISMIC RESTRAINTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all necessary vibration isolation materials to eliminate excessive noise and vibration from all building mechanical systems.
- B. All systems shall be installed in accordance with IBC 2000, use group III, seismic design category D and local codes including requirements for seismic restraints and hold downs.
- C. Secure all permits and local/state approval for the installation of all components included under this Section.
- D. The work in this Section shall include the following:
 - 1. Vibration isolation elements for equipment.
 - 2. Equipment isolation bases.
 - 3. Piping flexible connectors.
 - 4. Seismic restraints for isolated equipment.
 - 5. Seismic restraints for non-isolated equipment.
 - 6. Certification of seismic restraint designs and installation supervision.
 - 7. Certification of seismic attachment of housekeeping pads.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

- B. Material standards shall be as specified or detailed hereinafter and as follows:
1. NEBB- Procedural Standards for Measuring Sound and Vibration; National Environmental Balancing Bureau.
 2. NEBB- Sound and Vibration in Environmental Systems; National Environmental Balancing Bureau.
 3. SMACNA - Guidelines for Seismic Restraint of Mechanical Systems.
 4. ASHRAE Guidelines - HVAC Applications; Chapter- Sound and Vibration Control, Chapter - Seismic Restraint Design, Latest Edition.

1.05 SUBMITTALS

- A. See Section 230500 and General Conditions for additional requirements.
- B. The Vibration Isolation Submittal shall include descriptive data for all products and materials including the following:
1. Product Descriptions
 - a. A complete description of products to be supplied, including product data, dimensions, specifications and installation instructions.
 - b. An itemized list of isolated and non-isolated equipment. Detailed schedule and selection data for each vibration isolator and seismic restraint supporting equipment, including:
 - 1) Equipment identification mark
 - 2) Isolator type
 - 3) Actual load
 - 4) Static deflection expected under actual load
 - 5) Specified minimum static deflection
 - 6) Additional deflection-to-solid under load
 - 7) Ratio of spring height under load to spring diameter
 - 8) Base type
 - 9) Seismic restraint type
 - c. Steel rails, steel base frames, and concrete inertia bases showing all steel work, reinforcing, vibration isolator mounting attachment method, and location of equipment attachment bolts.

2. Show equipment base construction for all equipment, including dimensions, structural member sizes and support point locations.
 3. Indicate isolation devices selected with complete dimensional and deflection data.
 4. Show all methods of suspension and support for ceiling hung equipment.
 5. Detail methods of isolation for ducts and pipes piercing walls and slabs.
 6. Provide specific details of seismic restraints and anchors, including number, size and locations for each piece of equipment.
 7. Provide special details necessary to convey complete understanding of the work to be performed.
- C. Seismic Analysis and Certification submittals shall include the following:
1. Seismic restraint calculations must be provided for all connections of equipment to the structure.
 2. Calculations to support seismic restraint designs shall be stamped by a registered Professional Engineer.
 3. Analysis must indicate calculated dead loads, derived loads, and materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and weld length.
 4. A seismic design liability insurance certificate must accompany all submittals.
 5. Coordinate all hangers and supports.
 6. Provide Approved Agencies Certificate of Compliance meeting Seismic Category D for all components. Tests shall include anchorage, structural and on line capability from analytical or shaker test method.
 - a. Where the requirements of this specification cannot be met by any vendor, the contractor will submit a written summary indicating the lack of resources.

- D. Submission of samples may be requested for each type of vibration isolation and seismic device. After approval, samples will be returned for installation at the job if requested. All costs associated with submission of samples shall be borne by the Contractor.

1.06 QUALITY ASSURANCE

- A. All vibration isolators shall have calibration markings or some method to determine the actual deflection under the imposed load after installation and adjustment.
- B. All isolators shall operate within the linear portion of their load versus deflection curves. Load versus deflection curves shall be furnished by the manufacturer and must be linear over a deflection range of at least 50% above the design deflection.
- C. The theoretical vertical natural frequency for each support point, based upon load per isolator and isolator stiffness, shall not differ from the design objectives for the equipment as a whole by more than $\pm 10\%$, and shall be non-resonant with equipment forcing frequencies or support structure natural frequencies.
- D. All neoprene components shall have a shore hardness of 30 to 50 $\pm 5\%$, after minimum aging of (20) days or equal oven aging.
- E. Substitution of internally isolated and restrained equipment in lieu of the isolation and restraints specified in this Section is acceptable provided all conditions of this Section are met. The equipment manufacturer shall provide a letter of guarantee stating that the specified noise and vibration levels will be obtained and that the seismic restraints shall be in compliance with these specifications. All costs for converting to the specified external vibration isolation and/or restraints shall be borne by the equipment manufacturer/installing contractor should submissions or installations be found to be unacceptable pursuant to the intent of this specifications.
- F. Should any rotating equipment cause excessive noise or vibration, the Contractor shall be responsible for rebalancing, realignment, or other remedial work required to reduce noise and vibration levels. Excessive is defined as exceeding the manufacturer's specifications for the unit in question.
- G. Upon completion of the work, the Architect or Architect's representative shall inspect the installation and shall

inform the Installing Contractor of any further work that must be completed. Make all adjustments as directed by the Architect that result from the final inspection. This work shall be done before vibration isolation systems are accepted.

H. Manufacturer Responsibility

1. Manufacturer of vibration and seismic control equipment shall have the following responsibilities:
 - a. Determine vibration isolation and seismic restraint sizes and locations.
 - b. Provide equipment vibration isolation and seismic restraints as scheduled or specified.
 - c. Guarantee specified isolation system deflections.
 - d. Provide installation instructions, drawings and field supervision to ensure proper installation and performance of systems.
 - e. Provide certification by a licensed engineer that all mounts and restraints meet the project requirements for seismic loading.
2. Substitution of internally isolated mechanical equipment in lieu of the specified isolation of this Section must be approved for individual equipment units and is acceptable only if above acceleration loads are certified in writing by the equipment manufacturer and stamped and sealed by a licensed Civil or Structural Engineer.
3. Licensed Engineers shall be licensed in the project state.

I. Contractor Responsibilities

1. The Contractor performing the work on equipment in the section shall have the following responsibilities.
 - a. Identify the components that are part of the Quality Assurance Plan.
 - 1) All flammable, combustible and highly toxic piping and their associated mechanical systems.
 - 2) All ductwork containing hazardous materials.

- 3) All equipment using combustible or toxic energy sources.
- b. Identify all Special inspection and Testing.
 - c. List control procedures within the contractor's organization including methods and frequency of reporting and their distribution.
 - d. List personnel and their qualifications exercising control over the seismic aspects of the project.
2. Purchased and/or fabricated equipment must be designed to safely accept external forces of 1.8 g load in any direction for all rigidly supported equipment, piping and ductwork without failure and permanent displacement of the equipment. Resiliently supported equipment, piping and ductwork and Life safety equipment such as fire pumps, smoke exhaust fans, emergency generators and other life safety designated equipment must be capable of accepting external forces of up to 3.6 g in any direction without permanent displacement or failure of the equipment.

1.07 REGULATORY REQUIREMENTS

- A. Conform to ASME B31.9 code for installation of piping system and ASTM F708 for design and installation of pipe hangers.
- B. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.
- C. Provide certificate of compliance from authority having jurisdiction, indicating approval of welders.

1.08 DELIVERY, STORAGE AND HANDLING

- A. All vibration control and SEISMIC restraint equipment shall be delivered in containers and shall be kept in a dry and protected area.
- B. All exposed hangers, supports, etc. shall be given 2 coats of rust resistant paint of a color selected by the Architect prior to installation.

PART 2 - PRODUCTS

2.01 ISOLATORS AND RESTRAINTS - GENERAL

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- A. Acceptable Manufacturers subject to compliance to specifications.
1. Mason Industries (MI)
 2. Amber/Booth (AB)
 3. Kinetics Noise Control (KNC)
 4. Vibration Eliminator Co. (VEC)
 5. Vibration Mountings & Controls (VMC)
- B. The Mechanical Contractor shall provide necessary vibration isolation materials to eliminate excessive noise and vibration from being transmitted from HVAC equipment to the occupied areas of the structure, and to serve as the basis for seismic restraint design for the entire HVAC system within the building. This includes all non-structural components such as, but not limited to, air handlers, fans, pumps, tanks, ductwork, piping, etc. (hereinafter called equipment).
- C. Seismic restraints and vibration isolation types shall be capable of accepting, without failure, seismic forces determined in accordance with:
1. International Building Code 2000
 2. State/Country Codes
 3. Local codes enforced at the specified project location.
- D. Isolators and supports shall maintain the equipment in a captive position and not short circuit isolation during normal operating conditions. Isolators shall have provisions for bolting and/or welding to the structure.
- E. All metal parts of vibration isolation units installed out-of-doors shall be cold dip galvanized, cadmium plated, or neoprene or PVC coated after fabrication. Galvanizing shall meet ASTM Salt Spray Test Standards and Federal Test Standard #14.
- F. All base supported isolators shall have base plates with bolt holes for fastening the isolators to the support members.
- G. Isolator types are scheduled to establish minimum standards. At the Contractor's option, laborsaving accessories can be an integral part of isolators supplied to provide initial lift of equipment to operating height, hold piping at fixed elevations during installation and initial system filling operations, and similar installation

advantages. Accessories must not degrade the vibration isolation system.

- H. Static deflection of isolators shall be as scheduled in this Section and as shown on the drawings. All static deflections stated are the minimum acceptable deflection under actual load. Isolators shall be selected for no less than 50% reserve deflection beyond actual operating conditions.
- I. Attachment plates to be cast into housekeeping pads, concrete inserts, beam clamps, etc. that may be required for seismic compliance shall be provided by this Section.
- J. Coordinate the size, location and special requirements of vibration isolation equipment and systems with other Trades. Coordinate plan dimensions with size of housekeeping pads.

2.02 SEISMIC RESTRAINT TYPES

A. Type I

- 1. Type I shall comply with general characteristics of spring isolator Type A with snubbing restraint in all directions capable of supporting equipment at fixed elevations during installation. Cast or aluminum housings, except ductile iron are not acceptable.
- 2. Type I seismic restraint shall be similar to Mason Industries Type SLRS.

B. Type II

- 1. Each corner or side of equipment base shall incorporate a seismic restraint snubber having a minimum of 5/8" thick resilient pad limit stop. Seismic snubbers shall be in accordance with manufacturer's recommendations.
- 2. Type II seismic restraints shall be similar to Mason Industries Type Z-1011 or Z-1225.

C. Type III

- 1. Type III shall be multiple metal cable or strut type with approved fastening devices to equipment and structure. System to be field bolted to deck or to overhead structural members using 2-sided beam clamps or appropriately designed inserts for concrete. All parts of the system including cables, excluding

fasteners, are to be of a single supplier to ensure seismic compliance.

D. Type IV

1. Type IV shall have double deflection neoprene isolator (minimum 0.3") encased in ductile iron or steel casing.
2. Type IV seismic restraints shall be similar to Mason Industries Type BR, RBA or RCA.

E. Type V

1. Non-isolated equipment shall be field bolted or welded (powder shots not acceptable) to the structure as required to meet seismic forces. Bolt diameter, imbedment data and/or weld length must be shown in certified calculations.

2.03 VIBRATION ISOLATOR TYPES

A. Type A (Floor Spring and Neoprene)

1. The Type A spring isolator shall:
 - a. Have a minimum outside diameter to overall height of 0.8:1.
 - b. Have corrosion resistance where exposed to corrosive environment with:
 - 1) Springs cadmium plated or electro-galvanized.
 - 2) Hardware cadmium plated.
 - 3) All other metal parts hot dip galvanized.
 - c. Have reserve deflection (from loaded to solid height) of 50% of rated deflection.
 - d. Have minimum 1/4" thick neoprene acoustical base pad on underside, unless designed otherwise.
 - e. Be designed and installed so that ends of springs remain parallel.
2. Type A isolator shall be similar to Mason Industries Type SLF.

Note: Must be used with Seismic Restraint II.

B. Type B (Floor Spring and Neoprene Travel Limited)

1. The Type B spring isolator shall be the same as Type A with the following additional features.
 - a. Built-in vertical limit stops with minimum 1/4" clearance under normal operation.
 - b. Tapped holes in top plate for bolting to equipment.
 - c. Capable of supporting equipment at fixed elevation during equipment installation. Installed and operating heights shall be identical.
 - d. Adjustable and removable spring pack with separate neoprene isolation pad.
2. Type B isolator shall be similar to Mason Industries Type SLR.

Note: This isolator must be bolted or welded to the structure.

C. Type C (Spring Hanger Rod Isolator)

1. Spring isolator (Type A) seated on a steel washer within a neoprene cup incorporating a rod isolation bushing.
2. Spring diameters and hanger box shall allow 30° of hanger rod movement.
3. When used on ductwork, provide eyebolts for attachment to duct straps.
4. Type C isolator shall be similar to Mason Industries Type 30 or W30.

Note: Must be used with Seismic Restraint III.

D. Type D

1. Same as Seismic Restraint Type IV.

E. Type E (Elastomer Hanger Rod Isolator)

1. Molded (minimum 1 3/4" thick) neoprene element with projecting bushing lining the rod clearance hole.

Static deflection at rated load shall be minimum 0.035".

2. Steel retainer box encasing neoprene mounting capable of supporting equipment up to (4) times the rated capacity of the element.
3. Type E isolator shall be similar to Mason Industries Type HD.

Note: Must be used with Seismic Restraint III.

F. Type F (Combination Spring/Elastomer Hanger Rod Isolator)

1. Spring and neoprene elements in a steel retainer box with the features as described for Type C and Type E isolators.
2. Type F isolator shall be similar to Mason Industries Type 30N.

Note: Must be used with Seismic Restraint III.

G. Type G (Pad Type Elastomer Isolator)

1. 0.75" minimum thickness, 50 psi maximum loading, ribbed or waffled design.
2. Minimum 0.1" deflection.
3. 1/16" galvanized steel plate between multiple pad layers.
4. Provide load distribution plate where attachment to equipment bearing surface is less than 75% of the pad area.
5. Type G isolators shall be similar to Mason Industries Type Super W.

Note: Bolting required for seismic compliance. Neoprene and duck washers and bushings shall be provided to prevent short circuiting.

H. Type H (Pad Type Elastomer Isolator)

1. Laminated canvas duck and neoprene, maximum loading 1000 psi, minimum 1/2" thick.

2. Provide load distribution plate where attachment to equipment bearing surface is less than 75% of the pad area.
3. Type H isolator shall be similar to Mason Industries Type HL.

Note: Bolting required for seismic compliance. Neoprene and duck washers and bushings shall be provided to prevent short circuiting.

I. Type I (Thrust Restraints)

1. A spring element similar to Type A isolator shall be combined with steel angles, back-up plates, threaded rod, washers and nuts to produce a pair of devices capable of limiting movement of air handling equipment to 1/4".
2. Restraint shall be easily converted in the field from a compression type to tension type.
3. Unit shall be factory precompressed.
4. Thrust restraints shall be installed on all cabinet fan heads, axial or centrifugal fans whose thrust exceeds 10% of unit weight.
5. Type I restraint shall be similar to Mason Industries Type WB.

J. Type J (Steel Rails)

1. Steel members of sufficient strength to prevent equipment flexure during operation.
2. Height saving brackets as required to reduce operating height.
3. Type J isolator shall be similar to Mason Industries Type ICS.

K. Type K (Pipe Anchors and Guides)

1. Acoustical pipe anchor or guide, consisting of a telescopic arrangement of (2) sizes of steel tubing separated by a minimum 1/2" thickness of Type H pad.
2. Vertical restraints shall be provided by a similar material arranged to prevent vertical travel in either direction (anchors only).

3. Allowable loads on isolation materials shall not exceed 500 psi, and the design shall be balanced for equal resistance in any direction.
 4. Anchors and guides must be bolted or welded to meet seismic criteria.
 5. Type K anchor shall be similar to Mason Industries Type ADA.
- L. Type L (Isolated Clevis Hanger)
1. Combination clevis or rod roller hanger and a Type C, E, or F, isolation hanger.
 2. System shall be precompressed to allow for rod insertion and standard leveling.
 3. Type L hanger shall include Mason Industries Type CCB clevis brace.

2.04 EQUIPMENT BASES

- A. All curbs and roof rails are to be bolted or welded to the building steel or concrete deck to attain acceleration criteria and shall be wind restrained for 110 mph wind loads.
- B. Type B-1 (Integral Structural Steel Base)
1. The integral structural steel base shall be reinforced as required to prevent base flexure at equipment start-up and misalignment of driver and driven units. Centrifugal fan bases shall be complete with motor slide rails and shall be drilled for driver and driven units.
 2. Height saving brackets shall be provided, as required, to reduce operating height and maintain 1" operating clearance under base.
 3. Member depth shall be a minimum of 1/10 of the longest unsupported span.
 4. Type B-1 equipment base shall be similar to Mason Industries Type M or WF.
- Note:** Must be used with Restraint I, II or IV.
- C. Type B-2 (Concrete Inertia Base)

1. Concrete inertia base shall have rectangular structural concrete forms for floating foundations. Base for split-case pumps shall be large enough to support elbows. The base depth shall be a minimum of 1/12 the longest span, but not less than 6" or greater than 14". Forms shall include concrete reinforcement consisting of 1/2" bars or angles welded in place on 6" centers both ways in a layer 1 1/2" above the bottom. Provide an additional top layer of reinforcing for all bases exceeding 10'-0" in one direction.
2. Isolators shall be set into pocket housings which are an integral part of the base construction and set at the proper height to maintain 1" clearance below the base. Base shall be furnished with templates for equipment attachment and anchor bolt sleeves.
3. Type B-2 equipment base shall be similar to Mason Industries Type K or KIPWF.

Note: Must be used with Restraint I, II or IV.

D. Type B-3 (Spring Roof Curb)

1. Curb mounted rooftop equipment shall be mounted on structural spring isolation curbs that bear directly on the roof support structure, and are flashed and waterproofed into the roof's membrane waterproofing system. Equipment manufacturer's curb shall not be used.
2. All spring locations shall have removable waterproof covers to allow for spring adjustment and/or removal. Springs shall be Type A.
3. Curbs shall be thermal and sound attenuating type utilizing standard 2" roof insulation supplied and installed by the Roofing Contractor.
4. Unit shall be provided with wood nailer and flashing.
5. Curbs shall meet all NRCA Standards.
6. Curbs shall include a means of incorporating a sound barrier package, Type SBC-3 consisting of (2) layers of waterproof sheetrock furnished and installed by others.
7. Curbs installed on pitched roofs shall be factory built to compensate for elevation changes.

8. Curbs shall be similar to Mason Industries Type RSC having a minimum 3" rated static deflection.

E. Type B-4 (Flashable Roof Rail System)

1. Rooftop fans, condensing units, air handlers, etc. shall be mounted on continuous support piers that combines equipment support and isolation into (1) assembly.
2. Rails shall incorporate Type A isolators which are adjustable, removable and interchangeable after equipment has been installed.
3. The system shall maintain the same installed and operating height with or without the equipment load.
4. The system shall have full plywood nailers on all (4) sides, designed to accept membrane waterproofing and shall be dry galvanized or plastic coated.
5. Unit to be supplied with flashing.
6. Roof rail shall be similar to Mason Industries Type R-7000 having a minimum 3" rated static deflection.

F. Type B-5 (Roof Rail Base)

1. Rails shall be constructed from structural steel angles sized as required to prevent flexure and misalignment under load.
2. Each rail shall be the full length of the supported equipment and be welded to a series of Type B isolators. Bolt-on angle cross ties at the ends and center shall form (1) rigid platform.
3. Roof rail shall be similar to Mason Industries Type TRSLR.

G. Type B-6 (Non-Isolated Roof Curb)

1. Non-isolated, curb mounted rooftop equipment shall be mounted on structural curbs that meet the acceleration criteria hereinbefore defined.
2. Curbs shall accept standard 2" roof insulation furnished and installed by the Roofing Contractor.
3. Non-isolated curbs shall be similar to Mason Industries Type RRC.

2.05 FLEXIBLE PIPE CONNECTOR

- A. All flexible connectors shall be installed on the equipment side of the shutoff valves, horizontal and parallel to equipment shafts whenever possible. All piping between the flexible connector and the equipment shall be independently supported off the equipment base.
- B. Type FC-1 (Elastomer Connector)
1. Manufactured of nylon tire cord and EPDM, both molded and cured in hydraulic presses. Neoprene used in lieu of EPDM is not acceptable.
 2. Straight connectors to have (2) spheres reinforced with a molded in external ductile iron ring between the spheres.
 3. Rated at 250 psig/170°F, dropping in a straight line to 170 psig/250°F for sizes 1 1/2" to 12".
 4. All sizes shall employ control cables with neoprene end fittings isolated from anchor plates by means of 1/2" bridge bearing neoprene bushings.
 5. Connectors shall be installed pre-extended per manufacturer's recommendations to prevent elongation under pressure.
 6. Minimum safety factor of 3.6:1 at maximum pressure ratings shall be certified by test reports. Submittals shall also include (2) test reports by independent consultants showing minimum reduction of 20 dB in vibration accelerations and 10 dB in sound pressure levels at typical blade passage frequencies.
 7. Connectors bolted to Victaulic type coupling or gage, butterfly or check valves to have a minimum 5/8" flange spacer installed between the connector and the coupling flange.
 8. Connectors for pipe size 2" and smaller shall have threaded female union couplings on each end. Larger pipe sizes shall be fitted with flange couplings.
 9. Type FC-1 flexible connector shall be similar to Mason Industries Super-Flex Type MFTNC or MFTFU.
- C. Type FC-2 (Flexible Stainless Steel Hose)

1. Stainless steel hose and braid rated with 3:1 safety factor.
2. 2" and smaller with male nipples, 2 1/2" and larger with fixed steel flanges.
3. Lengths as follows:

Siz e		Lengt h	Siz e		Lengt h	Siz e		Lengt h
1/2	x	9	2	x	14	8	x	22
3/4	x	10	2	x	13	10	x	26
			1/2					
1	x	11	3	x	14	12	x	28
1	x	12	4	x	15	14	x	30
1/4								
1	x	13	5	x	19	16	x	32
1/2								
			6	x	20			

4. Type FC-2 flexible connector shall be similar to Mason Industries Type BSS.

D. Type FC-3 (Unbraided Exhaust Hose)

1. Low pressure stainless steel annularly corrugated with flanged ends.
2. Maximum temperature of 1500°F.
3. Lengths (in inches) as follows:

Siz e		Lengt h	Siz e		Lengt h
2	x	15	8	x	22
1/2					
3	x	16	10	x	26
4	x	17	12	x	28
5	x	18	14	x	30
6	x	19	16	x	32

4. Type FC-3 flexible connector shall be Mason Industries Type SDL-RF or equal by approved manufacturer.

E. Type FC-4 (Bronze Braided Flexible Hose)

1. Bronze hose and braid rated with a minimum 3:1 safety factor (minimum 150 psi).
2. Copper tube ends.

3. Minimum lengths (in inches) as follows:

Size	Length	Size	Length	Size	Length
1/8 x	7 1/2	3/4 x	11 1/2	3 x	27
1/4 x	8 1/4	1 x	13	3 1/2 x	32
3/8 x	9	1 x	14	4 x	33
		1/4 x	3/4		
1/2 x	9 3/4	1 x	17	5 x	41
		1/2 x			
5/8 x	10	2 x	20	6 x	48
		2 x	24		
		1/2 x			

4. Type FC-4 flexible connector shall be similar to Mason Industries Type BFF.

2.06 VIBRATION ISOLATION SCHEDULE

Equipment	HP	Mtn g	On Grade ****				Above Grade			
			Isol	Defl	Base	Rest r	Isol	Defl	Base	Rest r
Air Conditioning Condensers,		Roof	---	---	---	---	A	2.50	B-1	I
Air Conditioning Units (DX)		Flr Clg	A	1.0	---	II	A	1.0	B-1	I, II
			---	---	---	---	F	1.0	---	III
Centrifugal Fans		Flr Clg	A	1.0	B-1	II	A**	See	B-2	I, II
			---	---	***	---	F	Guid e	***	III
Curb Mounted Equipment		Roof	---	---	---	---	---	---	B-6	V
Other than AHU*****		Flr				V				V
Rooftop AHU >10 Ton		Roof	---	---	---	---	A	2.50	B-3	V

* Used on vertically arranged units. Rails shall be 1.5 times the unit height.

** Substitute Type B isolator for Outdoor installations.

*** Substitute Type B-2 base for floor mounted Class 2 and 3 fans.

**** "On Grade" shall mean slab on grade only.

***** Fans in all units shall be isolated in accordance with chart.

Notes:

- "Isol", "Base" and "Restr" columns indicate letter type as appears in the specs.

2. "Mtng" refers to method of support of equipment from the structure.
3. "See Guide" indicates isolator deflection selection to be taken from Deflection Guide below.

Deflection Guide	
RPM	MW Deflection
<400	3.5"
<600	2.5"
>600	1.5"

PART 3 - EXECUTION

3.01 GENERAL

- A. Isolation and seismic restraint systems must be installed in strict accordance with the manufacturer's written instructions and submittal data. Vibration isolators shall not cause any change of position of equipment resulting in stress on equipment connections.
- B. Design Criteria
 1. All mechanical equipment such as pumps, heat pumps, fans, air handling units, etc. shall be isolated from the building structure by means of noise and vibration isolators.
 2. All piping over 1" and ductwork in mechanical equipment rooms and penthouses diameter shall be isolated from the building structure by means of noise and vibration isolation hangers.
 3. Piping and/or ductwork penetrations through floors and walls shall not be rigidly connected to the building structure. Provide sleeves with clearances around the outside, as recommended by the vibration materials manufacturer. All such penetrations shall be smokeproofed and firestopped in an approved manner as hereinbefore specified.
 4. Generally, isolation facilities shall be designed to limit equipment room floor or roof loading to a maximum of 50 lbs./sq.ft. and vibration isolators shall be carefully and specifically selected for each piece of equipment.

5. Flexible duct connections at fans and air handling units shall have a minimum clear gap of 3" between metal collars. Flexible connectors exposed to the weather shall be weatherproofed by the Mechanical Contractor. Refer to the Sheet Metal Section of this specification for requirements of flexible duct connections.
6. Piping found to have water hammer or other objectionable vibration or noise which cannot be eliminated by proper grading or other natural means shall be braced, trapped, hung with vibration isolation hangers, equipped with air chambers or mechanical shock absorbers, flexible pipe connectors, or otherwise silenced using means as approved by the Architect.
7. Motor driven equipment which is to be isolated shall have motor mounted on the isolated equipment or shall have motor, equipment and drive mounted on a common base.
8. The Contractor shall not install any equipment, piping or conduit which makes rigid contact with the "building" unless permitted in this Specification. Building includes, but is not limited to, slabs, beams, columns, studs and walls.
9. Isolation mounting deflection shall be (minimum) as specified or scheduled on drawings.
10. Coordinate work with other trades to avoid rigid contact with the building. Inform other trades following work, such as plastering or electrical, to avoid any contact which would reduce the vibration isolation.
11. Bring to the Architect's attention, prior to installation, any conflicts with other trades that will result in unavoidable rigid contact with equipment or piping as described herein, due to inadequate space or other unforeseen conditions. Corrective work necessitated by conflicts after installation shall be at the responsible contractor's expense.
12. Bring to the Architect's attention any discrepancies between the specifications and field conditions or changes required due to specific equipment selection, prior to installation. Corrective work necessitated by discrepancies after installation shall be at the

contractor's expense.

13. Obtain inspection and approval of any installation to be covered or enclosed, prior to such closure.
14. Correct, at no additional cost, all installations which are deemed defective in workmanship or materials.

3.02 EQUIPMENT ISOLATION INSTALLATION

- A. Equipment shall be isolated and restrained as per the vibration isolation schedule at the end of this Section.
- B. Place floor mounted equipment on 4" high concrete housekeeping pads (unless detailed otherwise) properly doweled or expansion shielded to the deck to meet acceleration criteria. Anchor isolators and/or bases to housekeeping pads. Housekeeping pad concrete work shall be by Division 3. Housekeeping pads shall be sized to have a minimum of 6" of clearance all around the equipment or 12 bolt diameters, whichever is greater.
- C. Additional Requirements
 1. The minimum operating clearance under inertia bases shall be 2".
 2. The minimum operating clearance under other bases shall be 1".
 3. All bases shall be placed in position and supported temporarily by blocks or shims, as appropriate, prior to the installation of the equipment, isolators and restraints.
 4. The isolators shall be installed without raising the equipment.
 5. After the entire installation is complete, and under full operational load, the isolators shall be adjusted so that the load is transferred from the blocks to the isolators. The blocks shall be barely free and shall be removed. Remove all debris from beneath the equipment and verify that there are not short circuits of the isolation. The equipment shall be free in all directions.
 6. Install equipment with flexibility in wiring.

3.03 PIPING AND DUCTWORK ISOLATION INSTALLATION

- A. Isolate piping and ductwork outside shafts connected to rotating or reciprocating equipment and pressure reducing stations.
- B. The isolators shall be installed with the hanger box hung as closely as possible (without direct contact) to the structure.
- C. The isolators shall be suspended from substantial structural members sized for a maximum deflection of $L/360$ at mid span, not from slab diaphragm, unless specifically permitted by the structural engineer.
- D. Hanger rods shall not short circuit the hanger box.
- E. Horizontal suspended water piping 1 1/4" to 2" shall be suspended by Type E isolators with a minimum 3/8" deflection. Water pipe larger than 2" shall be supported by Type F isolators with a minimum 0.75" deflection or same deflection as equipment for the first (3) locations nearest equipment, whichever is greater.
 - 1. Type L isolators may be substituted for the above.
 - 2. Horizontal floor and roof supported pipe shall be the same as above except use isolators Type D and Type A, respectively.
- F. Ductwork shall be supported by Type C isolators with a minimum 0.75" deflection.
- G. Vertical riser pipe supports, where required, under 2" diameter shall utilize Type H isolation.
- H. Vertical riser guides, where required, shall avoid direct contact of piping with the building.
- I. Pipe anchors or guides, where required, shall utilize Type K isolators.
- J. Riser sway supports, where required, shall utilize (2) neoprene elements (Type G or H) to accommodate tension and compression forces.
- K. Install Type FC-1 (FC-4 for refrigerant piping) flexible connectors at all connections of pipe to isolated equipment such as pumps, as shown on the drawings.
- L. Install FC-2, FC-3 or FC-4 type connectors only at locations which exceed temperature or service (such as gas, fuel oil, or refrigerant) limitations of FC-1.

3.04 SEISMIC RESTRAINTS INSTALLATION

- A. All floor mounted equipment, whether isolated or not, shall be bolted or welded to the structure to allow for required acceleration. Bolt points, diameter of inserts, imbedment depth and weld length as shown on approved submittal drawings shall be followed in all respects.
- B. All suspended equipment shall be 2-point or 4-point independently braced with Type III restraints, installed taut for non-isolated equipment, such as piping or ductwork and slack with 1/2" cable deflection for isolated equipment. Note: Stiffeners for support rods may be required, certifications shall clearly delineate when such stiffening is required or not.
 - 1. Piping Bracing: Schedule 10 thru 40 welded, screwed, flanged or grooved; 40'-0" maximum transversely, 80'-0" maximum longitudinally, and within 4'-0" each change of direction. No- hub piping shall be at 10'-0" intervals or 40'-0" if 1.0 g couplings are used.
 - 2. Ductwork Bracing: 30'-0" maximum, transversely, 60'-0" maximum longitudinally, and within 4'-0" of each change of direction.
- C. Seismic restraints are not required on the following (there are no exceptions for piping containing flammable or hazardous material or connected to life/safety equipment):
 - 1. Piping in mechanical equipment rooms less than 1 1/4".
 - 2. Other piping less than 2 1/2".
 - 3. All rectangular ducts less than 6 sq.ft. in cross sectional areas.
 - 4. All round ducts less than 28" diameter.
 - 5. All pipe suspended by individual hangers 12" in length or less from the top of the pipe support to the bottom of the support for the hanger.
 - 6. All top supported ducts suspended by hangers 12" or less in length from the top of the duct to the bottom of the support for the hanger.
- D. Where base anchoring of equipment is insufficient to resist seismic forces, restraints such as Type III shall be located above the unit's center of gravity to resist "G" forces.

- E. Note: Vertically mounted tanks and upblast tubular centrifugal fans may require this additional restraint.
- F. For overhead supported equipment, overstress of the building structure must not occur. Bracing may occur from:
 - 1. Upper flanges of structural beams.
 - 2. Upper truss chords in bar joists.
 - 3. Cast-in-place inserts or drilled and shielded inserts in concrete structures.
- G. Pipe risers through cored shafts require no additional seismic bracing. (Core diameters to be a maximum of 2" larger than pipe O.D.)
- H. Non-Isolated Equipment Installation
 - 1. All ceiling suspended pipe and duct not excluded by diameter or distance from structure allowances.
 - a. Restraint Type III or V.
 - 2. All ceiling suspended equipment including, but not limited to, fans, heat pumps, unit heaters, cabinet unit heaters, etc.
 - a. Restraint Type III or V. (If equipment is rigidly attached to duct on one side, they shall be considered ductwork.)
 - 3. Suspended ceilings containing diffusers and light fixtures may be considered as meeting seismic zone requirements. In which case, earthquake clips or other approved means of positive attachment shall secure fixture to T-bar structure.
 - 4. All floor or wall mounted equipment and tanks.
 - a. Restraint Type III or V.
 - 5. Roof (curb) mounted AC, H&V units, or fans to be mounted on seismically rated curbs.
 - a. Base Type B-4.
- I. Inspection
 - 1. On completion of installation of all vibration

isolation and seismic restraint devices herein specified, the local representative of the isolation materials manufacturer shall inspect the completed system and report in writing any installation errors, improperly selected isolation or restraint devices, or other faults that could affect the performance of the system. Contractor shall submit a report to the Architect, including the manufacturer's representative's final report, indicating all isolation reported as properly installed or requiring correction, and include a report by the Contractor on steps taken to properly complete the isolation work.

2. Provide all special inspections in accordance with IBC and as specified herein.
 - a. Continuous inspection: The full-time observation of work by an approved special inspector pursuant to IBC Section 1704. The following pieces of equipment require these inspections:
 - 1) All equipment using combustible or toxic energy sources.
 - 2) All electric motors and motor control centers.
 - 3) Reciprocating and rotating type machinery.
 - 4) Pipe, 3" & larger.
 - 5) Tanks, heat exchangers & pressure vessels.
 - b. Periodic inspection: Provide intermittent observation of work by an approved special inspector of the following pieces of equipment in compliance with IBC section 1704
 - 1) All smoke control systems during construction & prior to concealment for leakage testing.
 - 2) Isolator units for seismic isolation system.
 - 3) All flammable, combustible and highly toxic piping and their associated mechanical systems.
 - 4) All ductwork containing hazardous materials.

- c. After all inspections a written report shall be provided.

3.05 INSTALLATION INSTRUCTIONS

- A. Adjust all base and piping isolators as required to prevent stress transfer to equipment.
- B. Set steel bases for 1" clearance between housekeeping pad and base. Set concrete inertia bases for 2" clearance. Adjust equipment level.
- C. Position equipment, structural base and concrete base on blocks or wedges at proper operating height.
- D. Provide all equipment and provide operating load conditions before transferring base isolation loads to springs and removing wedges.
- E. Install inertia bases of type and thickness, with isolators of type and static deflection indicated.
- F. Provide isolators as specified and install in accordance with the manufacturer's recommendations. Seismic restraints shall not be installed until isolators are adjusted and equipment height is finalized.
- G. Provide forms for 4" high housekeeping pads under all floor mounted equipment, including those with inertia blocks.
- H. Install equipment with flexibility in wiring connection.
- I. Verify all installed isolators and mounting system permit equipment motion in all directions.
- J. Adjust or provide additional resilient restraints to flexibly limit lateral motion to 1/4" during start-up of equipment.
- K. Before start-up, clean out all foreign matter between bases and equipment to prevent short circuit.
- L. Install flexible pipe connectors on pipe connected to equipment supported by vibration isolation. Hook up piping to equipment and mains with spool pieces. After completion of pressure testing but prior to start-up, remove spool pieces and install flexible pipe connectors. Identify spool pieces as to equipment served and either entering or leaving.

3.06 CERTIFICATION

230548 MECHANICAL VIBRATION CONTROLS AND SEISMIC RESTRAINTS

- A. Upon completion of installation of all vibration isolation devices and seismic restraints, the Mechanical Contractor shall hire an independent Seismic Professional Engineer to visit the site, inspect the completed project and certify in writing to the Architect that all systems are installed properly, or require correction.

END OF SECTION 230548

SECTION 230553 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install nameplates, stencils and pipe markers on all Mechanical equipment, piping and ductwork.
- B. Provide nameplates with the unit number and service designation on all mechanical equipment.
- C. Provide manufactured pipe and ductwork identification stencils with flow arrows and service indicated. All backgrounds of the stencils shall be color coded with specific service designation

.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. ASME A 13.1 - Scheme for Identification of Piping Systems; The American Society of Mechanical Engineers.

1.05 SUBMITTALS

- A. See Section 230500 and General Conditions for Additional Requirements.
- B. Product Data: Submit product description including materials, attachment methods, color coding and lettering sizes.

1.06 QUALITY ASSURANCE

- A. All materials, lettering and individual system color coding schemes shall be uniform and of one single manufacturer.
- B. No identification shall be installed until all systems are complete and insulated.
- C. All surfaces shall be cleaned.
- D. No nametag or identification shall break or penetrate a surface used as a vapor barrier.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all local/state and NFPA requirements for color-coding or painting of systems, piping or equipment related to Life Safety or Fire Protection.

1.08 DELIVERY, STORAGE AND HANDLING

- A. All identification systems shall be stored in sealed containers in suitable locations to keep the containers and contents dry and clean.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. All surfaces shall be cleaned and dry before applying any form of identification or tagging.
- B. Consult with the manufacturer prior to installation for the proper tagging and identification procedure and materials to be used on exterior outdoor equipment.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Acceptable manufactures contingent on compliance with the specification.
 - 1. Seton
 - 2. W. H. Bradey Company
 - 3. Marning Services Incorporated

2.02 PIPE IDENTIFICATION

- A. All piping, except that piping which is within inaccessible chases, shall be identified with semi-rigid plastic identification markers equal to Seton Setmark pipe markers.
 - 1. Direction of flow arrows is to be included on each marker.
 - 2. Each marker background shall be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identification of Piping Systems" (ASME A13.1-1981).
 - 3. Setmark snap-around markers shall be used for overall diameters up to 6"
 - 4. Markers shall be located:
 - a. At each pipe passage at 20' - 0" intervals maximum.

2.03 DUCTWORK IDENTIFICATION

- A. All ductwork (supply, return, exhaust, etc.) serving multiple spaces shall be identified with directional flow arrows and unit identification numbers (AHU-1, EX-1, etc.) on the side of each duct (or bottom if abutting other systems or obstructions).
- B. All flow arrows and labels shall be similar to Seton Name Plate Company vinyl labels or stencil painted.
- C. All duct access doors.

2.04 EQUIPMENT NAMEPLATES

- A. Equipment nameplates shall be 3" x 6" long, 0.02" aluminum with a black enamel background with engraved natural aluminum letters similar to Seton Style 2065-20. Nameplate shall have pressure sensitive taped backing.
- B. The nameplate shall contain the unit or equipment designation (, "RTU" for Roof Top Unit, "EX" for Exhaust Fan, etc.), unit number and area or system served.

PART 3 - EXECUTION

3.01 PREPARATION

- A. All surfaces shall be cleaned and insulated (if applicable) prior to installing any identification.
- B. Exterior surfaces of outdoor equipment shall be dry and prepared to accept the specified identification.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion. Seal with clear lacquer.
- B. Install duct markers in accordance with manufacturer's instructions.
- C. Install plastic pipe markers in accordance with manufacturer's Instructions.
- D. Install plastic tape markers complete around pipe in accordance with manufacturer's instructions.
- E. Tag automatic controls, instruments and relays. Key to control schematic.
- F. Identify piping, concealed or exposed, with pipe markers using plastic tape pipe markers. Use tags on piping $\frac{3}{4}$ inch diameter and smaller. Identify service, flow direction and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, , at each side of penetration of structure or enclosure, and at each obstruction.
- G. Identify ductwork with plastic nameplates and flow arrows. Identify with air handling unit or fan identification number and area served. Locate identification at each side of

penetration of structure or enclosure, and at each
obstruction.

END OF SECTION 230553

SECTION 230593 - TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Provide all labor, instruments and materials necessary to completely test, adjust and balance all HVAC systems and equipment installed under this contract.
- B. All instruments shall be newly calibrated for this specific project.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. AABC MN-1 - National Standard for Testing and Balancing Heating, Ventilating and Air Conditioning Systems.
 - 2. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.

1.05 SYSTEM DESCRIPTION

- A. Provide under this contract the services of an independent test and balance firm that specializes in testing and

balancing of HVAC systems. The following services shall be provided:

1. Preconstruction Plan Check and Review: Review the design documents prior to commencing construction.
2. On-going job site inspections of equipment, controls and metering devices during construction to verify conformance with design specifications.
3. Air System Balance
4. Control Systems Verification
5. Special System Testing and Verification
 - a. Duct leakage testing
 - b. Sound and vibration testing
6. Existing system performance testing
7. System Performance Verification
8. Opposite Season Test

1.06 SUBMITTALS

- A. See Section 013323 - Shop drawings and Samples, for submittal procedures.
- B. Submit name of testing, adjusting and balancing contractor for approval within 30 days after award of Contract.
- C. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting and balancing of systems and equipment to achieve specified performance.
 1. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing and equipment data required.
 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for inclusion in operating and maintenance manuals.
 3. Provide reports in letter size, 3 ring binder manual, complete with index page and indexing tabs with cover identification at front and side. Include set of

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reduced drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations.

4. Include detailed procedures, agenda, sample reports forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
5. Test Reports: Indicate data on AABC MN-1 forms, forms prepared following ASHRAE 111, NEBB forms, or forms containing information indicated in Schedules.
6. Include the following on the title page of each report.
 - a. Name of Testing, Adjusting and Balancing Agency.
 - b. Address of Testing, Adjusting and Balancing Agency.
 - c. Telephone number of Testing, Adjusting and Balancing Agency.
 - d. Project name.
 - e. Project location.
 - f. Project Architect.
 - g. Project Engineer.
 - h. Project Contractor.
 - i. Report date.
- D. Project Record Documents: Record actual locations of all water systems balancing valves and rough setting.

1.07 DEFINITIONS

- A. AABC: The Associated Air Balance Council is a non-profit association of independent, certified agencies specializing in testing and balancing HVAC systems.
- B. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers.
- C. HVAC: Heating, Ventilating and Air Conditioning.

- D. TAB: Testing, Adjusting and Balancing of HVAC Systems to meet design objectives and obtain optimum system performance.
- E. TBE: Test and Balance Engineer is an individual certified by AABC as having a degree in Engineering and (3) years of test and balance experience, or (5) years of background in the air conditioning field and (5) years continuous field experience in testing and balancing work. The TBE must also pass the AABC Test and Balance Engineer Certification Examination.

1.08 AGENCY QUALIFICATIONS

- A. Testing and balancing agency shall be a member of AABC or NEBB with a minimum of five (5) years of documented experience.
- B. An AABC certified NEBB certified testing and balancing person shall be responsible for certification of the total work of this section.
- C. All work shall be performed in accordance with AABC National Standards. If these specifications set forth more stringent requirements than the AABC National Standards, the more stringent specifications shall prevail.

1.09 QUALIFICATION SUBMITTALS

- A. Testing and Balancing Agency shall submit a company resume listing personnel and project experience in the field of air and hydronic system balancing.
- B. Testing and balancing agency shall submit an inventory and calibration data of all instruments and devices in possession of the balancing agency to enable the Owner or his representative to evaluate the balancing agency's performance capability.
- C. The testing and balancing agency shall submit to the Owner or the Owner's representative, upon acceptance of the contract, an AABC or NEBB "Quality Assurance Guaranty."
- D. Within (30) days after acceptance of the contract, the testing and balancing agency shall submit to the Design Engineer a working agenda which will include procedures for testing and balancing each type of air and water flow system. The Test and Balance Report format will also be submitted indicating data to be recorded.

1.10 CONTRACT DOCUMENTS

- A. Within (30) days after selection of the test and balance agency, the Contractor Construction Manager shall provide the agency with the following:
 - 1. Construction Drawings
 - 2. Equipment Specifications
 - 3. Equipment Submittals
- B. The testing and balancing agency shall be provided the following as issued or received:
 - 1. Change Orders
 - 2. Equipment Manufacturer's Submittal Data
 - 3. Mechanical/Air Conditioning Shop Drawings
 - 4. Temperature Control Drawings
 - 5. Project Schedule

1.11 NOTIFICATION AND SCHEDULING

- A. A prebalance conference shall be held prior to job start as scheduled by the Owner or Owner's representative. Attendees at the meeting shall include representatives of the test and balance agency, Contractor, Owner and Mechanical Engineer.
- B. The schedule for testing and balancing the HVAC system shall be established by the Owner or Owner's representative, in coordination with the testing and balancing agency on a critical path network.
- C. The testing and balancing agency is responsible for initiating this continuing coordination to determine schedule for final testing and balancing services.
- D. It will be necessary for the testing and balancing agency to perform its services in close coordination with the Contractor, with all scheduling and deficiencies reported through the Owner or Owner's representative.
- E. Before testing and balancing commences, the testing and balancing agency shall receive notification, in writing,

from the Contractor that the system is operational, complete, and ready for balancing.

- F. A completed system exceeds physical installation: the Contractor shall certify that heat pump are in good working order, and that full load performance has been preliminary tested.
- G. The Contractor shall certify in writing, that all equipment has been checked, started, adjusted by the manufacturer, and operated for the specified period of time.

1.12 COORDINATION WITH OTHER TRADES

- A. To bring the existing or new HVAC system into a state of readiness for testing, adjusting and balancing, the Contractor shall perform the following:
 - 1. Air Distribution Systems
 - a. Ensure that all volume, smoke and fire dampers are properly located and functional. Dampers serving requirements of smoke, minimum and maximum outside, return, relief, and exhaust air shall provide tight closure and full opening, with a smooth and free operation.
 - b. Verify that all supply, return, exhaust, and transfer grilles, registers and diffusers are installed and operational.
 - c. Ensure that roof top units, air handling systems, units, makeup air units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc. are blanked and/or sealed to eliminate excessive bypass or leakage of air.
 - d. Ensure that all fans (exhaust) are operating and free of vibration. All fans and drives shall be checked for proper fan rotation and belt tension. Overload protection shall be of proper size and rating. A record of motor current and voltage shall be made to verify that the motors do not exceed nameplate rating.
 - e. Make any necessary changes to the sheaves, belts, and dampers, as required by the testing and balancing agency, at no additional cost to Owner.

- f. Install clean filters prior to testing.
- B. The Contractor shall perform the following:
 - 1. Verify that all control components are installed in accordance with project requirements and are functional.
 - 2. Verify that all controlling instruments are calibrated and set for design operating conditions.
 - 3. Calibrate room thermostats after installation and before the thermostat control verification tests are performed. The test and balance agency shall verify the accuracy of final settings by taking temperature readings. The readings shall be in a typical conditioned space for each separately controlled zone.
 - 4. The Contractor shall allow sufficient time in the project to provide assistance and instruction to the testing and balancing agency in the proper use and setting of control components such as, but not limited to, computers, static pressure controllers or any other device that may need setpoints changed so that the testing and balancing work can be performed.
- C. The Contractor, and the suppliers of the HVAC equipment, shall all cooperate with the testing and balancing agency to provide all necessary data on the design and proper application of the system components. In addition, they shall furnish all labor and materials required to eliminate any system deficiencies.
- D. In coordination with the Contractor, the testing and balancing agency shall arrange for an area of ample size and convenient location for storage of tools, equipment, and other items as required.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The Contractor shall procure the services of an independent Balancing and Testing Contractor who specializes in the balancing and testing of heating, ventilating and air conditioning systems to balance and adjust, all moving equipment and air distribution and exhaust systems and test all water systems and equipment, as herein specified. All work by the Balancing Contractor shall be done under direct

supervision of a qualified heating and ventilating Engineer employed by the Balancing Contractor.

- B. Balance and testing shall not begin until all HVAC systems have been completed and are in full working order, as determined by the Engineer. The Balancing Contractor shall coordinate his work with the Contractor, shall place all heating, ventilating and air conditioning systems and equipment into full operation, and continue the operation of same during each working day of adjusting and balancing.
- C. The Balancing Contractor shall perform all tests as hereinafter specified, compile the test data, and submit five (5) copies of the complete test data to the (Owner) for forwarding to the Architect for evaluation and approval.
- D. The Contractor shall award the test and balance contract to the approved agency at the beginning of construction of the project to allow the Balancing Contractor to schedule this work in cooperation with the Contractor and other Trades involved and comply with completion data and requirements, as well as provide a list of areas where special requirements for balancing devices (dampers) might occur.
- E. The Balancing Contractor shall provide all testing instruments used for balancing air. Testing instruments shall have been calibrated within a period of six (6) months prior to balancing. Types, serial numbers and dates of calibration of all instruments shall be listed in the final air balance reports herein specified.
- F. The Architect's, Engineer's and Owner's designated representatives shall be notified minimum five (5) days in advance of proceeding with balancing work to allow time for the witnessing of the testing, balancing and adjusting.
- G. The Balancing Contractor shall provide all manpower, instruments, temporary connections and all other materials required to accomplish the balancing and testing as hereinafter specified.
- H. In the event it becomes necessary for the Owner to balance the HVAC systems correctly, after the balancing is complete, the cost of this work will be back charged to the Balancing Contractor.

2.02 SCHEMATIC SYSTEM DRAWINGS

- A. Ductwork Systems

1. The Balancing Contractor shall prepare schematic diagrammatic drawings for the following:
 - a. Supply air systems (all units)
 - b. Return air systems (all units)
 - B. The intent of the required documentation would be to clearly indicate the balancing and performance of the systems as they are installed. Furthermore, the above-required information will be utilized by the Owner for future renovation and/or alterations of the various systems. Therefore, the drawing content and presentation will be submitted to the Engineer for review prior to actual commencement of the work. In the case of phased construction, the schematics shall indicate the limit of each phase and any temporary measures taken to obtain system performance.
 - C. The drawings shall be produced on AutoCAD 2017 or newer, and a CD and one (1) set of reproducible drawings shall be submitted to the Owner through the Engineer, for his use. All costs associated with the production of the documents shall be included under the Balancing Contractor's contract.
 - D. Test Code Drawings
 1. Each report shall contain a single line drawing or drawings of the air distribution system with the fan system, applicable zoning, etc., indicated. Each and every outlet supply and return shall be indicated on this drawing by a number corresponding to the number of the outlet test sheet.
- 2.03 TEST FORMS USED BY BALANCING ENGINEERS AND TECHNICIANS SHALL BE SET UP TO INCLUDE THE FOLLOWING INFORMATION:
- A. Each sheet shall have the job name and address, the name of the Balancing Contractor, Owner, Architect and Engineer, the instruments used to perform the test, and the name of the test Technician, date and time of test, outside db/wb temperatures.
 - B. All forms shall be submitted on a standard 8 1/2" by 11" good quality paper, bound together to form a complete report. All forms shall be submitted in typewritten form; handwritten forms are not acceptable. Cover of first sheet shall list the name of the job and the location of same. Copies of all forms shall be submitted to the Architect for review and acceptance prior to the work beginning.

C. Diffuser, Grille, Register, and All Types of Air Terminal Test Sheets

1. Each sheet shall be arranged in columns and all final sheets shall show the following data:
 - a. Fan system.
 - b. Room number or area designation.
 - c. Outlet code number which shall correspond to code number.
 - d. Size of outlet - manufacturer's listed data.
 - e. Type of outlet per manufacturer's model designation.
 - f. Manufacturer of outlet.
 - g. Manufacturer's effective area for each size.
 - h. Schedule FPM and required CFM of each outlet, individually for heating and cooling.
 - i. Test resultant FPM and CFM of each outlet, individually for heating and cooling.
 - j. Testing, setting and report of CFM settings for each terminal box, including pressure drop at each setting.

D. Velocity and Pressure Test Sheets for Main and Branch Ducts

1. Duct location or designation.
2. Duct size.
3. Number of velocity readings.
4. Duct average velocity.
5. Total CFM.
6. Duct average static pressure.

PART 3 - EXECUTION

3.01 AIR SYSTEM BALANCING AND TESTING PROCEDURES

- A. The Balancing Contractor shall perform the following tests, and balance all systems in accordance with the following requirements after clean filters are installed in all filter banks before tests are performed:
1. Testing of existing system performance.
 - a. Test and report existing system static pressure at unit.
 - b. Test and report existing supply/return air flow at unit.
 - c. Measure air quantities of supply and return at unit by traversing entire cross sectional area of air inlet or outlet with pitot tube. Ducts having velocities of 1000 feet per minute or more shall be measured with inclined manometers (draft gauge) or magnehelic gauges; ducts having velocities of less than 1000 per feet per minute shall be measured with micromanometers, hook gauges, or similar low pressure instruments. Openings in ducts for pitot tube insertion shall be sealed with snap-in plugs and covered with duct tape after air balance is complete.
 2. Test and adjust to achieve design requirements.
 - a. Test and report system static pressure.
 - b. Test and record entering and leaving air temperatures (db-wb cooling and db heating).
 - c. Adjust all main supply, and return air ducts to proper design CFM.
 - d. Adjust all zones and branches to proper design CFM, supply and systems.
 - e. Test and adjust each diffuser, grille, register, and constant volume box to within $\pm 5\%$ of design requirements.
 - f. Identify and list size, type and manufacturer of diffusers, grilles, registers, and terminal volume boxes.

- g. Measure air quantities in main and branch ducts by traversing entire cross sectional area of duct with pitot tube. Ducts having velocities of 1000 feet per minute or more shall be measured with inclined manometers (draft gauge) or magnehelic gauges; ducts having velocities of less than 1000 per feet per minute shall be measured with micromanometers, hook gauges, or similar low pressure instruments. Openings in ducts for pitot tube insertion shall be sealed with snap-in plugs and covered with duct tape after air balance is complete. Diffuser, grille and register air quantities shall be determined by direct reading velocity meters in accordance with the manufacturer's recommendations.
- h. Branch duct air quantities shall be adjusted by volume dampers. Dampers shall be permanently marked after air balance is complete to enable them to be restored to their correct position if disturbed at any time.
- i. Any dampers required for final balancing, as determined by the Balancing Contractor and the Engineer, will be provided by the Contractor to ensure proper performance, at no extra cost to the Owner.

3.02 CONTROL SYSTEMS VERIFICATION

- A. Verify all control devices are properly connected.
- B. Check the location of all thermostats for potential erratic operation from outside influences such as sunlight, drafts or cold walls.
- C. Check the sequence of operation that any control mode is in accordance with approved shop drawings.
- D. Verify all controller setpoints meet the design intent.
- E. Verify the operation of all interlock systems.
- F. Perform all systems verification to ensure the safety of the system and its components.

3.03 SPECIAL SYSTEMS TESTING

A. Duct Leakage Testing

1. Testing shall be conducted before external insulation is applied and before ducts are connected.
2. Mechanical Contractor to close off and seal all openings in the duct section to be tested.
3. Each section shall be tested by the Mechanical Contractor in accordance to the leakage class as specified under SMACNA Standards. All tests shall be witnessed and documented by the TAB Contractor.

3.04 SYSTEM PERFORMANCE VERIFICATION

- A. At the time of final inspection, the test and balance agency shall recheck, in the presence of the Owner's representative, specific and random selections of data, air quantities, and air motion recorded in the Certified Report.
- B. Points and areas for recheck shall be selected by the Owner's representative.
- C. Measurement and test procedures shall be the same as approved for work forming basis of Certified Report.
- D. Selections for recheck, specific plus random, will not normally exceed 25% of the total number tabulated in the report.
- E. If random tests elicit a measured flow deviation of 10% or more from that recorded in the Certified Report listings, by 10% or more of the selected recheck stations, the report is rejected, all systems shall be readjusted and tested, new data recorded, new Certified Report submitted, and new inspection tests made, all at no additional cost to Owner.
- F. Following system verification of the Certified Report by the Owner's representative, the settings of all dampers, and other adjustment devices shall be permanently marked by the testing and balancing agency so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after system verification.
- G. any modifications to the initial adjustments to produce optimum system operation.

3.05 RECORD AND REPORT DATA

- A. The test and balance report shall be complete with logs, data and records as required herein. All logs, data and records shall be typed on white bond paper and bound. The report shall be certified accurate and complete by the testing and balancing agency's certified balancing engineer.
- B. Six (6) copies of the test and balance report are required and shall be submitted to the Owner or the Owner's representative.
- C. The report shall contain the following general data in a format selected by the testing and balancing agency.
 - 1. Project number.
 - 2. Contract number.
 - 3. Project title.
 - 4. Project location.
 - 5. Project architect.
 - 6. Project mechanical engineer.
 - 7. Test and balance agency.
 - 8. Balancing Engineer.
 - 9. Contractor.
 - 10. Date tests were performed.
 - 11. Certification.
- D. The test and balance report shall be recorded on report forms conforming to the recommended forms in AABC National Standards. At a minimum, the report shall include:
 - 1. Preface: A general discussion of the system, any abnormalities and problems encountered.
 - 2. Instrumentation List: The list of instruments including type, model, manufacturer, serial number, and calibration dates.
 - 3. System Identification: In each report the supply and return openings and traverse points shall be numbered

and/or lettered to correspond to the numbers and
letters used on the report data sheets.

END OF SECTION 230593

230593 TESTING, ADJUSTING AND BALANCING

SECTION 230713 - DUCT INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Section, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all duct insulation, vapor barriers, jackets, finishes, adhesives, cements and accessories to make a complete and insulated system of all ductwork, fittings, joints, offsets and accessories specified herein.
- B. All insulation system materials shall conform to the maximum flame spread/smoke developed ratings specified herein.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Steel and Plate.
 - 2. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and plate (Metric).
 - 3. ASTM C 518 - Standard Test method for Steady-State Heat Flux Measurements and Thermal Insulating and Finishing Cement.

4. ASTM C 553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
5. ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
6. ASTM C 921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
7. ASTM C 1071 - Standard Specification for Thermal and Acoustical Insulation (Glass, Fiber, Duct Lining Material).
8. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
9. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
10. ASTM E 162 - Standard Test Method for Surface flammability of Materials Using a Radiant Heat Energy Source.
11. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
12. NFPA 96 - Ventilation Control and Fire Protection of Commercial Cooking Operations.
13. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
14. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible.
15. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.
16. ANSI/ASHRAE 90.1 - Energy Conservation in New Building Design.

1.05 SUBMITTALS

- A. See Section 230500 and General conditions for additional requirements.

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- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.06 QUALITY ASSURANCE

- A. All insulation materials, finishes, coatings, cements, tapes, jackets and other insulation accessories shall have minimum composite or individual fire hazard ratings as well as thickness and "C" values conforming to State Building Codes which control building construction materials that may be used on this project. Where specification requirements exceed the Code requirements, the specification shall govern.
- B. Insulation for the various duct systems and associated equipment shall be composed of materials which are non-combustible and/or provide a fire resistive system of insulation which complies with the applicable Code having jurisdiction. Generally, it is required that fire hazard ratings shall not exceed the following, except as noted:
 - 1. Flame Spread Rating: 25 (No Exceptions)
 - 2. Smoke Developed Rating: 50
- C. All fire hazard ratings shall be as determined by NFPA 255 "Method of Test of Surface Burning Characteristics of Building Materials", ASTM E84 or UL 723.
- D. All insulation materials herein specified shall be used subject to the manufacturer's temperature limitations and their compatibility with other materials.
- E. Installation of all insulation work shall be executed by a qualified Contractor who is thoroughly experienced in this particular type of work and who has adequate facilities and equipment for installation of all insulation work herein specified and who is familiar with the requirements of the Code enforcing Authorities as to fire hazard rating.
- F. The finished installation shall present a neat and workmanlike appearance with all jackets smooth, with all vapor barriers sealed and intact.

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- G. Where insulation is specified for ductwork, insulate similarly all collars, dampers, edges, joints, etc. connected to system subject to heat loss or gain. Do not cover damper actuators or other maintenance points on equipment unless identified on the insulation with removable access panels or covers.

1.07 REGULATORY REQUIREMENTS

- A. Conform to maximum flame spread/smoke developed rating of 25/50 in accordance with ASTM E 84, NFPA 255, or UL 723.

1.08 DELIVERY, STORAGE AND PROTECTION

- A. Accept materials on site, labeled with manufacturer's identification, product density and thickness.
- B. All materials shall be stored in a dry area free from moisture and debris.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during and after installation for minimum of 24 hours.

PART 2 - PRODUCTS

2.01 MANUFACTURERS ACCEPTABLE FOR PRODUCT TYPES INDICATED CONTINGENT UPON PRODUCTS' COMPLIANCE WITH THE SPECIFICATIONS

- A. Insulation:
 - 1. Manville Corporation.
 - 2. Owens-Corning Fiberglass Corporation.
 - 3. Armstrong World Industries, Incorporated.
 - 4. Certainteed Corporation.
 - 5. Knauf
- B. Mastics and adhesives:

1. Childers Products Company.
2. H. B. Fuller Company, Foster Products Division.
3. 3M Company Adhesives, Coatings and Sealers.
4. Armstrong World Industries, Incorporated.
5. Ruston Plant.
6. Chicago-Mastic
7. Insul-Cooustic
8. St. Clair Rubber
9. Vimasco
10. Baldwin-Ehret-Hill

2.02 RIGID FIBERGLASS BOARD INSULATION

- A. Rigid fiberglass board insulation shall be equal to Owens-Corning Fiberglas 25 with ASJ having an approximate density of 4.2 lbs./cu.ft. and an approximate thermal conductivity of 0.25 at 75°F.
- B. The insulation shall be applied by use of weld pins or stick clips. Such fasteners shall be spaced 3 inches from each corner of the board with intermediate pins spaced no more than 12 inches on center. Pin caps shall be covered with a round vapor seal patch that matches the jacket on the ASJ board.
- C. Ducts, plenums and equipment having sharp bend shall have the insulation scored as required to conform to the curved surfaces to provide a neat and workmanlike appearance when finished.
- D. All insulation edges and joints shall be sealed with a fire retardant vapor barrier adhesive, reinforced with a vapor barrier tape similar to that of the board facing. Tape shall be 3 to 5 inches wide as recommended by the particular manufacturer.

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- E. The above specified insulation will be used in all areas, and it is intended that the finish present a neat and uniform appearance as to color and workmanship.

2.03 ADHESIVES

- A. Code ADH-1: Fibrous adhesive, non-flammable, quick setting adhesive for calcium silicate. Similar to Childers CP-97, 98.
- B. Code ADH-2: Fast-drying vinyl base coating and lagging adhesive. Similar to Childers CP-50A HV2.
- C. Code ADH-3: Fast-drying neoprene base adhesive for lap joints of foil-faced facing applied over pipe insulation. Similar to Childers CP-82.
- D. Code ADH-4: Adhesive for use in adhering fiberglass board or blanket insulation to pipe and equipment. 3M Company Insulation Adhesive No. 35 or 38 non-flammable adhesive.

2.04 CAULKING COMPONENTS

- A. Code CC-1: For use with foam glass and/or joint sealant applications. Flexible elastomeric vapor barrier sealant. Similar to Childers CP-76.

2.05 MASTICS

- A. Code MAS-1: Vapor barrier mastic made with an elastomeric resin. For indoor use. Similar to Childers CP-30.
- B. Code MAS-2: A non-water vapor barrier asphaltic emulsion coating, breathing type, for above ground installations. Similar to Childers CP-10.
- C. Code MAS-3: Vapor barrier mastic made with an elastomeric resin. For outdoor use.

2.06 TIE WIRE

- A. Tie wire for securing insulation in place shall be type 304 stainless steel annealed steel wire of gauge and proper spacing as recommended by the insulation manufacturer. Wire shall be drawn up tightly enough to become embedded in the insulation and the ends of the loop twisted, bent over,

and pressed into the insulation so as to leave no ends protruding.

2.07 BANDING

- A. 3/4 inch x 0.02 inch type 304 stainless steel for additional insulation jackets.

2.08 WIRE MESH

- A. Wire mesh shall be one inch by No. 20 BGW hexagonal mesh galvanized.
- B. Expanded metal: Expanded metal shall be 1/2 inch Hi-Rib metal lath of copper bearing steel.

2.09 TAPE

- A. Lead foil tape, where specified, shall be 3M Company Lead Foil Tape No. 422, 4 mil thick, acrylic adhesive, 2 inch wide.
- B. Vinyl plastic tape, silver gray, flame resistant, vapor barrier sealant tape on rigid and flexible insulation material for warm or cold air ducts. Similar to 3M Company Duct Sealing Tape No. 474.
- C. Aluminum foil tape, dead soft aluminum foil, point seal on stick pin, metal patching, moisture barrier, heat reflecting and general sealing on aluminum facing foil. Similar to 3M Company Aluminum Foil Tape No. 425.

2.10 STAPLES

- A. Staples shall be galvanized clad outward clinching insulation staples.

PART 3 - EXECUTION

3.01 INSTALLATION OF INSULATION

- A. All insulation shall be applied by experienced contractors in accordance with best Trade practice.
- B. Test, inspect and clean all surfaces of ductwork to be insulated before applying insulation.

- C. Take all possible precautions to protect work of other Trades. Provide protective covering as required to accomplish this end. This Trade shall be responsible for returning all equipment and material to its original new condition and appearance where damage occurs due to his neglect.
- D. All ductwork shall have been tested and approved prior to installation of insulation.
- E. All ductwork and plenum or surfaces, where subject to condensation on the outside, shall be insulated including vapor seal finish.
- F. All surfaces to be insulated shall be clean, dry and free from dirt and scale when insulation is being applied. Insulation shall be dry at the time of installation and before and during the process of finished application.
- G. Butt ends will not be allowed. However, where required and approved by Architect, jacket material shall be pasted over exposed ends and banded to give a neat and finished appearance. Exposed fiberglass material will not be permitted.
- H. Surfaces of insulation shall be smooth, even and true to line with jackets drawn tight and smoothly secured. Scrap pieces of insulation shall not be used where a full length section will fit.
- I. The methods of application of insulation, finishes, adhesives, cements, accessories are generally specified under the material headings of these specifications. Where not specifically detailed, it is intended that they are equal or exceed the manufacturer's published recommendations, existing at time of bid openings, subject to the approval of the Architect.
- J. Butt covering neatly to walls, floors, ceiling. Apply band at end and position so band covers gap between surface and insulation where exposed.
- K. Fastenings: Provide where required to securely hold insulation. Apply adhesive and weld pins and/or stick clips on exposed risers to prevent slipping and turning of insulation. .

- L. Thickness of insulation shall not be compromised due to piping interferences, improper installation or any other reason.

PART 4 - SCHEDULES

4.01 DUCTWORK INSULATION SCHEDULE:

Service	Type Insulation and Thickness (Inches)	Facing	Additional Jacket
Outside Air Intake Ducts & Relief Plenums, Supply/Return Air Ductwork (Exposed)	Rigid Fiber GlassBoard Insulation 2.5"	FSKL	
Outside Ductwork supply, exhaust, return and other	Rigid Fiber GlassBoard Insulation 4"	FSKL	3M Ventureclad Plus 1579CW or approved equal
-	-	-	-

A. HVAC Insulation Schedule Notes

1. Provide vapor barrier on all ductwork insulation.

END OF SECTION 230713

SECTION 230719 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all piping insulation, vapor barriers, jackets, finishes, adhesives, cements and accessories to make a complete insulated system for all piping, valves, fittings, joints, offsets and flanges specified herein.
- B. All insulation system materials shall conform to the maximum flame spread/smoke developed ratings specified herein.
- C. Hard insulation material shall be provided at all hangers.
- D. Insulate the following:
 - 1. All scheduled piping, all valves, fittings, elbows, flanges and accessories.
 - 2. All piping exposed to weather including provision of additional weatherproof jacket.
 - 3. All vents and blow-offs in mechanical rooms and elsewhere within reach of personnel.
 - 4. Piping jacket covers.
 - 5. All heat traced piping.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Section of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this

Section, and are hereby incorporated into, and made a part of the Contract Documents.

- B. Material standards shall be as specified or detailed hereinafter and as follows:
1. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
 2. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Steel and Plate.
 3. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and plate (Metric).
 4. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus.
 5. ASTM C 195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
 6. ASTM C 240 - Standard Test Methods of Testing Cellular Glass Insulation Block.
 7. ASTM C 449/C 449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
 8. ASTM C 518 - Standard Test method for Steady-State Heat Flux Measurements and Thermal Insulating and Finishing Cement.
 9. ASTM C 533 - Standard Specification for Calcium Silicate Block and Pipe Terminal Insulation.
 10. ASTM C 534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 11. ASTM C 547 - Standard Specification for Mineral Fiber Pipe Insulation.
 12. ASTM C 552 - Standard Specification for Cellular Glass Thermal Insulation.
 13. ASTM C 578 - Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation.

14. ASTM C 591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
15. ASTM C 610 - Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation.
16. ASTM C 795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
17. ASTM C 921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
18. ASTM D 1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
19. ASTM D 1667 - Standard Specification for Flexible Cellular Materials - vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
20. ASTM D 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
21. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
22. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
23. ASTM E 96 - Standard Test Methods for Water Vapor Transmission Materials.
24. NFPA 225 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
25. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.
26. ANSI/ASHRAE 90.1 - Energy Conservation in New Buildings.

1.05 SUBMITTALS

- A. See Section 230500 and General Conditions for Additional Requirements.

- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.
- D. Installation Graphic Details.

1.06 QUALITY ASSURANCE

- A. All insulation materials, finishes, coatings, cements, jackets and other insulation accessories shall have minimum composite or individual fire hazard ratings as well as thickness and "C" values conforming to State Building Codes which control building construction materials that may be used on this project. Where specification requirements exceed the Code requirements, the specification shall govern.
- B. Piping insulation for the various piping systems and associated equipment shall be composed of materials which are non-combustible and/or provide a fire resistive system of insulation which complies with the applicable Code having jurisdiction. Generally, it is required that fire hazard ratings shall not exceed the following, except as noted:
 - 1. Flame Spread Rating 25 (No Exceptions)
 - 2. Smoke Developed Rating: 50
- C. All fire hazard ratings shall be as determined by NFPA 255 "Method of Test of Surface Burning Characteristics of Building Materials", ASTM E84 or UL 723.
- D. All insulation materials herein specified shall be used subject to the manufacturer's temperature limitations and their compatibility with other materials.
- E. Installation of all insulation work shall be executed by a qualified Insulation Contractor who is thoroughly experienced in this particular type of work and who has adequate facilities and equipment for installation of all insulation work herein specified and who is familiar with the requirements of the Code enforcing Authorities as to fire hazard rating.

- F. The finished installation shall present a neat and workmanlike appearance with all jackets smooth, with all vapor barriers sealed and intact.
- G. Where insulation is specified for piping, insulate similarly all connections, vents, drains and any piping connected to system subject to heat loss or gain. Do not cover vent petcocks, cleanouts or other maintenance points on equipment unless identified on the insulation with removable access panels or covers.
- H. All chilled water system piping, components and accessories are to be insulated in a manner so as to provide a complete, uninterrupted vapor barrier.

1.07 REGULATORY REQUIREMENTS

- A. Conform to maximum flame spread/smoke developed rating of 25/50 in accordance with ASTM E 84, NFPA 255, or UL 723.

1.08 DELIVERY, STORAGE AND PROTECTION

- A. Accept materials on site, labeled with manufacturer's identification, product density and thickness.
- B. All materials shall be stored in a dry area free from moisture and debris.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during and after installation for minimum of 24 hours.

PART 2 - PRODUCTS

2.01 MANUFACTURERS ACCEPTABLE FOR PRODUCT TYPES INDICATED CONTINGENT UPON PRODUCTS' COMPLIANCE WITH THE SPECIFICATIONS

- A. Insulation:
 - 1. Manville Corporation.
 - 2. Owens-Corning Fiberglass Corporation.
 - 3. Armstrong World Industries, Incorporated.
 - 4. Certainteed Corporation.

5. Knauf

B. Mastics and adhesives:

1. Childers Products Company.

2. H. B. Fuller Company, Foster Products Division.

3. 3M Company Adhesives, Coatings and Sealers.

4. Armstrong World Industries, Incorporated.

5. Ruston Plant.

6. Chicago-Mastic

7. Insul-Coustic

8. St. Clair Rubber

9. Vimasco

10. Baldwin-Ehret-Hill

C. Pipe insulation of hanger and support:

1. Pipe Shields, Inc.

2. Rilco Manufacturing Company.

3. Elcen Metal Products Company.

4. Power Piping Company.

5. NPS Industries.

D. PVC fitting covers:

1. Manville, Corporation.

2. Ceel-Co.

3. Certainteed, Corp.

4. Cell Co. Plastics

2.02 GENERAL

- A. Adhesives and insulation materials: Composite fire and smoke hazard ratings maximum 25 for flame spread and 50 for

smoke developed for pipe insulation. Adhesives to be waterproof when cured.

- B. The installation of thermal insulating materials coverings and coatings containing asbestos fibers is forbidden.
- C. Insulation shall not be chemically reactive to the metal over which it is applied. Insulation installed on steel shall be neutral or slightly alkaline. Insulation installed on aluminum shall be neutral or slightly acidic.

2.03 MATERIALS AND COMPONENTS

A. Fiberglass insulation:

1. Premolded pipe fiberglass: Recommended temperature to 850 degrees Fahrenheit with facing. Molded in one piece split or hinged circular sections in three-foot lengths for piping and tubing. Insulation shall be made from long, fine, glass fibers bonded together with a thermosetting resin. Insulation shall have a minimum density of 4.0 pounds per cubic foot and a K value as follows:

Fluid Temperature Range, Degree F	K-Value btu in/(Hr sq.ft. degree F)	Mean Rating Temperature, Degree F
Greater than 350	0.32-0.34	250
251-350	0.29-0.32	200
201-250	0.27-0.30	150
141-200	0.25-0.29	125
105-140	0.21-0.28	100
40-60	0.21-0.27	75
Below 40	0.20-0.26	50

Insulation furnished with facing as specified below and as indicated in insulation schedule. Insulation similar to Owens-Corning Type SSL-II. Pressure sensitive tapes using rubber based or acrylic based adhesives are not permitted.

2. Pipe and tank fiberglass: Recommended temperature to 450 degrees F with facing. Insulation shall be made from long, fine, glass fibers bonded together with a thermosetting resin. Insulation shall have a minimum density of 3 pounds per cubic foot and a k-value as per table for Pre-molded pipe fiberglass above. Insulation furnished with facing as specified below and as indicated in insulation schedule. Insulation

similar to Manville pipe and tank insulation. Pressure sensitive tapes using rubber based or acrylic based adhesives are not permitted.

3. Flexible fiberglass: Recommended temperature to 250 degrees Fahrenheit. Glass fibrous flexible blanket insulation having density of 0.75 pounds per cubic foot and a k-value as per table for Pre-molded pipe fiberglass above. Insulation furnished with facing as specified below and indicated in insulation schedule. Insulation and jacket similar to Owens-Corning Type SSL-II.
4. Use pipe and tank fiberglass only when premolded pipe fiberglass is not available. Pipe and tank insulation shall not be used on pipe sizes 24 inches and smaller.

B. Equipment insulation:

1. Rigid fiberglass: Recommended temperature to 450 degrees F. Fiberglass rigid board having a density of 3.0 pounds per cubic foot and a K value of 0.23 at 75 degrees F mean temperature. See schedule for facing type.
2. Flexible fiberglass: Recommended temperature to 250 degrees F with facing. Glass fibrous flexible blanket insulation having a density of 0.75 pounds per cubic foot and a K value of 0.30 at 75 degrees F mean temperature.
3. Rigid fiberglass high temperature: Recommended temperature to 850 degrees Fahrenheit. Fiberglass high temperature board having a density of 3 pounds per cubic foot and a K value of 0.30 at 200 degrees Fahrenheit mean temperature.

C. Insulation facing:

1. Code ASJ: All service jacket composed of high intensity white chemically treated Kraft paper reinforced with fiberglass yarn and mesh and laminated to aluminum foil with a fire retardant adhesive. Longitudinal laps and butt strips shall be a minimum of 3 inches.
2. Code FSKL: 0.35 mil aluminum foil reinforced with fiberglass yarn reinforcing scrim and laminated to chemically treated fire resistive Kraft paper having a minimum 35 pound per inch width tensile strength when tested in accordance with ASTM D 828. Water vapor

permeability 0.04 perms. Longitudinal laps and butt strips shall be a minimum of 3 inches.

D. Additional insulation jacket:

1. ADJ-1: Approximately 6 ounce per square yard glass cloth jacket with thread count of 5 strands per square inch.
2. ADJ-2: Approximately 2 ounce per square yard glass cloth jacket with a thread count of 10 strands by 10 strands per square inch. Jacket shall be used for covering pipe and pipe fittings.
3. ADJ-3a: 0.016 inch thick aluminum jacket conforming to ASTM B-209 with a 1 mil factory applied polykraft moisture barrier. Longitudinal joints shall be placed at the side of the pipe facing downward at either the 4 o'clock or 8 o'clock position so as to shed water. Aluminum fitting covers, two piece elbows, tees, valve and flange covers, etc., with a 1 mil polykraft or acrylic vapor barrier.
4. ADJ-3b: 0.020 inch thick aluminum jacket conforming to ASTM B-209 with a 3 mil factory applied polykraft moisture barrier. Longitudinal joints shall be placed at the side of the pipe facing downward at either the 4 o'clock or 8 o'clock position so as to shed water. Aluminum fitting covers, two piece elbows, tees, valve and flange covers, etc., with a 3 mil polykraft or acrylic vapor barrier.
5. ADJ-4: 20 mil PVC jacket suitable for all types of paint. Similar to Manville Zeston 25/50.
6. ADJ-5: shall be a Cell-Co plastic jacket with the following color coded pattern:
 - a. Condensate (Pump/Gravity): White
 - b. Other Yellow-green
7. ADJ-6 A finish jacket of an Asbestos-free and woven as high temperature, heat-resistant fabric. Lagging Cloth having a treated weight of 24 oz./sq.yd. Material shall be suitable for a sustained operation at 1100°F. Calcium silicate piping for generator exhaust piping shall also be jacketed with corrugated aluminum.

8. ADJ-7: 0.16-inch thick type T-316 stainless steel jacket. Alloys conforming to ASTM A-240. System shall have a 3-mil polykraft vapor barrier.

E. Adhesives:

1. Code ADH-1: Fibrous adhesive, non-flammable, quick setting adhesive for calcium silicate. Similar to Childers CP-97, 98.
2. Code ADH-2: Fast-drying vinyl base coating and lagging adhesive. Similar to Childers CP-50A HV2.
3. Code ADH-3: Fast-drying neoprene base adhesive for lap joints of foil-faced facing applied over pipe insulation. Similar to Childers CP-82.
4. Code ADH-4: Adhesive for use in adhering fiberglass board or blanket insulation to pipe and equipment. 3M Company Insulation Adhesive No. 35 or 38 non-flammable adhesive.

F. Caulking components:

1. Code CC-1: For use with foam glass and/or joint sealant applications. Flexible elastomeric vapor barrier sealant. Similar to Childers CP-76.

G. Mastics:

1. Code MAS-1: Vapor barrier mastic made with an elastomeric resin. For indoor use. Similar to Childers CP-30.
2. Code MAS-2: A non-water vapor barrier asphaltic emulsion coating, breathing type, for above ground installations. Similar to Childers CP-10.
3. Code MAS-3: Vapor barrier mastic made with an elastomeric resin. For outdoor use.

H. Tie wire:

1. Tie wire for securing insulation in place shall be type 304 stainless steel annealed steel wire of gauge and proper spacing as recommended by the insulation manufacturer. Wire shall be drawn up tightly enough to become embedded in the insulation and the ends of the loop twisted, bent over, and pressed into the insulation so as to leave no ends protruding.

I. Banding:

1. 3/8 inch x 0.02 inch type 304 stainless steel for pipe insulation.
2. 3/4 inch x 0.02 inch type 304 stainless steel for additional insulation jackets.

J. Wire mesh:

1. Wire mesh shall be one inch by No. 20 BGW hexagonal mesh galvanized.
2. Expanded metal: Expanded metal shall be 1/2 inch Hi-Rib metal lath of copper bearing steel.

K. Tape:

1. Lead foil tape shall be 3M Company Lead Foil Tape No. 422, 4 mil thick, acrylic adhesive, 2 inch wide.
2. Vinyl plastic tape, silver gray, flame resistant, vapor barrier sealant tape on rigid and flexible insulation material for warm or cold air ducts. Similar to 3M Company Duct Sealing Tape No. 474.
3. Aluminum foil tape, dead soft aluminum foil, point seal on stick pin, metal patching, moisture barrier, heat reflecting and general sealing on aluminum facing foil. Similar to 3M Company Aluminum Foil Tape No. 425.

L. Staples:

1. Staples shall be galvanized clad outward clinching insulation staples.

M. Insulating cement:

1. Insulating cement shall be a mineral-fiber (wool) ASTM C 195 base material having essentially the same insulating characteristics as the adjacent insulation. Similar to PABCO High Temperature Insulating Cement. Insulating cement shall be applied in layers to a maximum thickness of 1/2 inch at one time. Each layer shall be allowed to dry thoroughly before subsequent layers are applied.

N. Finishing cement:

1. Finishing cement ASTM C 449 shall be diatomaceous silica thermal insulating materials with a suitable proportion of heat resistant binder, hydraulic setting insulating cement capable of withstanding maximum temperature of 700 degrees Fahrenheit. When mixed with water it shall be a plastic mix suitable for trowel applications and shall present a hard, smooth and durable surface after drying. Similar to PABCO No. 127.
- O. Combination insulating and finishing cement:
1. Similar to Ryder One Coat or equal.
- P. Welding studs:
1. Welding studs shall be capacitor type split pin or TCP tipped insulation pins with speed clips. Similar to Nelson Stud Welding Spec. 28.

PART 3 - EXECUTION

3.01 PREPARATION

- A. No insulation shall be applied until the surfaces of the equipment to be insulated are thoroughly cleaned and until pipes and equipment to be insulated have been leak tested and proven tight and accepted by THE ENGINEER
- B. Insulation shall not be applied to piping or equipment until authorization is given to the Contractor by THE ENGINEER. Contractor shall submit a request for authorization. If any insulation is applied without first obtaining authorization, it will be the Contractor's responsibility to remove the insulation and apply it again if so directed.
- C. Ensure surface is clean and dry prior to installation. Ensure insulation is dry before and during application. Finish with systems at operating conditions.
- D. The execution of the insulation work shall be in strict accordance with the best practices of the trade and with the specifications.
- E. The insulation shall be handled and applied in a manner that will not adversely affect its structural or insulating properties.

- F. The installation instructions provided by the insulation material manufacturer of all materials specified in this Section shall be followed when installing these materials. Where the specifications are in conflict with manufacturers' instructions, such conflicts shall be brought to the attention of the ENGINEER for a decision.
- G. Welding operations will not be permitted on certain specific items of equipment, piping and components for the application of studs, pins, support rings, angles, etc. Contractor shall obtain permission in writing from THE ENGINEER to perform any welding.
- H. Coat to seal all insulating cement and calcium silicate surfaces with primer similar to Childers CP-53 or equal before applying any mastic coating.

3.02 PIPING INSULATION INSTALLATION

- A. Ensure insulation is continuous through interior walls. Pack around pipes with fire proof self-supporting insulation material, fully sealed. Insulation on all cold surfaces where vapor barrier jackets are specified must be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors, and other heat conductive parts that are secured directly to cold surfaces must be adequately insulated and vapor sealed to prevent condensation.
- B. Insulate fittings, valves, unions, flanges, and strainers. Do not insulate flexible connections and expansion joints. Terminate insulation neatly with PVC or aluminum end caps.
- C. Premolded fiberglass insulation for straight pipes shall be applied, neatly fitted around piping and sealed with adhesive ADH-3. Adhesive shall be applied to only one side of each joint and shall not be applied to the pipe surface.
- D. Where two sections of pipe insulation butt together provide a 3 inch wide butt strip of same facing material as adjacent insulation facing. Adhere neatly in place using adhesive ADH-3.
- E. All pipe elbows shall be insulated with short radial and mitered pieces of board or block insulation or premolded pieces of pipe insulation. Each piece shall be butted tightly against the adjoining piece and all joints, seams, voids and irregular surfaces shall be filled with insulating cement finished to a smooth, hard and uniform contour. Coat with MAS-1 mastic and reinforce with ADJ-2 additional jacket. In addition, place a fitted PVC cover

(ADJ-4) over insulated elbow exception. Tape elbow to adjoining insulation.

- F. All valves and fittings shall be insulated with premolded fittings, sectional pipe insulation, or blocks of the same material and thickness as used for the adjacent pipe. Flange insulation shall overlap the adjoining pipe insulation by not less than the thickness of the pipe insulation. Sectional pipe covering or block insulation shall be cut to fit, and each section butted closely to the next and held in place with tie wire.
- G. Fittings on pipe lines in finished and concealed areas shall be covered with premolded fiberglass pipe fitting insulators Insul-Coustic or equal, where sizes are available, otherwise, use mitercut segments of molded pipe insulation, wire in place with joints and raw edges sealed with adhesive and smoothed out with a coat of insulating cement.
- H. On cold pipes the fittings shall be finished with (2) coats of an approved vapor barrier mastic, reinforced with glass cloth extending 2 inches onto adjacent pipe insulation. Hot pipes shall be finished in a similar manner except the mastic need not be of the vapor barrier type.
- I. Insulation shall cover the entire surface of the fittings and bodies of the valves up to and including the bonnets, and to the valve stuffing box studs, bolts, or nuts. All joints, seams, and irregular surfaces shall be filled with insulating cement. The insulated surfaces shall be covered with a 1/4 inch thick layer of finishing cement and heavily coated with vapor barrier mastic MAS-1 for cold services and mastic MAS-2 for hot services and reinforced with ADJ-2 additional jacket. Mastic shall be trowelled to a smooth and well-shaped contour compatible with adjoining pipe insulation jackets as specified.
- J. Use ADJ-4 covers over fittings and flanges everywhere except when ADJ-3a, ADJ-3b, or ADJ-5 is specified.
- K. Repair separation of joints or cracking of insulation due to thermal movement or poor workmanship on all joints of all piping.
- L. All instrument connections for thermometers, thermocouples, gauges, test connections, flow meters, etc., on insulated pipes, vessels, or equipment shall be insulated. The insulation shall be shaped at these connections by tapering it to and around the connection with insulating cement and

finishing with finishing cement, vapor barrier adhesive, applicable mastic, or caulking compound.

- M. Where removable flange and valve insulation is required or specified, installation shall conform to the following:
1. Removable flange insulation shall be made from sectional pipe insulation of the same thickness as that on the adjoining pipe or from block insulation 1/2 inch thinner than the pipe insulation and finished with insulating cement. Insulation jackets shall be the same as adjoining pipe insulation unless indicated otherwise.
 2. When flange covers are made from sectional pipe insulation, they shall enclose the flanges and be long enough to extend at least 2 inches over the adjacent pipe insulation on each side of the flange. The space between the flange cover and the pipe insulation shall be filled with insulating cement. Secure the flange cover in place with stainless steel banding.
 3. When flange covers are made from block insulation, they shall be made in two halves. Each half shall consist of mitered blocks wired to 1/2 inch galvanized hardware cloth mesh. This wire frame, with its attached insulation, shall then be secured to the flanges with tie wire. The insulation cover shall be long enough to extend at least 2 inches over the adjacent pipe insulation on each side of the flange. The space between the flange cover and the pipe insulation shall be filled with insulating cement. The whole flange cover assembly shall be finished with 1/2 inch of insulating cement applied in two coats. After the first coat is dry, the second coat shall be trowelled to a smooth hard finish. All surfaces shall then be finished with jackets as specified in the schedule.
 4. Removable valve insulation covers shall be constructed in the same manner as for flanges with the following exception; the two part section shall be divided on the vertical center line of the valve body, bonnet, flange or joint.
 5. When specified to insulate the complete valve, the hand wheel or lug wrench shall be removed to accommodate the valve bonnet box. The valve bonnet box shall be constructed in a one piece closure, one end closed, one end opened to fit up to the valve body insulation. Securing the valve and bonnet box

sections, sealing and pointing of the insulation shall be done in same manner as specified for flange covers.

6. Unless indicated as removable, a permanent installation as previously specified shall be used.
7. Protect insulation on piping 2 ½" and up where supported in hangers by means of calcium silicate rigid pipe insulation or jackets. Saddles or shaped galvanized steel pieces approximately 10" long by half the circumferences of insulated pipe.
8. All piping shall have been tested and approved prior to installation of insulation.
9. All piping or surfaces where subject to condensation on the outside shall be insulated including vaporseal finish.

PART 4 - SCHEDULES

4.01 PIPING INSULATION SCHEDULE: (ASJ = "All-Service-Jacket")

- A. For the purpose of the following table, following are considered to be the pressure and temperature ranges:

1. Refrigerant Hot Gas - 141 - 200 Deg. F
2. Refrigeration Liquid Line, Condensation Drains - 40-60 Deg. F
3. Refrigeration Suction Line- 34- 60 Deg. F

Service	Type Insulation and Thickness (Inches)	Facing	Additional Jacket*
Refrigerant Hot Gas Up to 4" 4" & Up	Molded Fiber Glass 2 1/2 3	ASJ ASJ	
Condenser Water Up to 1-1/4" 1-1/2" & Up	Molded Fiber Glass 1 1-1/2	ASJ ASJ ASJ	
Chilled Water Up to 1-1/4" 1-1/2" & Up	Molded Fiber Glass 1 1-1/2	ASJ ASJ	
Refrigerant Liquid Line Condensation Drains Up to 1-1/4" 1-1/2" & Up	Molded Fiber Glass 1 1-1/2	ASJ ASJ	
Refrigerant Suction Line	Molded Fiber Glass	ASJ	ADJ-3b

Service	Type Insulation and Thickness (Inches)	Facing	Additional Jacket*
	3"		
All outdoor piping	Two times thickness scheduled except heat traced		ADJ-3b
All pipe within equipment room with chillers or boilers plant	As scheduled		ADJ-5
Others not scheduled	Molded Fiber Glass 2	ASJ	

*Including elbows, fittings, valves, complete system.

1. Refer to jacket specifications for finish covering to be installed on calcium silicate insulation in finished areas.
2. Where "Finishing Cement" finishes are scheduled, refer to specifications for Cement herein for materials, method of application, thickness, etc.
3. Provide vapor barrier on all cold water and rainwater piping.
4. Piping exposed to weather shall be insulated with pipe insulation using double the thicknesses scheduled hereinbefore, up to 24 inches beyond the point where pipes enter the building. Provide weatherproof jacket as hereinafter specified.
5. Equipment drains and floor drains from cooling coils as well as drinking fountain waste shall be insulated 6 feet downstream from connection point.

END OF SECTION 230719

SECTION 230800 - COMMISSIONING OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.
- B. An independent Commissioning Agent (CxA) shall be hired by the contractor at his expense.
- C. The CxA shall report to the owner.

1.2 CONTRACTOR'S RESPONSIBILITIES

- A. Perform commissioning tests at the direction of the CxA.
- B. Attend construction phase controls coordination meeting.
- C. Attend testing, adjusting, and balancing review and coordination meeting.
- D. Participate in HVAC&R systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.
- E. Provide information requested by the CxA for final commissioning documentation.
- F. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.

1.3 CxA'S RESPONSIBILITIES

- A. Provide Project-specific construction checklists and commissioning process test procedures for actual HVAC&R systems, assemblies, equipment, and components to be furnished and installed as part of the construction contract.
- B. Direct commissioning testing.
- C. Verify testing, adjusting, and balancing of Work are complete.
- D. Provide test data, inspection reports, and certificates in Systems Manual.

1.4 COMMISSIONING DOCUMENTATION

- A. Provide the following information to the CxA for inclusion in the commissioning plan:
 - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports.
 - 2. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.
 - 3. Process and schedule for completing construction checklists and manufacturer's prestart and startup checklists for HVAC&R systems, assemblies, equipment, and components to be verified and tested.
 - 4. Certificate of readiness, signed by the Contractor, certifying that HVAC&R systems, assemblies, equipment, components, and associated controls are ready for testing.
 - 5. Certificate of completion certifying that installation, prestart checks, and startup procedures have been completed.
 - 6. Certificate of readiness certifying that HVAC&R systems, subsystems, equipment, and associated controls are ready for testing.
 - 7. Test and inspection reports and certificates.
 - 8. Corrective action documents.
 - 9. Verification of testing, adjusting, and balancing reports.

1.5 SUBMITTALS

- A. Certificates of readiness.
- B. Certificates of completion of installation, prestart, and startup activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING PREPARATION

- A. Certify that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according

to the Contract Documents, and that pretest set points have been recorded.

- C. Certify that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.2 TESTING AND BALANCING VERIFICATION

- A. Prior to performance of testing and balancing Work, provide copies of reports, sample forms, checklists, and certificates to the CxA.
- B. Notify the CxA at least 10 days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
 - 1. The CxA will notify testing and balancing Subcontractor 10 days in advance of the date of field verification. Notice will not include data points to be verified.
 - 2. The testing and balancing Subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
 - 3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.

4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.3 GENERAL TESTING REQUIREMENTS

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of HVAC&R testing shall include entire HVAC&R installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA along with the HVAC&R Contractor, testing and balancing Subcontractor, and HVAC&R Instrumentation and Control Subcontractor shall prepare detailed testing plans, procedures, and checklists for HVAC&R systems, subsystems, and equipment.
- E. Tests will be performed using design conditions whenever possible.
- F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
- G. The CxA may direct that set points be altered when simulating conditions is not practical.
- H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.
- I. If tests cannot be completed because of a deficiency outside the scope of the HVAC&R system, document the deficiency and report it to the Owner. After deficiencies are resolved, reschedule tests.
- J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.4 HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. HVAC&R Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.
- B. Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment requirements are specified in Division 23 piping Sections. HVAC&R Contractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:
 - 1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
 - 2. Description of equipment for flushing operations.
 - 3. Minimum flushing water velocity.
 - 4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.
- C. Refrigeration System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of refrigerant compressors, condensers and other refrigeration systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.
- D. HVAC&R Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air and hydronic distribution systems; special exhaust; and other distribution systems, including HVAC&R terminal equipment and unitary equipment.
- E. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- F. Systems shall include all systems as indicated in Section 230593 "Testing and Balancing For HVAC Systems".

END OF SECTION 230800

SECTION 230900- DIRECT DIGITAL/AUTOMATIC TEMPERATURE CONTROLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Disconnect existing Roof Top Unit from existing BMS system and reconnect replaced Roof Top Unit to existing BMS system.
- B. All system components shall be installed in accordance with local and State codes.
- C. Secure all permits and local/State approval for all components and installation as specified under this Section.
- D. Provide complete commissioning for all control system components and sequences of operation.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- B. Section 23 09 93 - Sequence of Operations
- C. Section 23 74 05 - Rooftop Air Conditioning Unit

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. NFPA 70 - National Electric Code.

2. UL-916 - Energy Management Systems.
3. UL-873 - Temperature Indication and Regulating Equipment.
4. FCC; Part 15, Subpart J - Class A computing Equipment.
5. UL-864 - Fire and Smoke Control.

1.05 SYSTEM DESCRIPTION

- A. Connect to existing Carrier BACNET Building Management System (BMS). Provide all required software modification and other accessory equipment, along with any electrical control wiring, and software generation to fill the intent of the specifications and provide for a complete and operable system.
- B. The control systems shall be modified by competent control mechanics and electricians regularly employed by the manufacturer of the control equipment. All control equipment shall be the product of one (1) manufacturer and all components shall be capable of interfacing with the HVAC equipment.
- C. All products shall be labeled with the appropriate approval markings. System installation shall comply with NFPA, NEMA, Local and National Codes.
- D. Contractor shall hire Carrier Controls as part of the project to procure the compatible controls components to that existing as well as to program the existing control system for the project.

1.06 SUBMITTALS

- A. See Section 230500 and General Conditions for additional requirements.
- B. Product Data: Provide data for system component and software module.
- C. Manufacturer's Installation Instructions: Indicate manufacturer's installation instructions for all manufactured components.
- D. Project Record Documents: Record actual locations of control components, including control units, thermostats and sensors, junction boxes, transformers, box addresser.

230900 DIRECT DIGITAL/AUTOMATIC TEMPERATURE CONTROLS

1. Revise shop drawings to reflect actual installation and operating sequences.
2. Include submittal data in final "Record Documents" form.
3. All start-up/checkout documentation shall be initial and signed by the on-site control technician with intimate knowledge of the project.
4. Provide start-up/checkout documentations for DDC controllers connected to the existing BMS network. Documentation shall include all controller points used and unused (spare). Furthermore, all final settings, calibration, coefficient valves, K factors, spanning, actual spring ranges, etc., shall be indicated for all active points in use.
5. Revise all control sequence for all controlled sequences for operation. Sequence of operation that restate the Design Engineer's sequences will not be acceptable. Complete details will be given within the sequences of operation provided by the Contractor. Details shall include but not limited to the following items control strategy, timers, delays, logic sequencing, start/stop, end devices involved, sensors involved, set points, globally commanded valves, shared data between panels and controllers.

E. Operations and Maintenance Data:

1. Include interconnection wiring diagrams complete field installed systems with identified and numbered, system components and devices.
2. Include keyboard illustrations and step-by-step procedures indexed for each operator function.
3. Include inspection period, cleaning methods, cleaning materials recommended and calibration tolerances.

1.07 QUALITY ASSURANCE

- A. Perform work in accordance with NFPA 70 and Divisions 26, 27 and 28 specifications.
- B. Design system software under direct supervision of a Professional Engineer experienced in design of this Work

and licensed within the State in which the project is located.

- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years of documented experience.
- D. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum ten (10) years of documented experience and approved by manufacturer.
- E. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. and testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.08 WARRANTY

- A. See Section 230500 and General Conditions for additional requirements.
- B. The system specified herein and shown on the drawings shall be guaranteed to be free from original defects in both material and workmanship for a period of twelve (12) months of normal use and service, excepting damages from other causes. This guarantee shall become effective starting the date the Contract work is accepted as complete by the Owner and in accordance with the General Provisions/Conditions.
- C. Provide five (5) year manufacturer's warranty for field programmable micro-processor based units.
- D. Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.11 GENERAL

- A. Acceptable manufactures subject to compliance with the specifications
 - 1. Carrier Corporation. See para. 1.05D above.
- B. All electrical work shall comply with Divisions 26 Specifications.

PART 2 - PRODUCTS

230900 DIRECT DIGITAL/AUTOMATIC TEMPERATURE CONTROLS

2.01 ELECTRIC LOW VOLTAGE WIRING

- A. Furnish all labor and material to install the necessary wiring to accomplish the successful and complete operation of the new automatic system (DDC).
- B. All electric wiring, wiring connections and all interlocking required for the installation of the temperature control system, as herein specified, shall be provided by the Contractor, unless specifically shown on the Electrical drawings or called for in the Electrical specifications.
- C. Furnish all labor and material to install necessary relays, general purpose enclosures and appurtenances to control designated devices relative to the DDC.
- D. All wiring throughout shall be concealed where possible.
- E. All conduit used shall be IMC, 3/4" minimum size or larger. Conduit sizes shall be large enough to permit the individual conductors to be readily installed or withdrawn without damage to the conductors or their insulation. Splicing of wires will be permitted only in junction boxes or pull boxes. Conduit shall be rigid up to 12'-0" AFF in mechanical rooms.
- F. Conduit shall never to be relied upon for a fault current and safety ground return conductor.
- G. The ground system shall not be used as a current carrying conductor except for faults and noise suppression. The grounding system shall be used to control noise and transients which might affect the operation of the automation system. As such, the ground requirements shall be in excess of a grounding system used solely for physical protection minimum (Code requirement).
- H. In all cases, the bond to ground shall be as short as possible. A ground point shall be derated by one (1) point (in order of preference) for each 50'-0" of conductor run between it and the automation equipment to be grounded. Therefore, a water pipe bond located 10'-0" away will be preferable to a structural steel bond located 150'-0" away.
- I. Set screw connectors shall be galvanized or plated steel. White metal cast type will not be permitted.

- J. Flexible conduit shall be used at field devices, i.e., pressure switches, flow switches, temperature devices, etc. Convolutions shall be steel, interlocked continuously. Aluminum will not be permitted. "Liquidtight" shall be used in wet locations. Flexible connector shall be a minimum of 18" long.
- K. Only core drilling is permitted to pierce the floors in the electrical closets and elsewhere. The use of water for drilling shall be controlled by a suitable vacuum system, using proper dams to prevent damage to floors below. The ATC Contractor shall be responsible for providing a suitable sleeve in all core drilled holes as specified herein.
- L. All wiring shall be run in IMC and as noted below:
1. Sensor to Panel (Block Wall): In Wall
 2. Sensor to Panel (Stud Wall): In New Conduit (IMC)
 3. Sensor to Panel (Mechanical Room): In New Conduit (IMC)
 4. Panel to Front End Workstation: In New Conduit (IMC)
 5. Front End: In New Conduit (IMC)
- M. Wiring
1. Type THHN solid #18 AWG for control wiring in dry location up to 194°F.
 2. Type THWN in wet location up to 167°F (solid #18 AWG).
 3. Twisted shielded pair (18 gauge), with PVC cover, Belden #8760 or approved equal.
 4. Conduit is not considered as a shield.
 5. All wiring associated with the control signals to the smoke damper control/sequence must be in approved conduit.
 6. All signal wiring to all field devices shall be run with no splices, separately from any wiring having voltage greater than 30 volts.

- N. The Contractor shall install all shielded cable and ground systems in accordance with Division 23. The installation of ground loops shall not affect any sensing or control circuits.
- O. All devices and equipment shall be mounted in minimum NEMA 1 enclosures.
- P. In addition to the requirements specified above, all communication wiring cables shall include a minimum of (1) individually 100% shielded pair ([2] conductors) as unused spare conductors. Where the number of conductors and specific cable specified above for each type of communication wiring will not meet this requirement for spare conductors, Contractor shall provide approved equivalent product of Belden or other manufacturer with the necessary number of conductors and which meets the requirements specified above.
- Q. Low Voltage Control Wiring
1. All Control components including damper motors, valve actuators, and all other control components shall operate on 24-volt power, unless 120-volt power is provided specifically by the electric trade, and the control components are accepted by the owner for 120-volt power. Any and all items not shown on electrical drawings on 120-volt power shall be provided with 24-volt power components.
 2. The contractor shall provide all required step-down transformers as required based upon allowable voltage drops. Obtain power for the control devices from the nearest electrical panel in the Electrical Closet located in the project scope area unless specific panel locations are shown on electric al drawings.
 3. Low voltage control wiring shall be minimum 16 gauge, or heavier if required, twisted pair, 100% shielded with PVC cover Belden #9316 or approved equivalent product of other manufacturers run in conduit with no splices, separate from any wiring above 30 volts.
- R. Coordination of Interfacing/Interlocking
1. The Contractor shall be responsible for coordinating all required interface/interlocking software, software logic, sequencing and wiring necessary to provide a fully automated and fully functional operable system

to met or exceed the intent of the Design Engineer's Sequence of Operation. Coordination may include but not limited to the following at no additional cost to the Owner. Variable frequency drive (VFD) interlocking and wiring logic including software, relays factory/field installed wiring and/or VFD drive modifications. This would include coordination of miscellaneous points as specified under point list in this specification. Systems to include all points analog, digital, pneumatic sensors wiring, software, wiring, communications gateways, etc., to connect and communicate to existing BMS systems.

PART 3 - EXECUTION

3.01 PROJECT MANAGEMENT

- A. The ATC Contractor shall designate a project manager who will be responsible for the following:
 - 1. Construct and maintain project schedule.
 - 2. On-site coordination with all applicable trades and subcontractors.
 - 3. Authorized to accept and execute orders or instructions from Owner/Architect.
 - 4. Attend project meetings as necessary to avoid conflicts and delays.
 - 5. Make necessary field decisions relating to this scope of work.
 - 6. Coordination/Single point of contact.

3.02 NUMBERING/NAMING CONVENTIONS

- A. The Contractor shall collaborate with the Owner directly to determine the Owner's preference for naming conventions, etc. before entering the data in the system.
- B. As a minimum the ATC Contractor shall submit to the Architect/Engineer and Owner the layout of the network, identifying all DDC controllers. Each controller will be identified by address and system being served. All physical and software generated objects, points and attributes shall be listed along with a description.

3.03 START-UP AND COMMISSIONING

- A. Provide any recommendation for system modification in writing to Owner. Do not make any system modification, including operating parameters and control settings, without prior approval of Owner.
- B. The ATC Contractor will provide industry standard checkout and startup checklists for each DDC controller installed for the project. If not standard is available, the ATC Contractor shall develop a spreadsheet in MS Excel format and submit to the Engineer for approval prior to system checkout.

3.04 INSTRUCTION AND ADJUSTMENT

- A. Upon completion of the project, the Contractor shall:
 - 1. Completely adjust and make ready for use, all transmitters, relays, damper operators, valves, etc., provided under this Section. This Contractor shall furnish copies of complete, detailed, calibrating checkout and commissioning documentation for each controller. Documentation shall list each procedure and shall be signed by the control specialist performing the service.

END OF SECTION 230900

SECTION 230930 - SCHEDULES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install temperature controls.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 SUBMITTALS

- A. See Section 230500 and General Conditions for Additional Requirements.
- B. Product Data: Provide data for duct materials.
- C. Prepare and submit scaled coordination drawings.
- D. Manufacturer's Installation Instructions.

1.05 QUALITY ASSURANCE

- A. See Section 230500.

PART 2 - PRODUCTS

2.01 POINT SCHEDULE

- A. Note: For point software association, see sequence of operation. All points shall be able to integrate to all trends, totalizations, etc., as applicable. For additional points, refer to PID drawings and sequences of operations. Additional points not specifically called for herein but required to perform the sequence as herein specified shall be provided at no additional cost to the Owner.

- B. The points shall include those include herein and any others indicated in contract drawings.

SYSTEM POINT	POINT				ALARMS			COMMENTS
	A I	AO	D I	DO	H I	LOW	OFF NORMAL	
TYPICAL FOR AHU-								
START/STOP SUPPLY FAN #1				X			X	
SUPPLY FAN #1 STATUS	2				2	2		VIA AMPERAGE SENSOR & DIFF. PRESSURE SENSOR
SUPPLY FANS HIGH STATIC SAFETY			2		X		X	VIA DELTA P SWITCH
OUTSIDE AIR INTAKE DAMPER			2	X				OPEN/CLOSE, WITH END SWITCHES
SUPPLY FAN #1 ISOLATION DAMPER			2	X				OPEN/CLOSE, WITH END SWITCHES
COOLING COIL LEAVING AIR TEMP.	X				X	X		
UNIT SUPPLY DISCHARGE TEMP.	X				X	X		
OUTSIDE AIR TEMP.	X							
MODULATE COOLING COIL VALVE	X	X						PROVIDE VALVE POSITION FEEDBACK
FREEZE THERMOSTATS (AT COOLING COIL)			X				X	
OUTSIDE AIR HUMIDITY AND TEMPERATURE	2							
SUPPLY SYSTEM STATIC PRESSURE (IN DUCTWORK)	X							
SUPPLY UNIT PREFILTER ▲P	X				X	X		
SUPPLY UNIT AFTER FILTER ▲P	X				X	X		
DISCHARGE HUMIDITY	X							REPLACEABLE RH SENSOR TIPS
EXHAUST RELATIVE HUMIDITY	X				X	X		LOCATED EACH AT EAHU INTAKE PLENUM, PROVIDE AVERAGING FOR BUILDING SENSING
HUMIDITY HIGH LIMIT SENSOR AT UNIT	X	X			X		X	RESET MAXIMUM HUMIDIFIER OUTPUT VIA THIS SENSOR
SUPPLY AIR SMOKE DETECTOR		X					X	EACH AHU
SUPPLY FANS AIR VOLUME (FMS)	2							EACH AHU, 2, FAN FMSs/UNIT

PART 3 - EXECUTION

- A. Provide any other points required by the Sequences or other items specified in Division 23.
- B. Provide any additional points required for systems to function correctly.

END OF SECTION 230930

SECTION 230993 - SEQUENCES OF OPERATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install temperature controls.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 SUBMITTALS

- A. See Section 230500 and General Conditions for Additional Requirements.
- B. Product Data: Provide data for duct materials.
- C. Prepare and submit sequences and drawings.
- D. Manufacturer's Installation Instructions.

1.05 QUALITY ASSURANCE

- A. All sequences shall be made functional.

1.06 MANUFACTURERS TO BE USED FOR THE PROJECT

PART 2 - PRODUCTS

2.01 GENERAL

- A. NOTE: THIS IS A PARTIAL LISTING OF SEQUENCES.
- B. Sequences

230993 SEQUENCES OF OPERATION

1. Roof Top Units
2. Exhaust Air Fans
3. Split Type Air Conditioning Units

2.02 Roof Top Units.

- A. See Section 23 74 05 for sequence of operation of Roof Top Units.

2.03 EXHAUST AIR FANS/SUPPLY AIR FANS

- A. For all exhaust fans, which are not located in AHU's or EAHU's, furnish for installation by the Contractor, interlock fans with manual on/off switch and programmable time clock, similar to Intermatic 1125C or approved equal in room served. Provide electric and control power to the programmable time clock for interlocks with the fan.

2.04 SPLIT TYPE AIR CONDITONING UNITS

- A. For all condensers/condensing units being temporarily displaced in the project, the reinstalled condenser/condensing units shall be provided with new control wiring from the outdoor equipment to the outdoor equipment and interlocked with the evaporator unit (for condensing units), with the compressor/evaporator unit (for condensers) for energizing the outdoor unit whenever the system calls for cooling as directed by the existing BMS system serving the Air Conditioning System.

END OF SECTION 230993

SECTION 232000 - HVAC PIPING AND JOINTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all steam and condensate piping, fittings, flanges, unions, bolting, gaskets, welding, and threading for all main piping network, branches and connections to all fuel fired HVAC and electrical equipment and systems to make complete and operations systems.
- B. All systems shall be installed in accordance with local code including vent piping and relief discharge termination points.
- C. Secure all permits and local/state approvals for the installation of all components included under this Section.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. ASME: American Society of Mechanical Engineers
- C. NFPA: National Fire Protection Association
 - 1. NFPA 54: National Fuel Gas Code
- D. ANSI: American National Standards Institute
 - 1. A13.1: Scheme for Identification of Piping Systems
 - 2. B16.1: Cast Iron Pipe Flanges and Flanged Fittings

3. B16.3: Malleable Iron Threaded Fittings
 4. B16.4: Cast Iron Threaded Fittings
 5. B16.5: Pipe Flanges and Flanged Fittings
 6. B16.9: Factory Made Wrought Steel Butt Weld Fittings
 7. B16.11: Forged Steel Fittings, Socket Weld and Threaded
 8. B16.15: Cast Bronze Threaded Fittings
 9. B16.18: Cast Copper Alloy Solder Joint Pressure Fittings
 10. B16.20: Metallic Gaskets for Pipe Flanges
 11. B16.21: Non Metallic Flat Gaskets for Pipe Flanges
 12. B16.22: Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
 13. B16.24: Cast Copper Alloy Pipe Flanges and Flanged Fittings Class 150, 300, 400, 600, 800, 1500 and 2500
 14. B182.1 Square and hex bolts and screws
 15. B182.2 Square and hex nuts
 16. B16.39: Malleable Iron Threaded Pipe Unions
 17. B16.42: Ductile Iron Pipe Flanges and Flanged Fittings
 18. B31.1: Power Piping
 19. B36.10: Welded and Seamless Wrought Steel Pipe
 20. Z49.1: Safety in Welding and Cutting
- E. AWWA: American Waterworks Association
1. C104/A21.4: Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
 2. C110/A21.10: Ductile Iron and Gray Iron Fittings for Water

3. C111/A21.11: Rubber Gasket Joints for Ductile Iron Pipe and Threaded Flanged
 4. C151/A21.51: Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand Lined Molds, for Water or Other Liquids
 5. C153/A21.53: Ductile Iron Compact Fittings, 3" thru 6", for Water and Other Liquids
 6. C200: Steel Water Pipe 6" and Larger
 7. C205: Cement Mortar Protective Lining and Coating for Steel Water Pipe
 8. C206: Field Welding of Steel Water Pipe
 9. C207: Steel Pipe Flanges for Waterworks
 10. C208: Dimensions For Fabricated Steel Water Pipe Fittings
 11. C600: Standard for Installation of Ductile Iron Water Mains and Their Appurtenances
 12. C606: Standard for Grooved and Shouldered Joints
 13. C210: Liquid Epoxy Coating System for the Interior and Exterior of Steel Water Pipes
- F. CISPI: Cast-Iron Soil Pipe Institute
1. 301: Hubless Cast Iron Sanitary System: With No-Hub Pipe and Fittings
- G. ASTM: American Society for Testing and Materials
1. A 47: Ferritic Malleable Iron Castings
 2. A 53: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 3. A 74: Cast Iron Soil Pipe and Fittings
 4. A 105/A105M: Forgings, Carbon Steel, for Piping Components
 5. A 106: Seamless Carbon Steel Pipe for High-Temperature Service

6. A 135: Electric-Resistance-Welded Steel Pipe
7. A 153: Zinc Coating (Hot Dip) on Iron and Steel Hardware
8. A 183: Carbon Steel Track Bolts and Nuts
9. A193: Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
10. A194: Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
11. A197: Cupola Malleable Iron
12. A 234/A23AM: Pipe Fittings of Wrought Carbon Steel and Alloy / Rev A: Steel for Moderate and Elevated Temperature
13. A 307: Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength
14. A 312: Standard for Seamless and Welded Austenitic Stainless Steel Pipe.
15. A 536: Ductile Iron Castings
16. A 568: Steel, Sheet Carbon and High-Strength Low-Alloy / Rev A: Hot-Rolled and Cold-Rolled, General Requirements
17. A 795: Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
18. B 32: Solder Metal
19. B 43: Seamless Red Brass Pipe, Standard Sizes
20. B 75: Seamless Copper Tube
21. B 88: Seamless Copper Water Tube
22. C 564: Rubber Gaskets for Cast Iron Soil Pipe and Fittings
23. D 2000: Standard Classification System for Rubber Products in Automotive Application
24. F 36: Compressibility and Recovery of Gasket Materials

- 25. F 37: Sealability of Gasket Material
- 26. F 38: Creep Relaxation of a Gasket Material
- 27. F 146: Fluid Resistance of Gasket Materials
- 28. F 104: Non-metallic Gasket Materials
- 29. F 152: Tension Testing of Nonmetallic Gasket Materials
- 30. C 33: Standard Specification for Concrete Aggregates
- 31. D-2122: Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- 32. D-2513: Standard Specification for Thermoplastic Gas Pressure / Rev. B: Pipe, Tubing and Fittings
- 33. D-1248: Standard Specification for Polyethylene Plastic Molding and Extrusion Materials
- 34. D-3350: Polyethylene Plastic Pipe and Fittings Materials

H. Copper Development Association

1.05 SUBMITTALS

- A. See Section 232000 and General Conditions for additional information.
- B. Product Data: Include data on pipe materials, steam/condensate specialties, pipe fittings and accessories. Provide manufacturers catalogue information and mill certificates.
- C. Welders Certificate: Include welder's certification of compliance with ASME (BPV IX).
- D. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
- E. Project Record Documents: Record actual locations of all piping, valves, traps and valve tag numbers.
- F. Grooved joint couplings and fittings shall be shown on drawings and product submittals and shall be specifically identified with the applicable designation.

- G. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- H. Provide piping plans to a minimum scale of $\frac{1}{4}$ " - 1'-0".

1.06 QUALITY ASSURANCE

- A. Installer: Company specializing in performing work of the type specified in this section, with documented experience.
- B. All grooved joint couplings, fittings, valves, and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components.
- C. Welders: Certify in accordance with ASME (BPV IX).

1.07 REGULATORY REQUIREMENTS

- A. Conform to ASME B31.9 code for installation of steam and condensate piping systems including specialties.
- B. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.
- C. Provide certificate of compliance from authority having jurisdiction, indicating approval of welders.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Protect piping systems and specialties from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.09 ENVIRONMENTAL

- A. Do not install piping when environmental conditions are outside the specific limitations of the referenced codes and manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide all piping, fittings, flanges, couplings, unions, bolting, gaskets, welding, threading and soldering for main piping network, branches and connections to equipment as shown on the drawings and as required to provide complete systems. All piping, fittings and accessories shall

conform to the appropriate Service Pipe Schedule as specified hereinafter.

1. Acceptable manufacturers contingent on compliance with the specifications.

- a. Pipe

- a) Cambridge Lee
 - b) Cerro

B. General [Edit as applicable]

1. All pipe and fitting shall be new, first quality material suitable for continuous operation under the conditions specified. All material shall be in conformance with ANSI Standards.
2. All pipe shall be a product of the United States of America. Mill certificate shall be provided as required.
3. All piping shall be clearly marked with material specification.
4. All pipe and material shall comply with the requirements and recommended practices of ASME B31.1 Power Piping Code (latest Edition and Addenda).
5. Elbows shall be long radius ANSI B16.9 unless otherwise specified.
6. Fittings shall be used at all branch connections from headers.
7. Acceptable fittings shall be tees. "Weldolets", "Threadolets" and "Sockolets" will also be allowed as specified. Fishmouth or shaped nipples will not be allowed.
8. Provide drains at low points and vents at high points of all piping systems and between pumps and check valves.
9. Steam pipes shall be provided with drip legs and traps at all low points and as otherwise specified.
10. Steam service as specified herein shall include steam trap piping to and including shut-off valve on trap discharge and relief valve discharge.

11. Condensate service shall start at the connection to the main valve where the branch to the steam trap starts.
12. Lubricants used for the installation of grooved couplings shall be approved by the coupling manufacturer.
13. All pipe and fittings with threaded ends shall have IPS threads cut clean and true and in conformance with the ANSI B1.20.1.
14. Threaded pipe and fittings shall be made up with special care to avoid marring or damaging pipe and fitting surfaces.
15. All threaded joints in steel and iron pipe shall be made up with pipe thread compound or other compound suitable for design temperature and pressure of piping. All threaded joints in copper pipe shall be made up with Teflon pipe tape, petroleum gas grade, wound on male threads, clockwise as viewed from end of pipe.
16. Provide high temperature brass, bronze steel or cast ductile iron (as appropriate) dielectric unions or flanges between dissimilar pipe materials to prevent galvanic action, as required. Gaskets shall be suitable for operation up to design temperature of the piping.
17. No joints shall be "backed-off" to align pipe and fittings.
18. Gauge lines shall be stainless steel with compression fittings.
19. Piping for compressed air for controls shall be copper.
20. Use "Never-Freeze" Copper Anti-Seize by Frederickseal or similar on all flange bolts. Torque all bolts to suitable values using torque wrenches.
21. All condensate piping and steam piping in inaccessible shafts, trenches, or tunnels shall be socket weld 2" and below.

2.02 SERVICE PIPE SCHEDULE

Service	Type	Grade	Wall		Joints (Minimum Sch. Shall match Wall)	
			to 10"	12" & Up	2" and Less	2½" & Up
Miscellaneous drains to 2"	Hard Drawn Copper	ASTM B88	Type L		DWV 95-5 Solder	
Refrigerant relief for all other units	Hard Drawn Copper	ASTM B88	Type L		Silver Brazed	Silver Brazed
Refrigerant relief for centrifugal chillers	A106 or A53 Seamless or ERW	A or B	Sch.40	Standard 0.375"	Threaded Malleable	Butt Welded
Refrigerant system	Hard Drawn Copper ACR	ASTM B280	Type L		Silver Brazed	Silver Brazed

2.03 FITTINGS

A. For Copper Tubing

1. Solder Joint: Wrought Copper, ANSI B16.22 or Cast Bronze B16.18.
 - a. 2" and less
 - 1) Silver brazing alloy.
 - b. 2½" and larger
 - 1) Silver brazing alloy.
 - a) For refrigerant piping and where noted: Silver brazing alloy, similar to Handy and Harman Easy-Flo.
2. Compression and Flared Fittings: Cast brass, ANSI B16.26.

2.04 FLANGES

A. For Copper Tube

1. Grooved Joint Flange Adapters
 - a. Ductile iron coated with copper-colored alkyd enamel, flat face, for direct connection to ANSI Class 125 and 150 flanges. Victaulic Style 641.

2.05 FLANGE GASKETS

- A. One-piece ring type 1/16" thick, except as noted.
- B. Suitable for temperature, pressure and service of system.
- C. Compressed compound fiber type for the following:
 - 1. Low pressure steam and condensate return and pumped discharge.
 - 2. Hot water.
 - 3. Cold water.
- D. For Joints of Dissimilar Metals
 - 1. Isolating gaskets, sleeves, and washers between flanges, bolts and nuts.
 - 2. Gaskets, similar to DuPont Teflon.

2.06 UNIONS

- A. For Red Brass Pipe
 - 1. All bronze, 150 lb. wsp, ground joint seat.

PART 3 - INSTALLATION

3.01 PIPING INSTALLATION

- A. Provide all piping systems as shown on the drawings and otherwise required to make a complete, workable and neat job, installing all valves, appurtenances, grooved joint couplings, unions and gaskets. The Contractor shall use care arranging all piping as shown on the drawings and shall carefully examine the arrangements where offsets are indicated and shall follow details as shown.
- B. All piping shall be run to true alignment generally parallel or perpendicular to adjacent building walls, floors and ceilings and with uniform grades and spacing so as to present a neat and workmanlike appearance.
- C. Care shall be paid to the exact locations for all piping and equipment with respect to equipment, ducts, conduits, slabs, beams and lighting fixtures, so as to provide maximum access to all mechanical and electrical equipment in the buildings. Close coordination and cooperation shall be exercised with other Trades in locating the piping and equipment in the best interests of the Owner. The drawings

and specifications covering other work to be done in the buildings shall be carefully studied and arrangements made to avoid conflict.

- D. The drawings shall be followed where they are definite and provided such procedure causes no objectionable conditions or does not conflict with other Trades, Laws, Regulations or recommendations of equipment manufacturers. The drawings are intended to indicate the sizes of piping connections and if certain sizes are omitted, or unclear, obtain additional information before proceeding.
- E. Rough in for all equipment requiring connections to the Mechanical work. Obtain all necessary data on exact locations, sizes, connections, fittings and arrangements and exact routings as may be required for proper installation.
- F. Bushings shall not be used for reducers. Reducing fittings shall be used for all changes in pipe size and shall be as follows:
 - 1. Horizontal water piping: Eccentric flat on top for venting.
 - 2. Horizontal steam and condensate piping: Eccentric flat on bottom for drainage.
 - 3. Vertical water or steam: Concentric.
- G. Unions, grooved joint couplings or flanges shall be provided in conjunction with all equipment, coils, control valves and specialties in all pipe lines and at all points necessary to provide reasonable access to the piping systems.
- H. Ends of all pipes shall be reamed clean and all pipes shall be straightened before erection and measures shall be taken to preserve this cleanliness after erection.
- I. Support piping independently at all equipment so that the equipment is not stressed by piping weight or expansion.
- J. Arrange piping for maximum accessibility for maintenance and repair, locate valves for easy access and operation.
- K. Provide dielectric unions, waterway fittings or flanges between dissimilar pipe materials to prevent galvanic action as required.

- L. Provide proper provision for expansion and contraction in all portions of pipe work, to prevent undue strains on piping or apparatus connected. Provide double swings at riser transfers and other offsets to take up expansion. Arrange riser branches to take up motion of riser. Branch runouts to equipment shall have a minimum of (3) elbows, adequately spaced.
- M. All piping connections to equipment shall be made with offsets. Provide with unions, grooved joint couplings and/or flanges so arranged that the equipment can be serviced or removed without dismantling the piping. If equipment, when commissioned, becomes air bound or stratified, all necessary modifications to the piping system required to rectify the condition permanently shall be made to piping and equipment, furring, floors, walls, etc., at the Contractor's expense.
- N. Pipe pitch, unless otherwise indicated on the drawings, shall be as follows:
 - 1. Condensation Drainage:
 - a. Preferred: 1/4 in./ft., down in direction of flow.
 - b. Minimum: 1/8 in./ft., down in direction of flow.
- O. Copper tubing and galvanized steel shall not be mixed in any one run of piping, except as otherwise specified herein.
- P. During construction, temporarily close open ends of pipes with sheet metal caps or duct tape to prevent debris from entering piping systems.
- Q. Where condensate piping, to meet job conditions, may have to set down under stoops, doors, etc., and again rise after passing these, the sets shall be made with 45° fittings and with Y-laterals at each end, with brass plugs to permit easy cleaning of trapped portions of pipe. At any points where return mains have to rise again, after being depressed, provide overhead "air lines" (not smaller than 1" in size) and connect the (2) high sides. Any turns in water sealed lines shall be made with crosses, with brass plugs in unused outlets to facilitate cleaning.
- R. Joints in piping systems, for all services, shall be made tight and leakproof against test pressures. Leaks in screwed or flanged joints which cannot be eliminated by normal wrench tightening methods shall be repaired at the

joint. Under no circumstances shall caulking be allowed. No joints shall be backed off to align pipe fittings.

S. Refrigerant Piping and Connections

1. Provide all refrigeration piping, including thermal expansion valves, driers, moisture indicator sight glasses, shutoff valves, controls, gauges, insulation and other appurtenances, as required to complete the refrigeration system. Piping connections to the units shall be fitted with flexible pipe fittings and renewable unions.
2. The HVAC Contractor shall triple evacuate and field charge entire refrigeration system. All labor and materials required for evacuation, charging, as well as commissioning of the refrigerant systems, shall be provided by the HVAC Contractor. The refrigerant piping arrangement shall be in strict accordance with manufacturer's recommendations. Provide shop drawings indicating sizes and all required components and accessories for Architect's review prior to ordering equipment or installation.
3. All refrigerant piping exposed to weather outside the building shall be properly supported in a manner to allow expansion and contraction. All sleepers provided shall be secured and their installation shall be as directed and approved by the Architect.
4. Refrigerant piping joints shall be made with cadmium free 45% silver brazing filler metal having a melting point of 1225°F. Joint flux, if used, shall be compatible with materials. The outside surface at end of pipe and inside surface of fittings shall be thoroughly cleaned with steel wool or emery cloth, and cut pipe ends shall be reamed and all burrs shall be removed. Care shall be taken to ensure the entry of foreign particles into the system does not occur. While brazing, purge piping with low pressure nitrogen to prevent interior oxidation and to dry the system. Caution must be taken to continuously ventilate the work area and to avoid allowing nitrogen to concentrate in an enclosed area thereby expelling all of the oxygen and causing asphyxiation.
5. Traps shall be factory fabricated one-piece fittings or field assembled 45°-90°-45° elbows. Do not use 90°-90°-90° elbows.

3.02 CLEANING AND BLOWING OUT

- A. The equipment and piping installed under this Section shall be blown out under pressure and cleaned of foreign matter, through temporary connections where necessary, before the system is placed in service. Super heated high pressure steam piping shall be blown out following ASME procedures. Precautions shall be used to prevent foreign matter from getting into equipment and piping during construction. The supplier of water treatment equipment and chemicals shall recommend and furnish chemicals for the purpose of cleaning and blowing out of all systems. All chemicals, materials, instruments and labor shall be provided by the Contractor.
- B. The surfaces of all equipment and piping shall be clean upon completion of the work.
- C. All pipe line strainers shall be cleaned immediately before being turned over to the Owner for acceptance.
- D. During cleaning process, hammer welds to remove scale, weld slag and other debris.

3.03 TESTING

- A. Furnish all labor, material, instruments, supplies and services and bear all costs for the accomplishment of the tests herein specified. Correct all defects appearing under test and repeat the tests until no defects are disclosed; leave the equipment clean and ready for use.
- B. Perform all tests other than herein specified which may be required by Legal Authorities or by Agencies to whose requirements this work is to conform.
- C. Furnish all necessary testing apparatus, make all temporary connections and perform all testing operations required, at no additional cost to the Owner.
- D. All equipment and piping installed under this Contract shall be tested and found tight. Insulated or otherwise concealed piping shall be tested before being closed in. All leaking joints shall be corrected, retested and found tight. Such tests shall conform to the requirements of Local Codes but shall not be less than the equivalent of the tests called for herein. Threaded joints that leak shall not be seal-welded to correct leakage.
- E. Tests performed shall not relieve the Contractor of his responsibility for leaks which may develop after the tests are made.

- F. All piping systems shall be subjected to a hydrostatic test at 1 1/2 times operating pressure measured at the highest point in the system, for a period of (4) hours without drop in pressure.
- G. Tests of piping systems shall be conducted before connections to equipment are made and before piping is covered, buried or otherwise concealed.
- H. Systems found to have leaks shall be subjected to further tests when faulty joints have been repaired or replaced.
- I. Welded joints shall be subjected to a hammer test while under pressure.

END OF SECTION 232000

SECTION 233100 - SHEET METAL WORK AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install a complete system of air distribution, including accessories, to all areas indicated on the contractor drawings.
- B. Create, coordinate and submit ¼" scale Coordination Drawing in accordance with Section 230500.
- C. Provide all ductwork, fittings and accessories to make a complete and operational system in all respects.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. 2020 NYS Mechanical Code
 - 2. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible.
 - 3. UL 181 - Factory-Made Air Ducts and Connectors.

1.05 SUBMITTALS

233100 SHEET METAL WORK AND ACCESSORIES

- A. See Section 230500 and General Conditions for Additional Requirements.
- B. Product Data: Provide data for duct materials, duct connectors and all accessories. Include sound attenuator test data in accordance with ASTM E477.
- C. The Contractor shall submit duct fabrication standards and methods of installation, in compliance with SMACNA and these specifications, for review and approval by the Architect, clearly indicating the combination of metal gauges and reinforcement intended for use for each pressure classification. Duct fabrication shall not be allowed until a satisfactory review of this Standard has been performed and fabrication drawings have been reviewed and coordinated. MERELY SUBMITTING COPIES OF THE SMACNA PRESSURE CLASS TABLES DOES NOT COMPLY WITH THIS REQUIREMENT.
- D. Provide scaled ductwork fabrication drawings. Fabrication drawings shall be double line and as a minimum include elevations, dimensions, sizes, all offsets rises and drops, air distribution devices.
- E. Provide scaled ductwork coordination drawings for all floors and systems in accordance with Section 235000, Submittals.
- F. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA- HVAC Air Duct Leakage Test Manual.
- G. Manufacturer's Installation Instructions: Indicate special procedures for glass fiber ducts.
- H. Manufacturer's Certificate: Certify that installation of glass fiber ductwork meet or exceed recommended fabrication and installation requirements.
- I. Project Record Documents: Record actual locations of ducts, duct fittings and all accessories. Record changes in fitting location and type. Show additional fittings used.

1.06 QUALITY ASSURANCE

- A. All ducts and fittings shall be manufactured by a sheet metal fabrication company whose primary business experience is the manufacture of commercial and industrial quality

ducts and fittings. Contractor shall have adequate experience of building ductwork of the types required for this project as well as successful experience with projects of similar scope. Bids from sheet metal shops which do not meet the specified requirements shall not be acceptable.

- B. No Ductmate, Ward, Nixon or similar factory made slip-on connections will be permitted.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealants when temperature are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 - PRODUCTS

2.01 SHEET METAL WORK

A. General

- 1. Acceptable Manufacturers (Provided they are in compliance with these specifications)

- a. Sheet Metal

- 1) All ducts and fittings shall be manufactured by a sheet metal fabrication company whose primary business experience is the manufacture of commercial and industrial quality ducts and fittings. Contractor shall have adequate experience of building ductwork of the types required for this project as well as successful experience with projects of similar scope. Bids from sheet metal shops which do not meet the specified requirements shall not be acceptable.

- b. Sheet Metal Accessories

- 1) Flexible Connectors

- a) Ventlock
 - b) Elgen Manufacturing

233100 SHEET METAL WORK AND ACCESSORIES

- c) Duro Dyne
 - d) Ventglass
2. Unless otherwise noted, all supply, return and exhaust air ductwork of all types shall be constructed of galvanized sheet metal based on the "Pressure Class" indicated in the "Minimum SMACNA Construction Standards" table found hereinafter.
 3. The drawings are diagrammatic and indicate the arrangements of the principal apparatus, ductwork and piping and shall be followed as closely as possible. Because of the scale of the drawings, it is not possible to show all offsets, rises, drops, rises, fittings, accessories, etc. The Contractor shall carefully investigate the structure, finish conditions, and the work of other trades affecting the work and arrange ductwork, piping, equipment, accessories, etc. accordingly. Provide the best possible arrangement so as to provide the maximum headroom and access to apparatus while providing the minimum resistance to airflow. This work and any extra fittings and offsets required shall be included in the project without extra charge.
 4. In addition to sheet metal ductwork provided under this Contract furnish and/or install accessories and devices furnished by others, including but not limited to smoke detectors. Provide and install miscellaneous sheet metal work including safing, mixing baffles, and blank off panels at unused louver areas.
 5. All duct systems specified to be installed under this Contract, shall conform to the drawings, specifications, Standards, details and recommendations of the latest Edition of SMACNA "HVAC Duct Construction Standards - Metal and Flexible"; and "Round and Industrial Duct Construction Standards" (hereinafter referred to as Duct Manual). Where the requirements under this Section exceed the requirements of the Duct Manual, the specification shall govern. Wherever the word "should" appears, replace with the word "shall".
 6. The Contractor shall submit duct fabrication standards and methods of installation, in compliance with SMACNA and these specifications, for review and approval by the Architect, clearly indicating the combination of

metal gauges and reinforcement intended for use for each pressure classification. Duct fabrication shall not be allowed until a satisfactory review of this Standard has been performed. MERELY SUBMITTING COPIES OF THE SMACNA PRESSURE CLASS TABLES DOES NOT COMPLY WITH THIS REQUIREMENT.

7. All galvanized steel sheet metal shall have not less than 1.25 oz. of zinc on each side of each square foot of sheet. All other duct materials shall be as hereinafter specified as applicable to this Contract.
8. There will be no supply and/or return air system ductwork internally lined unless otherwise noted.
9. The Contractor shall clean and provide temporary caps on all ductwork during installation to prevent dust, dirt and debris from entering ducts during construction, including during shipping, handling and storage in the field.
10. All shop applied fabrication labels shall be applied to the exterior of the ducts. The Contractor shall remove any material applied to the inside of the ducts before installation.

2.02 DUCT CONSTRUCTION

A. Duct Construction Schedule

Minimum SMACNA Construction Standards						
Ductwork Location	Pressure Class Inches W.G.	Seal Class	Leakage Class	Material	Sound Lining	Table Notes
Return to Roof Top Units constant volume systems.	-4	A	4	G-90	No	
Supply from Roof Top Units constant volume systems	±4	A	4	G-90	No	
General exhaust	-3	A	4	G-90	No	

2.03 ADDITIONAL CONSTRUCTION REQUIREMENTS

A. Minimum Requirements

1. The minimum gauge for any steel duct over 2" or under -2" pressure class shall be 24 gauge except when specified heavier.
2. The minimum thickness of any aluminum duct shall be 0.040".
3. The minimum diameter of any tie rod shall be 1/2".
4. The maximum tie rod spacing shall be 42" unless specifically engineered in accordance with the SMACNA Industrial Rectangular Duct Standard.
5. When tie rods intersect, they shall be welded to each other.
6. No ductwork shall be constructed to less than ± 2 " w.g. This means nothing is constructed to a standard between -2" w.g. and +2" w.g.
7. Duct dimensions indicated are clear inside dimensions. The sheet metal dimensions shall be increased to accommodate internal liner where liner is required.

B. All joints and seams in all ductwork and casings shall be sealed to SMACNA Seal Class "A". In finished areas, sealing compound shall be neatly applied to exposed ductwork and bands shall be provided over, to cover the sealant.

1. Some SMACNA constructions may not be suitable for the leakage classes specified even though they may meet the pressure class and should not be used.
2. Seal class A Welded means all welded (i.e. transverse joints, longitudinal seams, spiral seams, fire dampers, volume dampers or any accessories) and in addition it means continuously welded.
3. All sealants, adhesives and coatings shall be of approved kinds and qualities for each point of application, complying with recommendations for the use and storage.
4. The method of installation and materials for sealing the ductwork shall be submitted by the Contractor for review and approval by the Architect, as part of the

ductwork construction standards and installation submittal.

- C. All longitudinal seams in all ductwork in excess of +2" w.g. or less than -2" w.g. pressure class shall be made with formed Pittsburgh locks.
- D. Grooved seam/flat lock/pipe lock joining methods is restricted to 2" W.G. pressure class only.
- E. Button punch-snap lock seams are not to be used.
- F. Concealed stainless steel ductwork shall have an ASTM mill rolled No. 1 or No. 2 D finish. Exposed stainless steel ductwork shall have an ASTM mill rolled No. 2 B finish, or higher grade as required by the Architect, with all welds ground smooth and final brushed with stainless steel wire brushes. All welds on exposed stainless steel ductwork shall be free of stain, burn-through, or discoloration to the satisfaction of the Architect.
- G. Tie rods shall not be used in any plenum or large duct requiring internal access or use as an access pathway.
- H. All ductwork required to be removable shall be companion flanged SMACNA Type T-22 for ductwork constructed to SMACNA Metal Duct Standard and companion flanged in accordance with Industrial Standards for ductwork required to be constructed to Industrial Standards.
- I. Elbows
 - 1. All dust collection ductwork elbows shall be a centerline radius equal to (2) duct widths or diameters. No reduction shall be allowed.
 - 2. Radius elbows shall be used wherever possible. Where it is impossible or impractical to install a 1.5 times width to centerline radius of elbow (full radius elbow) lesser radii configurations shall be used, each with "radius-proportional" splitter vanes permanently installed within. No radius shall be less than 1.0 times the width. Provide square elbows in rectangular ducts with double thickness vanes with a minimum radius of 4 1/2". Square elbows may only be used when radius elbows will not fit and where specifically approved by the Architect prior to fabrication and/or

as required by coordination shop drawings. All offsets shall be of the radium type.

- J. It is the intent of this specification to provide a duct system with minimum resistance to airflow. All take-offs shall be throated and transitions made as gradually as possible. "Bullhead" or sharp take-offs shall not be acceptable.
- K. In addition to SMACNA requirements, ductwork in return systems without boxes, ductwork in supply systems without boxes, ductwork in exhaust systems without boxes, ductwork in any Constant Volume System and/or ductwork downstream of VAV Boxes shall be provided with:
 - 1. Volume dampers in all branch takeoffs and in all main branches and ducts of all ductwork systems (supply, return and exhaust) for properly regulating and balancing airflow to all terminal outlets, for all duct sizes, whether shown on the drawings or not. The above requirement is mandatory.
- L. All rectangular dampers shall be opposed blade and each shall be controlled by an approved galvanized locking quadrant indicating the damper position, as detailed on the drawings.
 - 1. Volume dampers installed into ductwork that is specified to be externally insulated shall have extended activator/handle rods with extension bracket such that adjustment of the damper handle will not disturb the insulation.
- M. Coordinate the location and areas and fabricate the ductwork system accordingly.
- N. Provide any and all balancing dampers required at no additional cost.
- O. In addition to SMACNA requirements, all round ductwork, if used in lieu of rectangular supply and/or return/exhaust systems shall conform to SMACNA.
 - 1. The use of flat oval ductwork shall be acceptable only with prior written approval of the Architect. **Note:** Flat oval shall not be used under negative pressure.

2. Round duct shall be manufactured of spiral lock seam. Ductwork up to 12"Ø and 2" w.g. pressure class can be manufactured with longitudinal lock seams.
3. All tees shall be conical.
4. All laterals shall be straight.
5. All taps through 10" diameter in size shall have a machine drawn entrance and all fittings shall have longitudinal seams, continuous-welded. Both sides of all welds shall be primed with zinc chromate.
6. All tap entrances shall be free of weld build-up.
7. Elbows in diameters 3" through 10" shall be 2-section stamped or pleated elbows. Larger elbows shall be gored construction. Elbows shall be fabricated to a centerline radius of 1.5 times the diameter. All gored elbows shall be fabricated according to the following schedule:

<u>Elbows</u>	<u># of Gores</u>
Up to 35°	2
36° to 71°	3
Over 71°	5
8. All field joints in diameters through 48" shall be made with a 2" long slip-fit or sleeve coupling provided assembly is not hindered. Ductwork over 48", and for all sizes where disassembly and removal is required, shall be joined with Vanstone or shop fabricated flanges.
9. All flanges and taps into spiral ducts shall be factory or shop fabricated and installed as hereinbefore specified. Shipment of loose flanges or taps for field installation shall be avoided.
10. All access doors for round duct shall be furnished by the access door manufacturer. Round duct access doors shall be of low leakage sandwich type suitable for systems up to 8" pressure, positive or negative. Round duct access doors shall be insulated and shall be equivalent to Ruskin model ARDD.
11. Unless specifically noted otherwise or required by special constraints, all elbows on ductwork changing

direction from vertical to horizontal shall be 1.5 times radius.

2.04 SOUND ATTENUATORS FOR DUCTWORK

- A. Where indicated on the Drawings, provide in the ductwork packaged sound traps of proper models and sizes for the purpose of attenuating noise. Sound traps shall be as specified herein and shall conform with the requirements tabulated on the Drawings.
- B. Construction
 - 1. Rectangular Units: Fabricate casings with a minimum of 0.034-inch thick, solid galvanized ASTM A653 sheet metal for outer casing and 0.022-inch thick, ASTM A653 perforated galvanized sheet metal for inner casing.
 - 2. Round Units:
 - a. Outer Casings:
 - 1) ASTM A653 galvanized sheet steel
 - 2) Up to 24" in Diameter: 0.034" thick
 - 3) 26" through 40" in Diameter: 0.040" thick
 - 4) 42" through 52" in Diameter: 0.052" thick.
 - 5) 54" through 60" in Diameter: 0.064" thick.
 - 6) Casings fabricated of spiral lock-seam duct may be one size thinner than that indicated.
 - b. Interior Casing, Partitions, and Baffles:
 - 1) ASTM A653 galvanized sheet steel
 - 2) At least 0.034" thick and designed for minimum aerodynamic losses
 - 3. Sheet Metal Perforations: 1/8" diameter perforations for inner casing and baffle sheet metal.

4. Fill Material: Inert and vermin-proof fibrous material, acoustic grade glass fiber packed under not less than 5 percent compression.
5. Erosion Barrier: Polymer bag enclosing fill and heat-sealed before assembly or Tedlar film liner as a fill protection.
6. Fabricate silencers to form rigid units that will not pulsate, vibrate, rattle, or otherwise react to system pressure variations.
 - a. Do not use nuts, bolts, or sheet metal screws for unit assemblies.
 - b. Lock form and seal or continuously weld joints.
 - c. Suspended Units: Provide factory-installed suspension hooks or lugs attached to frame in quantities spaced to prevent deflection or distortion.
 - d. Reinforcement: Provide cross or trapeze angles for rigid suspension.

C. Performance

1. The attenuation values obtained by the sound traps shall be not less than those tabulated on the Drawings. They shall be true attenuation values, only accomplished by the sound traps. These true attenuations shall not include any effects due to (1) end reflections, (2) room absorptions, (3) plenum absorption, (4) directivity, (5) beaming, (6) standing waves or (7) distance factors.
2. Adhesives, sealants, packing materials, and accessory materials shall have fire ratings not exceeding 25 for flame-spread index. Smoke developed index ratings shall not exceed 50 when tested according to ASTM E84.

- D. Air Flow Pressure Drop: Air flow pressure drop values shall not exceed those indicated on the Drawings. The air flow pressure drop performance shall be certified by the manufacturer to have been tested and rated in accordance with applicable portions of AMCA Bulletin 210, or with a method of air measurement approved by the Authority.

- E. Source Quality Control:
1. Acoustic Performance: Test according to ASTM E477.
 2. Record acoustic ratings, including dynamic insertion loss and self-noise power levels with an airflow of at least 2000-fpm face velocity.
 3. Leak Test: Test units for airtightness at 200 percent of associated fan static pressure or 6-inch wg static pressure, whichever is greater.
- F. Manufacturers: Subject to compliance with requirements, provide sound traps from one of the following (or approved equal):
1. Vibro-Acoustics
 2. Industrial Acoustics Company
 3. Price Industries
 4. McGill AirFlow Corporation.
 5. Or Approved Equal

2.05 SHOP APPLIED DUCT LINER

- A. Interior supply and return ducts and plenums (other than outside air plenums), as hereinbefore specified, where no sound attenuators are shown on plans, to have internal duct insulation shall be lined with 1" thick fiberglass duct liner equal to Manville Permacote Linacoustic R300.
- B. Liner shall meet the requirements of UL 181, ASTM C665 Bacteriological Standards, UL 723 Flamespread and NFPA 90A for flamespread and smoke developed ratings as borne out by tests and ratings of UL. Liner shall have an NRC no less than 0.80, based on Type A mounting as tested in accordance with ASTM C423-90 "k" factor not to exceed 0.25 (1") at 75°F mean temperature in accordance with ASTM C-518.
- C. Maximum air friction in straight 24" diameter duct conveying 6200 cfm airflow at 2000 fpm velocity shall be 0.36" per 100'-0"

- D. No erosion of insulation material shall occur below 5000 fpm duct velocity. Rigid board liner shall be constructed of strong glass fibers bonded with thermosetting resin.
- E. All surfaces shall be protected with an acrylic coating.
- F. Liner shall be applied with 100% coverage of approved fire resistant adhesive. Ducts over 20" in size in any direction shall be secured with mechanical fasteners ("stick-clips") on 12" centers and within 3" of ends.
- G. Leading and exposed edges of liner joints shall be coated with fire resistant adhesive. Permacote-coated surface shall face the airstream.
- H. The ductwork system shall be lined/sealed and installed in a manner to allow for low temperature air operation.
- I. Care shall be exercised to ensure that no gaps or bare sheet metal exist, which might create condensation.
- J. Acoustical liner installed in medium pressure ductwork and wherever lining starts abruptly from unlined ductwork shall be "nosed" with sheet metal flanging at all joints in accordance with SMACNA liner nosing details.
- K. Liner shall be coated with a surface coating that does not support the growth of fungus or bacteria as determined by tests in accordance with ASTM C1071 and ASTM G21 and G22. Liner shall be sound absorptive.
- L. The smooth black surface of the liner shall face the airstream and top pieces shall support the side pieces.
- M. Lining on double wall duct systems may be completely covered with a layer of perforated minimum 24 gauge sheet metal (3/16 sq.in. holes on 7/16" staggered centers). The perforated sheet metal inner liner shall be secured with rivets and washers at intermediary points maximum 12" on center on all spans greater than 12" in width or height. Sheet metal nosing shall be provided to cover all insulation exposed-to-airstream edges, by bending of the sheet metal liner. Other methods of nosing, if different than the one specified, shall be submitted for review by the Architect prior to installation.

2.06 FLEXIBLE CONNECTIONS (AHUS, EMERGENCY GENERATORS, FANS)

- A. Provide flexible connections of 4" minimum fabric width
 - 1. Equipment equipped with fans
 - 2. All ductwork that crosses building expansion joints
- B. The connections shall be placed as close to the equipment as practical except at fan suction connections and the clear gap at rest shall be not less than 3". At fan suction connections, locate flexible duct connection at least 3 duct diameters away from fan inlet connection.
- C. There shall be no tension of the fabric under static or dynamic loads
- D. All fabric for flexible duct connections to equipment shall be a minimum of 22 oz. glass fabric, double coated with neoprene, fire retardant, waterproof, airtight, and approved by UL, similar to Ventfabrics or Ventglass.
- E. Exterior flexible connection shall be insulated type similar to Duro Dyne.
- F. Flexible connections shall be fabricated from approved flameproofed fabric conforming to NFPA 90A. Asbestos shall not be acceptable.
- G. Flexible connections shall be installed further upstream from fan powered equipment (in the main duct size) to prevent obstruction of the fan inlet due to suction of the fabric into the airstream.
- H. Ductwork shall be increased in size where the flexible connections are located to prevent fully drawn in connections from blocking any duct area. Submit detail for review.

PART 3 - EXECUTION

3.01 SHEET METAL INSTALLATION

- A. All ductwork shall be installed to true alignment, generally parallel or perpendicular to adjacent building walls, floors and ceilings, so as to present a neat and workmanlike appearance. All fabricated, stored and installed ductwork shall be protected with removable caps, plastic or other means to prevent dirt, water and debris from entering duct system. The Contractor shall be

responsible for maintaining a clean duct system and shall clean and/or replace any ductwork identified by the Owner or Architect as being deficient or dirty. The Contractor shall be responsible for all costs associated with the temporary protection cleaning and/or replacement of ductwork. All fabrication labels shall be applied to the exterior of the duct. The Contractor shall be responsible for the removal of all internal labels if such labels were incorrectly applied.

- B. Care shall be paid to the exact locations of all sheet metal work with respect to equipment, ducts, conduits, piping, slabs, beams, columns, ceiling suspension systems, lighting fixtures and electrical, plumbing and fire protection systems in the building. Close coordination and cooperation shall be exercised with other Trades in locating the piping and equipment in the best interests of the Owner. The drawings and specifications covering other work to be done in the building shall be carefully studied and arrangements shall be made to avoid conflict.
- C. The drawings shall be followed where they are definite and provided such procedures do not cause objectionable conditions for equipment provided installed under this Contract. The drawings are intended to indicate the sizes of ductwork and if certain sizes are omitted or unclear, obtain additional information before proceeding.
- D. Locate and size all openings for ductwork in the building construction. Provide all sleeves as hereinbefore specified.
- E. Provide access doors in ductwork at the following locations:
 - 1. Both sides of automatic dampers
 - 2. Humidifiers
 - 3. Both sides of filters
 - 4. Otherwise indicated or specified
- F. The installation of special items of equipment in the duct systems, including automatic dampers, thermostats, thermometers, duct airflow measuring devices and other related controls, shall be done by this Contractor under

the direct supervision of the manufacturer of such controls.

- G. All elbows, tees and branch takeoffs in round ductwork shall be made of the same materials as the ductwork.
- H. Duct connections to equipment shall be in no case smaller than the equipment openings.
- I. All openings for pitot tube traverses shall be fitted with neat removable plugs or caps. As a minimum, such openings shall be provided at every fan inlet and at such other points as may be required for airflow measuring and balancing. Coordinate the location of plugs and caps.
- J. All internally lined duct sections and joints shall be closely inspected by the contractor before and after each piece is erected. Loose edges, open joints, damaged areas and other defects shall be sealed securely so as to insulate all metal surfaces and so as to endure without falling in the presence of moving air. All liner applications shall comply with SMACNA "Duct Liner Application Standard".
- K. Provide other miscellaneous sheet metal work shown on the drawings including blanking off portions of louvers not required for the specific usage and diffusion plates or mixing air scoops to allow for air mixing where job conditions require the provision of same. All above work shall be provided as part of this Contract at no extra cost to the Owner.
- L. Where applicable and as approved by the Architect, all exposed ductwork shall be installed in a workmanlike manner to result in a neat appearance with no visible penetrations, screws, or other sheet metal imperfections.
- M. Install all UL classified devices in accordance with their UL approved installation sheets.
- N. Counterflashing of duct penetrations through roof shall be provided under this Contract.

3.02 DUCT HANGERS AND SUPPORTS

- A. Provide suitable angle iron/strap hangers and supports inside the mechanical shafts, mechanical rooms and in ceilings of the buildings, and on the roof(s) as shown on

the drawings (Architectural/HVAC). This work shall be performed as required by job conditions and as instructed by the Architect in the field to support all air distribution ductwork and devices in both horizontal and vertical planes.

- B. When hanging and supporting the ductwork, the following shall be complied with:
1. Except as otherwise noted, ductwork up to 42" in greatest dimension shall be hung by using sheet metal bands secured as a minimum at (2) locations to the vertical sides of the ductwork and at (1) location under the duct. All support systems shall be compatible with the building structure and roofing system as approved by the Architect.
 2. Where ductwork major axis dimension is larger than 42", ductwork shall be hung by using rods of not less than 3/8" soft steel secured to angle iron trapeze support frame around ductwork with threaded nuts for securement and adjustment. All rods used on ductwork exposed in finished spaces shall be plain smooth rods threaded only at the ends.
 3. Ductwork shall be securely attached to the building construction. The hanger design and spacing shall be governed by the major duct dimension and shall be in accordance with SMACNA Duct Manual, except as modified hereinbefore. Vertical ductwork shall be supported at each floor level in an approved manner using angles or channels attached to the ducts. The installation, when complete and under operating conditions, shall be free from chatter or vibration. If necessary to achieve this, additional supports and/or bracing shall be furnished without extra cost to the Owner. Supports and bars and similar items shall be primed and painted structural steel. Touch up with aluminum paint any surfaces where galvanizing is destroyed on indoor ductwork, zinc primer on exposed ductwork with a final coat of aluminum paint. Provide vibration isolation hangers where specified under Vibration Isolation Section of these specifications.
 4. The Contractor shall provide all supplemental steel required to support the ductwork in shafts, mechanical rooms or on the floor where structural steel is not properly positioned. Beam clamps shall be double sided.

5. The maximum hanger spacing shall be 10'-0" on centers and additionally on each side of an elbow or change-in-direction fitting.
6. In addition to the above, provide supports on each side of any duct mounted device, fans, coils, flow measuring stations, framed dampers, etc., to permit removal of the device without disconnecting adjacent duct sections.
7. Provide angle sway bracing to the structure wherever lateral loads would be imposed on the ductwork, including but not limited to:
 - a. Elbows downstream of fan discharges.
 - b. Ductwork exposed to the weather subject to wind loads.
8. Ductwork mounted on the roof or otherwise exposed to the elements shall be supported with frames constructed of steel angles and channels regardless of duct size.
 - a. Coordinate all roof supports.
 - b. Provide diagonal cross bracing between supports as required to sustain maximum area wind loads as dictated by the Architect.

3.03 SHEETMETAL TESTING

A. General

1. All ductwork that is required to be tested shall be tested on regular intervals as the job proceeds and shall be completed prior to enclosure in shafts, above ceilings or behind walls.
2. The Contractor shall keep an up-to-date log of the ductwork tested for review by the Architect.
3. The Contractor shall furnish and install all blank off plates, blind flanges, safing, etc., necessary to isolate each section of duct being tested for leakage.
4. The Contractor shall submit for review all proposed testing procedures, sample report, and equipment to

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the Engineer prior to proceeding. Additionally, the Contractor shall notify the Engineer when testing is to occur so that the test can be witnessed at the Engineer's option.

5. All test equipment shall be calibrated per ANSI Standards prior to testing. Certified test reports shall be submitted to the Architect prior to commencement of the testing.
6. Testing Procedure
 - a. The testing procedure shall be in accordance with SMACNA "HVAC Air Duct Leakage Test Manual".
 - b. The test pressure shall be the specified construction pressure of the duct system.
7. Scope of Testing
 - a. All ductwork (regardless of pressure class) that will be in inaccessible areas including, but not limited to, all ducts within shafts, above hard ceilings, and those that will be made inaccessible by the work of other Trades. (This shall include ± 2 " w.g. construction.)
 - b. All ductwork constructed to greater than $+2$ " w.g. or less than -2 " w.g.
 - c. All other sheet metal in duct systems constructed to ± 2 " w.g. shall be tested under normal fan pressure and shall not leak sufficiently to cause audible leaks or blowing detectable by hand. **If, in the opinion of the Architect, the ductwork does not appear to be constructed and/or sealed to the approved shop standards, the Architect may request any or all of this ductwork to be tested at the specified construction pressure.**
 - d. Allowable Leakage
 - 1) The total allowable leakage shall be less than specified leakage class with no audible leaks.
 - 2) If no leakage class is listed elsewhere, the system shall meet leakage Class 4.

END OF SECTION 233100

SECTION 233900 - FANS AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all fans of the various types, arrangement and sizes specified herein and as scheduled on the drawings.
- B. Fans shall include all motors, drives, curbs, flashing, special coatings and accessories.
- C. Furnish and install backdraft dampers with all fans.
- D. Furnish and install all roof curbs and automatic dampers.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as following:
 - 1. AMCA 99 - Standards Handbook; 1986.
 - 2. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes; 1985.
 - 3. AMCA 261 - Directory of Products Licensed to Bear the AMCA Certified Ratings Seal; 1995.

4. AMCA 300 - Test Code for Sound Rating Air Moving Devices; 1994.
5. AMCA 301 - Method of Publishing Sound Rating Air Moving Devices; 1994.
6. NEMA MG 1 - Motors and Generators; 1993 (and Revision 1).
7. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease Vapors from Commercial Cooking Equipment; 1994.
8. UL 705 - Power Ventilators; 1994.

1.05 SUBMITTALS

- A. See Section 230500 and General Conditions for additional requirements.
- B. Submit certified curves showing fan performance with system operating points plotted on curves.
- C. Submit motor data sheets including motor efficiency and power factor at various loadings of nameplate horsepower. Motor efficiency and power factor shall be shown for 100%, 75% and 50% of nameplate horsepower. Submit data on efficiency and power factor required for motors 1 HP and above only. Motors shall have premium efficiency motors with minimum efficiency on motors listed in specification.
- D. Submit bearing sizing calculations for each similar size and type of fan. Fan bearing calculations shall be based on fan at maximum operating conditions including belt pull. Calculations shall be done for both fan bearings and motor bearings. Calculations required on centrifugal fans, vent sets in-line fans, wall mounted propeller fans and vane axial fans only.
- E. Submit sound power levels for each size and type of fan. Sound levels shall be in all (8) octave bands for discharge of fan, inlet to fan, and radiated noise through casing.
- F. Submit certified shop drawings indicating all dimensional data, and operating and maintenance clearances.

1.06 QUALITY ASSURANCE

- A. Fans shall conform to most recent AMCA Bulletins regarding construction and testing. Fans shall be tested and rated

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per AMCA and shall be selected in proper operating range without motor overloading and fan surge.

- B. Manufacturers must prove experience in the production of similar products of this type for at least ten (10) years prior.
- C. Fans shall be air and sound certified in accordance with AMCA 210 and 300 and shall bear the AMCA seal.
- D. Kitchen Range Hood Exhaust Fans: Comply with requirements of NFPA 96.
- E. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. and other testing firm acceptable to the authority having jurisdiction and all suitable for the purpose specified and indicated.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not operate fans for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings have been lubricated and fan has been test run under observation.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Manufacturers acceptable contingent upon product's compliance with the specifications are as follows:
 - 1. Roof Mounted Centrifugal Fans
 - a. Greenheck Fan Corp.
 - b. Loren Cook Co.
 - c. ACME Fan Co.
 - d. Twin City Fan
- B. Selection and Balancing
 - 1. Provide and install items as listed in equipment schedules, as shown on drawings, and as specified, complete in all respects to the functions intended.

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2. Provide fans capable of accommodating static pressure variations of $\pm 10\%$.
3. Provide balanced variable sheaves for motors 15 HP and under, and fixed sheaves for 20 HP and over.
4. Statically and dynamically balance fans in the field to eliminate vibration or noise transmission to occupied areas of the building. Provide certificate of compliance from manufacturer.
5. Provide OSHA and ANSI approved belt guards on interior mounted belt driven fans. Provide weatherproof ventilated housing for exterior mounted fans.
6. Provide safety, bird or insect screen where inlet or outlet is exposed.
7. All fans shall be manufactured in accordance with this specification even where techniques are required which are not considered standard by that manufacturer.
8. Verify fan arrangement with the Contractor including motor location for servicing and discharge arrangements for proper airflow.
9. Where fixed speed sheaves are specified for a particular fan, provide (2) additional sheaves (one motor and one drive) as necessary for final air balancing.

C. Painting

1. Each fan component shall be thoroughly cleaned, degreased and deburred before the application of a rust preventive primer.
2. Two (2) coats of a rust preventive primer shall be applied under a topcoat of air-dried epoxy or enamel. Minimum coating thickness shall be 5 to 6 mils. The final coat shall be applied after final assembly to all surfaces.
3. Special coatings shall be provided for corrosive exhaust systems as specified under the fan specification.

D. Inlet Vanes

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1. Variable volume inlet vane control with modulating inlet dampers shall be provided as required by control sequence or as scheduled on the drawings. The inlet vanes shall consist of at least (7) blades per slide, each adequately supported with pivot bearings on each blade. Blades shall be center supported or cantilevered. Both sets of inlet vanes shall be operated by (1) lever mounted on the fan housing with connecting shaft between fan inlets. The inlet vane control operating mechanism and linkage may be center located or located inside the fan housing. The inlet vane control must be mounted in the inlet cone. Bolt-on type controls do not provide smooth inlet airflow and are not acceptable. Pneumatic operator shall be provided and installed by others. Fan shall have stable operation over the entire variable inlet vane operating range from shut-off to free delivery.

2.02 FAN DRIVES

- A. All fans shall be provided with variable speed (frequency) drives where fan motors are 3 phase. Where fan motors are single phase, the fans shall be provided with speed controllers with all required wiring modifications.

2.03 ROOF MOUNTED CENTRIFUGAL FANS

- A. Provide belt driven centrifugal type roof mounted fans with capacities as indicated in the equipment schedules on the mechanical drawings. Fans complete with curb cap suitable for curb mounting. Roof curbs shall be provided by the Contractor.
- B. Fans housing shall be heavy gauge spun aluminum with gauges as listed in the following schedule, mounted to a rigid support network constructed of galvanized or epoxy coated steel. Fan housing shall have a rigid wire bird screen mounted to the unit discharge.
- C. Drive frame, bearing support, and motor support shall be heavy gauge galvanized steel.
- D. Fan inlet cone shall have a die spun hyperbolic shape, matched to the wheel cone to ensure full loading of fan blades to maximize efficiency.
- E. Fan wheel shall have single thickness backward inclined blades or true hollow airfoil shaped blades. Wheel characteristics shall be non-overloading.

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- F. Fan inlet cone, wheel cone, blades and backplate shall be constructed of heavy gauge aluminum.
- G. Blades shall be welded, riveted or bolted to wheel cone and backplate.
- H. Wheel shall be statically and dynamically balanced.
- I. Drive shaft shall be ground and polished high grade steel supported by permanently lubricated sealed ball bearings housed in a cast iron flanged mounted housing.
- J. Bearings shall be sized for a minimum L-10 life of 100,000 hours at maximum fan operating conditions including belt pull. Bearings shall be selected in accordance with standards set forth by the Anti-Friction Bearing Mfrs. Assn.
- K. Drives shall be sized for a minimum of 1.65 times the fan motor horsepower. Sheaves shall be adjustable and have a tapered split and keyed hub. Belts shall be oil resistant 24,000-hour non-static type.
- L. Motor and drive assembly shall be mounted on neoprene vibration isolators.
- M. Motor, drive, and bearings shall be out of the exhaust airstream and housed to facilitate ease of maintenance. Motor cooling shall be through the fan drive and motor housings.
- N. Motor shall be wired to a factory installed disconnect switch. All wiring and electrical components shall comply with the National Electric Code and be UL listed.
- O. Motors shall be TEFC in accordance with the Motor Section of the Special Conditions.
- P. Provide automatic damper. Damper to open when fan is energized and close when fan is de-energized. See Sheet Metal Section for damper specification.
- Q. Damper to be field installed in duct at fan inlet.
- R. All fasteners shall be stainless steel.
- S. Refer to Roof Curbs Section.

2.04 ROOF CURBS

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A. General

1. Provide roof curbs for sheet metal duct penetration roof mounted fans, gravity intake, exhaust and relief hoods of types and sizes as shown on the drawings and as hereinafter specified. Roof curbs shall be as manufactured by the approved fan or hood manufacturer.
2. Refer to other Sections of this specification and Section 15000 for General Requirements and Conditions.
3. Roof curbs shall be suitable for field flashing by the Contractor.

B. Materials

1. Roof Curbs

- a. Roof curbs shall be prefabricated, acoustical type, constructed of 16-gauge aluminum, preinsulated with insulation protected from erosion.
- b. Roof curbs shall be supplied by the fan manufacturer.

C. If the fan manufacturer does not supply the roof curb as indicated in writing on their letterhead, the acceptable Manufacturers subject to compliance with the specification shall be:

1. Roof Curbs:
 - a. Loren Cook Co.
 - b. Greenheck
 - c. Thycurb
 - d. Or approved equal

PART 3 - FAN INSTALLATION REQUIREMENTS

3.01 INSTALLATION

- A. Fans shall be installed in accordance with manufacturer recommendations, Contract Drawings and reviewed submittals.

- B. Fans shall be installed so as to ensure easy accessibility for service or removal or replacement of all components such as, but not limited to, fans, motors, belts, drives, bearings, dampers, actuators, isolators, and field connections.
- C. The Contractor shall install all motors and drives shipped loose. Fans shall be installed and tested, and shall be made fully operational by the Contractor.
- D. Provide fixed sheaves as necessary for final air balancing. The Contractor shall install the fixed sheave after balancing with the Contractor to adjust the fans.
- E. Manufacturer shall include the adjustment of pitch for adjustable pitch fans as required by balancing.
- F. Set roof mounted fans on sound absorbing insulated curbs. Coordinate installation. Curbs shall be provided by the Contractor. The Contractor shall provide all counter flashing.
- G. Mount vent sets and vane axial fans located on roof to inertia bases as required under Vibration Isolation Section.
- H. Make all penetrations through roof or vertical walls watertight. Submit methods of sealing to Architect/Engineer for review and approval.
- I. All fans shall have flexible inlet and outlet couplings to prevent vibration transmission to ductwork.
- J. The Contractor shall assemble all loose parts including motors and drive assemblies on site and shall vibration balance the fans in the field. Field adjustment including belt alignment, wheel balancing, belt tension, greasing of bearings, installation of belt guards, and other loose parts shall be provided by the Contractor.

3.02 COORDINATION

- A. The Contractor shall coordinate the fan arrangement with the coordinated ductwork layout prior to ordering the fan. The Contractor shall provide all labor and materials necessary to change fan arrangement in the field when fan arrangement does not match ductwork.
- B. The inlet and discharge ductwork shall have a minimum straight run of (2) fan diameters upstream and downstream

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of the fan. The Contractor shall notify the Engineer in writing if these conditions cannot be achieved. Installation of improper inlet/discharge conditions without the review of the Engineer shall be corrected in the field at no cost to the Owner.

- C. The Contractor shall provide all supplemental steel, supports, rods and hangers necessary to hang or mount fans. Supports shall include thrust restraint as required by the fan manufacturer.
- D. The fan manufacturer and Contractor shall coordinate the fan orientation for tubular centrifugal fans and shall verify that the fan support and bearings are supplied for the coordinated fan orientation (horizontal or vertical). The Contractor shall revise the fan in the field if job conditions require changing of orientation, at no cost to the Owner.
- E. The Contractor shall receive and inspect all fans and motors to make sure that all fans are received without defect. All defective or damaged fans shall be returned to the manufacturer by the Contractor for replacement.
- F. The Contractor shall properly protect all equipment to prevent damage from water, dirt, etc. Protection shall include temporary plastic wrap to keep equipment in original factory condition. Fans used for temporary ventilation during construction shall be totally cleaned and refurbished prior to turnover to the Owner.
- G. The Contractor shall mount and vibration balance all fans. The Contractor shall furnish and install power wiring to the fan motor and verify proper fan rotation. The Contractors shall coordinate the starter requirements to ensure that the proper starter is installed for non-standard motors. The Contractor shall wire all interlocking wiring to the fan including smoke detector wiring for fan shutdown.
- H. The Contractor shall mount all automatic control dampers on the fan either shipped loose or provided by the ATC Contractor.
- I. The Contractor shall mount all field mounted flow measuring devices on the inlet or discharge of the fan prior to fan installation.

END OF SECTION 233900

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SECTION 237405 - PACKAGED ROOFTOP AIR CONDITIONING UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all factory built packaged rooftop air conditioning units air handling units. This shall include all piping, ducts and supports specified in this Division and as shown on the drawings
- B. All units shall be new and manufactured for the specific purpose of providing conditioned air (heating and cooling) to the systems indicated.
- C. All system components shall be installed in accordance with local codes.
- D. Secure all permits and local/state approval for the components as specified and included under this Section.

1.03 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- B. ARI 360 - Unitary Air-Conditioning Equipment.
- C. ANSI/ASHRAE/IESNA 90.1-1999 - Energy Standard for New Buildings Except Low-Rise Residential Buildings.
- D. ARI 370 - Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment.
- E. ARI 260 - Sound Rating of Ducted Air Moving and Conditioning Equipment

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- F. California Administrative Code - Title 24 establishes the minimum efficiency requirements for HVAC equipment installed in new buildings in the State of California.

1.05 SUBMITTALS

- A. Submit drawings indicating components, dimensions, weights and loadings, required clearances, and location and size of field connections.
- B. Submit product data indicating rated capacities, weights, accessories, service clearances and electrical requirements.
- C. Submit manufacturer's installation instructions.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data.
- B. Include manufacturer's descriptive literature, start-up and operating instructions, installation instructions, and maintenance procedures.

1.07 Delivery, storage, and handling:

- A. Unit shall be stored and handled per manufacturer's recommendations.
- B. Lifted by crane requires either shipping top panel or spreader bars.
- C. Unit shall only be stored or positioned in the upright position.
- D. Protect units from physical damage. Leave factory-shipping covers in place until installation.

1.08 WARRANTY

- A. Provide a full parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.
- B. Provide five year extended warranty for compressors including materials only.
- C. Provide five year limited warranty for heat exchanger including materials only.

1.09 MAINTENANCE SERVICE

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- A. Furnish complete service and maintenance of packaged rooftop units for one year from Date of Substantial Completion by contractor.
- B. Provide maintenance service with a two-month maximum time interval between calls. Provide 24-hour emergency service on breakdowns and malfunctions.
- C. Include maintenance items as outlined in manufacturer's operating and maintenance data.
- D. Submit copy of service call work order or report to the Owner, and include description of work performed.

1.10 ACOUSTICS

- A. Manufacturer of packaged rooftop equipment shall provide indoor and outdoor sound power level data across all major octave band center frequencies for cataloged operating range of unit at gross cooling capacity range. Data shall be obtained in conformance with ARI Standard 260 - Sound Rating of Ducted Air Moving and Conditioning Equipment.

1.11 REGULATORY REQUIREMENTS

- A. Unit shall conform to UL 1995 for construction of packaged air conditioner and shall have UL/CSA label affixed to rooftop package.
 - 1. In the event the unit is not UL/CSA approved, the manufacturer shall, at his expense, provide for a field inspection by a UL/CSA representative to verify conformance to UL/CSA standards. If necessary, contractor shall perform required modifications to the unit to comply with UL/CSA, as directed by the UL/CSA representative, at no additional expense to the Owner.

1.12 EXTRA MATERIALS

- A. Provide one additional set of filters.
- B. Furnish one complete set per applicable motor of fan motor drive belts.

1.13 QUALITY ASSURANCE

- A. Unit meets ASHRAE 90.1-2016 and IECC1-2015 minimum efficiency requirements.

¹IECC is a registered trademark of the International Code Council, Inc.

- B. Units are Energy Star certified where sizes are required.
- C. Unit shall be rated in accordance with AHRI Standard 340/360.
- D. Unit shall be designed to conform to ASHRAE 15.
- E. Unit shall be ETL-tested and certified in accordance with ANSI Z21.47 Standards and ETL-listed and certified under Canadian standards as a total package for safety requirements.
- F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- G. Unit internal insulation linings shall be resistant to mold growth in accordance with "mold growth and humidity" test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the "Erosion Test" in UL 181, as part of ASTM C1071.
- H. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- I. Roof curb shall be designed to conform to NRCA Standards.
- J. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
- K. Unit shall be designed in accordance with UL Standard 1995, including tested to withstand rain.
- L. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
- M. Unit shall be tested to assurance level 1, ASTM D4169 to ensure shipping reliability.
- N. High-Efficiency Motors listed shall meet section 313 of the Energy Independence and Security Act of 2007 (EISA 2007).

1.14 SUMMARY

- A. The Contractor shall furnish and install packaged rooftop air conditioning unit(s) as shown and as scheduled on the contract documents. The unit(s) shall be installed in accordance with this specification and perform at the conditions specified, scheduled or as shown on the contract

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drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. General

1. Manufacturer of packaged unitary rooftop products shall have had a minimum of five years successful experience in the manufacture and service support of the rooftop packages specified herein. Manufacturers with less than five years experience in the production of rooftop units of the sizes and types specified shall not be acceptable.

B. Approved Manufacturers

1. Carrier Corporation
2. Johnson Control
3. Trane

2.02 GENERAL UNIT DESCRIPTION

- A. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing hermetic scroll compressor(s) for cooling duty and gas combustion for heating duty.
- B. Factory assembled, single piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
- C. Unit shall use Puron® R-410A refrigerant.
- D. Unit shall be installed in accordance with the manufacturer's instructions.
- E. Unit must be selected and installed in compliance with local, state, and federal codes.

2.03 Operating characteristics:

- A. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 340/360 at ± 10% voltage.
- B. Compressor with standard controls shall be capable of operation from 35°F (2°C), ambient outdoor temperatures.

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Accessory kits are necessary if mechanically cooling at ambient temperatures below 35°F (2°C).

- C. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.
- D. Unit shall be factory configured and ordered for vertical supply and return configurations.
- E. Unit shall be factory furnished for either vertical or horizontal configuration without the use of special conversion kits.
- F. No field kits conversion is possible.

2.04 Electrical Requirements:

- A. Main power supply voltage, phase, and frequency must match those required by the manufacturer.

2.05 Unit Cabinet:

- A. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre-painted baked enamel finish on all externally exposed surfaces.
- B. Unit cabinet exterior paint shall be:
 - 1. film thickness, (dry) 0.003 inches minimum,
 - 2. gloss (per ASTM D523, 60°F): 60,
 - 3. Hardness: H-2H Pencil hardness.
- C. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1 1/2-lb density, flexible fiberglass insulation bonded with a phenolic binder, neoprene coated on the air side.
- D. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- E. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 340/360 minimum exterior sweat criteria.
 - 1. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1.5 lb density, flexible fiberglass insulation, neoprene coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the heat compartment.

- F. Unit internal insulation linings shall be resistant to mold growth in accordance with "mold growth and humidity" test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the "Erosion Test" in UL 181, as part of ASTM C1071.
- G. Base of unit shall have a minimum of four locations for factory thru-the-base electrical connections. Connections shall be internal to the cabinet to protect from environmental issues.
- H. Base Rail:
 - 1. Unit shall have base rails on a minimum of 2 sides.
 - 2. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
 - 3. Holes shall be provided in the base rail for moving the rooftop by fork truck.
 - 4. Base rail shall be a minimum of 16 gage thickness.
- I. Condensate pan and connections:
 - 1. Shall be a sloped condensate drain pan made of a non-corrosive material.
 - 2. Shall comply with ASHRAE Standard 62.
 - 3. Shall use a 3/4-in. 14 NPT drain connection at the end of the drain pan. Connection shall be made per manufacturer's recommendations.
- J. Top panel:
 - 1. Shall be a multi-piece top panel linked with water tight flanges and interlocking systems.
- K. Electrical Connections:
 - 1. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
- L. Thru-the-base capability:
 - 1. Thru-the-base provisions / connections are available as standard with every unit. When bottom connections are required, field furnished couplings are required.
 - 2. No basepan penetration, other than those authorized by
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the manufacturer, is permitted.

M. Component access panels (standard):

1. Cabinet panels shall be easily removable for servicing.
2. Unit shall have one factory installed, tool-less, removable, filter access panel.
3. Panels covering control box and filters shall have molded composite handles while the blower access door shall have an integrated flange for easy removal.
4. Handles shall be UV modified, composite, permanently attached, and recessed into the panel.
5. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.
6. Collars shall be removable and easily replaceable using manufacturer recommended parts.

2.06 (23 81 19.13.H.) Coils:

A. Aluminum Fin/Copper Tube Coils:

1. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
2. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
3. Corrosion durability of fin stock shall be confirmed through testing to have no visible corrosion after 48 hour immersion in a room temperature solution of 5% salt, 1% acetic acid.
4. Fin stock coating shall pass 2000 hours of the following: one week exposure in the prohesion chamber followed by one week of accelerated ultraviolet light testing. Prohesion chamber: the solution shall contain 3.5% sodium chloride and 0.35% ammonium sulfate. The exposure cycle is one hour of salt fog application at ambient followed by one hour drying at 95°F (35°C).

B. E-coated aluminum-fin evaporator and condenser coils:

1. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
2. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
3. Color shall be high gloss black with gloss per ASTM D523-89.
4. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
5. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.
6. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
7. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D224-92 and ASTM D870-92).
8. Corrosion durability shall be confirmed through testing to be no less than 6000 hours salt spray per ASTM B117-90.

2.07 Refrigerant components:

- A. Refrigerant circuit shall include the following control, safety, and maintenance features:
 1. Thermostatic Expansion Valve (TXV) shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
 2. Refrigerant filter drier.
 3. Service gage connections on suction and discharge lines.
 4. Pressure gage access through a specially designed access port in the top panel of the unit.
- B. There shall be gage line access port in the skin of the rooftop, covered by a black, removable plug:
 1. The plug shall be easy to remove and replace.

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2. When the plug is removed, the gage access port shall enable maintenance personnel to route their pressure gage lines.
3. This gage access port shall facilitate correct and accurate condenser pressure readings by enabling the reading with the compressor access panel on.
4. The plug shall be made of a leak proof, UV-resistant, composite material.

C. Compressors:

1. Unit shall use one fully hermetic, scroll compressor for each independent refrigeration circuit.
2. Models shall be available with 2 compressor/2-stage cooling.
3. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
4. Compressors shall be internally protected from high discharge temperature conditions.
5. Compressors shall be protected from an over-temperature and over-amperage conditions by an internal, motor overload device.
6. Compressor shall be factory mounted on rubber grommets.
7. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
8. Crankcase heaters shall be utilized on all models to protect compressor with specific refrigerant charge.

2.08 Filter section:

- A. Filters access is specified in the unit cabinet section of this specification.
- B. Filters shall be held in place by a preformed slide out filter tray, facilitating easy removal and installation.
- C. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.
- D. Filters shall be standard, commercially available sizes.

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- E. Only one size filter per unit is allowed.
- F. 4-in. filter capability is possible with a field-installed pre-engineered slide out filter track accessory. 4-in. filters are field furnished.

2.09 Evaporator fan and motor:

A. Evaporator fan motor:

- 1. Shall have permanently lubricated bearings.
- 2. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
- 3. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.

B. Belt-driven evaporator fan:

- 1. Belt drive shall include an adjustable-pitch motor pulley and belt break protection system.
- 2. Shall use rigid pillow block bearing system with lubricate fittings at are accessible or lubrication line.
- 3. Blower fan shall be double-inlet type with forward-curved blades.
- 4. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
- 5. Standard on all 17-28 size models with Humidi-MiZer system.

2.10 Condenser Fans and Motors:

A. Condenser fan motors:

- 1. Shall be a totally enclosed motor.
- 2. Shall use permanently lubricated bearings.
- 3. Shall have inherent thermal overload protection with an automatic reset feature.
- 4. Shall use a shaft down design on all sizes.

B. Condenser fans:

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1. Shall be a direct driven propeller type fan.
2. Shall have aluminum blades riveted to corrosion resistant steel spiders and shall be dynamically balanced.

2.11 (23 81 19.13.M.) Special features, options, and accessories:

A. Staged Air Volume System (SAV™) for 2-stage cooling units:

1. Evaporator fan motor:
 - a. Shall have permanently lubricated bearings.
 - b. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating.
 - c. Shall be Variable Frequency duty and 2-speed control.
 - d. Shall contain motor shaft grounding ring to prevent electrical bearing fluting damage by safely diverting harmful shaft voltages and bearing currents to ground.
2. Variable frequency drive (VFD). Only available on 2-speed indoor fan motor option (SAV):
 - a. Factory-supplied VFDs qualify, through ABB for a 24-month warranty from date of commissioning or 30 months from date of sale, whichever occurs first.
 - b. Shall be installed inside the unit cabinet, mounted, wired and tested.
 - c. Shall contain Electromagnetic Interference (EMI) frequency protection.
 - d. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
 - e. Self diagnostics with fault and power code LED indicator. Field accessory Display Kit available for further diagnostics and special setup applications.
 - f. RS485 capability standard.

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- g. Electronic thermal overload protection.
 - h. 5% swinging chokes for harmonic reduction and improved power factor.
 - i. All printed circuit boards shall be conformal coated.
- B. Integrated EconoMi\$er® IV, EconoMi\$er 2, and EconoMi\$er X low leak rate models. (Factory-installed on 3-phase models only. Field installed on all 3 and 1-phase models):
- 1. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - 2. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
 - 3. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
 - 4. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - 5. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
 - 6. Low leak rate models shall be equipped with dampers not to exceed 2% leakage at 1 in. wg pressure differential.
 - 7. Economizer controller on EconoMi\$er IV models shall be Honeywell W7212 that provides:
 - a. Combined minimum and DCV maximum damper position potentiometers with compressor staging relay.
 - b. Functions with solid state analog enthalpy or dry bulb changeover control sensing.
 - c. LED indicators for: when free cooling is available, when module is in DCV mode, when exhaust fan contact is closed.
 - 8. Economizer controller on EconoMi\$er X models shall be
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the Honeywell W7220 that provides:

- a. 2-line LCD interface screen for setup, configuration and troubleshooting.
- b. On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
- c. Sensor failure loss of communication identification.
- d. Automatic sensor detection.
- e. Capabilities for use with multiple-speed indoor fan systems.
- f. Utilize digital sensors: Dry bulb and Enthalpy.
- g. Economizer controller on EconoMiSer 2 models with PremierLink™ controller shall be 4 to 20mA design and controlled by the PremierLink controller. PremierLink does not comply with California Title 24 Fault Detection and Diagnostic (FDD) requirements.
- h. Economizer controller on EconoMiSer 2 models with RTU Open controller shall be a 4 to 20mA design controlled directly by the RTU Open controller. RTU Open controller meets California Title 24 Fault Detection and Diagnostic (FDD) requirements.
- i. Shall be capable of introducing up to 100% outdoor air.
- j. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1-2016 and IECC-2015 requirements.
- k. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
- l. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40°F to 100°F (4°C to 38°C).

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Additional sensor options shall be available as accessories.

- m. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
 - n. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
 - o. Dampers shall be completely closed when the unit is in the unoccupied mode.
 - p. Economizer controller shall accept a 2 to 10 Vdc CO2 sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
 - q. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F. Others shall open at 35°F (2°C) and close at 50°F (10°C).
 - r. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
 - s. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
9. Integrated EconoMi\$er2, and EconoMi\$er X Ultra Low Leak rate models. (Factory-installed on 3 phase models only. Field-installed on all 3 and 1 phase models):
- a. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - b. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
 - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on

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intake or return shall not be acceptable.

- d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
 - f. Ultra Low Leak design meets California Title 24 section 140.4 and, ASHRAE 90.1-2016 and IECC-2015 requirements for 4 cfm per sq. ft. on the outside air dampers and 10 cfm per sq. ft. on the return dampers.
10. Economizer controller on EconoMi\$er X models shall be the Honeywell W7220 that provides:
- a. 2-line LCD interface screen for setup, configuration and troubleshooting
 - b. On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
 - c. Sensor failure loss of communication identification.
 - d. Automatic sensor detection.
 - e. Capabilities for use with multiple-speed indoor fan systems.
 - f. Utilize digital sensors: Dry bulb and Enthalpy.
 - g. Economizer controller on EconoMi\$er 2 models with RTU Open controller shall be a 4 to 20mA design controlled directly by the RTU Open controller. RTU Open controller meets California Title 24 Fault Detection and Diagnostic (FDD) requirements.
 - h. Shall be capable of introducing up to 100% outdoor air.
 - i. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1-2016 and IECC-2015 requirements.

- j. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
 - k. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40°F to 100°F (4°C to 38°C). Additional sensor options shall be available as accessories.
 - l. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
 - m. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
 - n. Dampers shall be completely closed when the unit is in the unoccupied mode.
 - o. Economizer controller shall accept a 2 to 10 Vdc CO2 sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
 - p. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F (0°C). Others shall open at 35°F (2°C) and closes at 50°F (10°C).
 - q. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
 - r. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
11. Two-Position Damper (Factory-installed on 3 Phase Models Only. Field-installed on all 3 and 1 Phase Models):
- a. Damper shall be a Two-Position Motorized Damper. Damper travel shall be from the full closed

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position to the field adjustable %-open setpoint.

- b. Damper shall include adjustable damper travel from 25% to 100% (full open).
- c. Damper shall include single or dual blade, gear driven dampers and actuator motor.
- d. Actuator shall be direct coupled to damper gear. No linkage arms or control rods shall be acceptable.
- e. Damper will admit up to 100% outdoor air for applicable rooftop units.
- f. Damper shall close upon indoor (evaporator) fan shutoff and/or loss of power.
- g. The damper actuator shall plug into the rooftop unit's wiring harness plug. No hard wiring shall be required.
- h. Outside air hood shall include aluminum water entrainment filter.

12. Manual damper:

- a. Manual damper package shall consist of damper, air inlet screen, and rain hood which can be preset to admit up to 50% outdoor air for year round ventilation.

13. Humidi-MiZer® Adaptive Dehumidification System:

- a. The Humidi-MiZer Adaptive Dehumidification System shall be factory-installed and shall provide greater dehumidification of the occupied space by two modes of dehumidification operations beside its normal design cooling mode:
 - 1) Subcooling mode further subcools the hot liquid refrigerant leaving the condenser coil when both temperature and humidity in the space are not satisfied.
 - 2) Hot gas reheat mode shall mix a portion of the hot gas from the discharge of the compressor with the hot liquid refrigerant leaving the condenser coil to create a two-phase heat transfer in the system,

resulting in a neutral leaving-air temperature when only humidity in the space is not satisfied.

3) Includes head pressure controller.

14. Head pressure control package (Motormaster®):

- a. Controller shall control coil head pressure by condenser fan speed modulation or condenser fan cycling and wind baffles.
- b. Shall consist of solid state control and condenser coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to -20°F (-29°C).

10. Low Ambient Controller (Factory-installed only):

- c. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.
- d. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to 0°F (-18°C).

15. Condenser Coil Hail Guard Assembly (Factory-installed option on 3 phase models. Field-installed on all 3 and 1 phase models):

- a. Shall protect against damage from hail.
- b. Shall be louvered style design.

16. Unit-mounted, non-fused disconnect switch:

- a. Switch shall be factory-installed, internally mounted.
- b. National Electric Code (NEC) and UL approved non-fused switch shall provide unit power shutoff.
- c. Shall be accessible from outside the unit.
- d. Shall provide local shutdown and lockout capability.

- e. Sized only for the unit as ordered from the factory. Does not accommodate field-installed devices.

17. HACR Breaker:

- a. These manual reset devices provide overload and short circuit protection for the unit. Factory wired and mounted with the units, with access cover to help provide environmental protection. On 575V applications, HACR breaker can only be used with WYE power distribution systems. Use on Delta power distribution systems is prohibited.
- b. Sized only for the unit as ordered from the factory. Does not accommodate field-installed devices.

18. Convenience outlet:

- a. Powered convenience outlet.
 - 1) Outlet shall be powered from main line power to the rooftop unit.
 - 2) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be UL certified and rated for additional outlet amperage.
 - 3) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
 - 4) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
 - 5) Voltage required to operate convenience outlet shall be provided by a factory-installed step down transformer.
 - 6) Outlet shall be accessible from outside the unit.
 - 7) Outlet shall include a field-installed "Wet in Use" cover.

8) Fan/Filter Status Switch:

19. Switch shall provide status of indoor evaporator fan (ON/OFF) or filter (CLEAN/DIRTY).
 - a. Status shall be displayed either over communication bus (when used with direct digital controls) or with an indicator light at the thermostat.
20. Thru-the-base connectors:
 - a. Kits shall provide connectors to permit electrical connections to be brought to the unit through the unit basepan.
 - b. Minimum of three connection locations per unit.
 - c. Propeller power exhaust:
 - d. Power exhaust shall be used in conjunction with an integrated economizer.
 - e. Independent modules for vertical or horizontal return configurations shall be available.
 - f. Horizontal power exhaust shall be mounted in return ductwork.
 - g. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
21. Roof curbs (vertical):
 - a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
 - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
 - c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
22. Adapter Curb (Vertical):

- a. Full perimeter, fully assembled and welded roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
- b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
- c. Permits installation of new 50HC 17-28 models to past Carrier design curb models: DP,DR,HJ,TM, and TJ. Check with Carrier sales expert of further details and information.

23. Outdoor air enthalpy sensor:

- a. The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.

24. Return air enthalpy sensor:

- a. The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.

25. Indoor air quality (CO2) sensor:

- a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
- b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The setpoint shall have adjustment capability.

26. CO2 sensor (EnergyX):

- a. The modulating airflow energy recovery unit shall be capable of incorporating a CO2 sensor for use with Demand Controlled Ventilation.
- b. The CO2 sensor shall connect to the base rooftop unit's digital controller.
- c. The modulating airflow energy recovery unit shall use at a minimum, a high and low CFM airflow set point when a CO2 sensor is used.

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27. Winter start kit:
- a. Shall contain a bypass device around the low pressure switch.
 - b. Shall be required when mechanical cooling is required down to 25°F (-4°C).
 - c. Shall not be required to operate on an economizer when below an outdoor ambient of 40°F (4°C).
28. Time guard:
- a. Shall prevent compressor short cycling by providing a 5 minute delay (±2 minutes) before restarting a compressor after shutdown for any reason.
 - b. One device shall be required per compressor.
29. Condensate Overflow Switch:
- a. This sensor and related controller monitors the condensate level in the drain pan and shuts down compression operation when overflow conditions occur. It includes:
 - 1) Indicator light - solid red (more than 10 seconds on water contact - compressors disabled), blinking red (sensor disconnected).
 - 2) 10 second delay to break - eliminates nuisance trips from splashing or waves in pan (sensor needs 10 seconds of constant water contact before tripping).
 - 3) Disables the compressor(s) operation when condensate plug is detected, but still allows fans to run for Economizer.
30. Barometric Hood (Horizontal Economizer Applications):
- a. Shall be required when a horizontal economizer and barometric relief are required. Barometric relief damper must be installed in the return air (horizontal) duct work. This hood provides weather protection.
31. Hinged Access panels:

- a. Shall provide easy access through integrated quarter turn latches.
- b. Shall be on major panels of filter, control box, fan motor and compressor.

32. Display kit for variable frequency drive:

- a. Kit allows the ability to access the VFD controller programs to provide special setup capabilities and diagnostics.
- b. Kit contains display module and communication cable.
- c. Display Kit can be permanently installed in the unit or used on any SAV system VFD controller as (23 09 13.23) Sensors and Transmitters

2.12 Thermostats

A. Thermostat must

- 1. energize both "W" and "G" when calling for heat.
- 2. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
- 3. include capability for occupancy scheduling.

2.13 RTU Open protocol, direct digital controller:

- A. Shall be ASHRAE 62 compliant.
- B. Shall accept 18-30VAC, 50-60Hz, and consume 15VA or less power.
- C. Shall have an operating temperature range from -40°F (-40°C) to 130°F (54°C), 10% to 90% RH (non-condensing).
- D. Shall include built-in protocol for BACnet2 (MS/TP and PTP modes), Modbus3 (RTU and ASCII), Johnson N2 and LonWorks. LonWorks Echelon processor required for all Lon applications shall be contained in separate communication board.
- E. Shall allow access of up to 62 network variables (SNVT). Shall be compatible with all open controllers.

³Modbus is a registered trademark of Schneider Electric.

- F. Baud rate Controller shall be selectable using a dip switch.
- G. Shall have an LED display independently showing the status of serial communication, running, errors, power, all digital outputs, and all analog inputs.
- H. Shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, compressor lock-out, fire shutdown, enthalpy switch, and fan status / filter status / humidity / remote occupancy.
- I. Shall provide the following outputs: economizer, variable frequency drive, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, exhaust reversing valve/high fan speed.
- J. Shall have built-in surge protection circuitry through solid-state polyswitches. Polyswitches shall be used on incoming power and network connections. Polyswitches will return to normal when the "trip" condition clears.
- K. Shall have a battery backup capable of a minimum of 10,000 hours of data and time clock retention during power outages.
- L. Shall have built-in support for Carrier technician tool.
- M. Shall include an RS-485 protocol communication port, an access port for connection of either a computer or a Carrier technician tool, an RS-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks communications card.
- N. Software upgrades will be accomplished by either local or remote download. No software upgrades through chip replacements are allowed.

2.14 ComfortLink Unit Controls shall contain:

- A. Four button detailed English scrolling marquee display.
- B. CCN (Carrier Comfort Network) capable.
- C. Unit control with standard suction pressure transducers and condensing temperature thermistors.
- D. Shall provide a 5°F temperature difference between cooling and heating set points to meet ASHRAE 90.1-2016 Energy

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Standard.

- E. Shall provide and display a current alarm list and an alarm history list.
- F. Service run test capability.
- G. Shall accept input from a CO2 sensor (both indoor and outdoor).
- H. Configurable alarm light shall be provided which activates when certain types of alarms occur.
- I. Compressor minimum run time (3 minutes) and minimum off time (5 minutes) are provided.
- J. Service diagnostic mode.
- K. Economizer control (optional).
- L. Control multiple capacity stages.
- M. Unit shall be complete with self-contained low voltage control circuit.
- N. Unit shall have 0°F low ambient cooling operation.

2.15 Decentralized, rooftop units

- A. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
- B. Shall utilize color-coded wiring.
- C. Shall include a central control terminal board to conveniently and safely provide connection points for vital control functions such as: smoke detectors, phase monitor, economizer, thermostat, DDC control options, and low and high pressure switches.
- D. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.

2.16 Safeties:

- A. Compressor over-temperature, over-current.
- B. Low-pressure switch:

1. Units shall have different sized connectors for the circuit 1 and circuit 2 low and high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
 2. Low pressure switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
- C. High-pressure switch.
1. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 low and high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
 2. Low pressure switch shall use different color wire than the high-pressure switch. The purpose is to assist the installer and service technician to correctly wire and/or troubleshoot the rooftop unit.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that proper power supply is available.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork. Install roof mounting curb level.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Manufacturer shall furnish a factory trained service engineer without additional charge to start the unit(s). Package rooftop unitary manufacturers shall maintain service capabilities no more than 100 miles from the jobsite.
- B. The manufacturer shall furnish an alternative price for:
 1. Extended compressor warranty for one years.
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- C. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

PART 4 - SEQUENCE OF OPERATIONS

4.01 PACKAGED ROOFTOP AIR CONDITIONING UNIT

- A. Each Commercial Rooftop Unit shall have a microprocessor-based controller which shall monitor and control the commercial rooftop unit in a stand-alone mode or as directed by the existing building automation system. The rooftop control panel shall have a human interface panel with a 2-line by 40-character clear English LCD display and a 16 button keypad for monitoring, setting, editing and controlling.
- B. The building automation system (BAS) shall perform the following rooftop control strategies, provide the points listed on the point list and provide the specified monitoring and diagnostics.
 - 1. Unoccupied Mode - When the BAS initiates the unoccupied mode, the rooftop shall assume the unoccupied heating and cooling setpoints. If the unoccupied setpoints are exceeded, the unit shall heat or cool until the zone temperature is within the unoccupied setpoints.
- C. Night Setback Temperature Control - During unoccupied hours, the rooftop unit shall be controlled by the BAS to maintain user-defined unoccupied heating and cooling setpoints. The outdoor air damper shall remain closed for night setback operation (unless economizing for zone cooling). The fan shall operate in the automatic control mode.
- D. Purge/Night Economizer - The purge mode shall turn on the fan and enable the economizer during unoccupied hours to cool a zone using cool night outdoor air. Through the BAS Time of Day Scheduling, the operator shall specify when the purge mode occurs. During the purge mode, the economizer shall be enabled while mechanical outdoor cooling and heating are disabled.
 - 1. Transition from Unoccupied to Occupied - When the unit transitions from the unoccupied operation to occupied operation, start-up or morning warm-up mode shall be activated.

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- E. Startup Mode - The rooftop unit can be controlled to the Startup mode by the BAS for Optimal Start purposes. During the Startup mode, heating and cooling are enabled for the Rooftop. On Variable Air Volume units, the transition from the Unoccupied to the Startup mode may initiate the Morning Warmup mode, if the space temperature is below the Morning Warmup setpoint. On both Constant Volume and Variable Air Volume units, the outdoor air damper shall remain closed, unless economizing, until the zone's scheduled occupied time.
- F. Morning Warmup (CV and VAV Units) - When the Rooftop shall change from the Unoccupied to the Occupied mode, the unit may enter the Morning Warmup mode. The Morning Warmup mode shall be initiated if the Morning Warmup sensor value is less than the Morning Warmup setpoint. The economizer (if supplied) shall be kept closed and the selected zone is heated. The BAS shall send the rooftop unit a Morning Warmup temperature and setpoint. The Morning Warmup setpoint shall be based on one specific zone designated by the operator or based on an average zone temperature.
1. Occupied Operation - When the rooftop unit is controlled to the Occupied mode, all rooftop unit functions shall be enabled. Variable Air Volume units shall operate in supply air temperature control mode, and Constant Volume units shall operate under zone temperature control. The rooftop unit shall default to this mode in the event that communications with the BAS are lost.
- G. Cooling/Economizer - During the Occupied cooling mode of operation the economizer, if available, and mechanical cooling are used to control the supply air temperature. If the enthalpy of the outdoor air is appropriate to use free cooling the economizer shall be used to satisfy the supply air setpoint. If more cooling is then required, compressors shall be staged on as necessary. Minimum On/Off timing of the compressors shall prevent rapid cycling. If the unit does not include an economizer, mechanical cooling only shall be used to satisfy cooling requirements. At outdoor air conditions above the enthalpy control setting, mechanical cooling only shall be used and the fresh air dampers shall remain at minimum position.
- H. Supply Air Setpoint (Variable Air Volume Units) - The supply air setpoint for each rooftop unit shall be defined by the user at the BAS or reset automatically based on an outdoor air or zone temperature.
1. Daytime Warmup (VAV Units) - When the zone temperature
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drops below an operator-specified Daytime Warmup setpoint, the rooftop shall enter the Daytime Warmup mode. In this mode, the rooftop shall supply heat to the VAV boxes by driving the VAV boxes fully open and the inlet guide vanes or variable frequency drive(s) are driving to 100 percent. After the zone is warmed up, the unit shall resume normal cooling. The BAS shall communicate the Daytime Warmup temperature value for the Rooftop to use to initiate the necessary heating for the zone.

2. Multiple Unit Zone Control (Constant Volume Units) - When multiple rooftop units are supplying a common area, the BAS shall provide heat/cool arbitration for all of the units in that common area. This shall ensure that simultaneous heating and cooling do not occur when multiple units are serving a common area.
3. Economizer Control (CV and VAV Units) - The BAS shall override the economizer controller on the rooftop unit to provide free cooling. If poor outdoor air conditions exist, the BAS shall lockout all economizers. On constant volume units the BAS shall also set the minimum economizer position to maintain a minimum outdoor air flow (cfm). On VAV units, as the supply fan modulates down, the minimum economizer position shall also be reset to compensate for the reduction in total airflow.
4. Demand Limit - The BAS will automatically turn off loads when it predicts that electrical demand will exceed specified limits. The operator can assign priority for each load to be turned off. The capacity can be reduced to 50% or zero mechanical cooling or heating. Ventilation can be set up as Enabled or Disabled in the Demand Limit mode. For constant volume units, the fan can be set up as On or Auto. The BAS can also apply setpoint offsets to the current heating and cooling setpoints for constant volume units during the Demand Limit mode.
5. Ventilation Override - The operator shall be able to customize up to five different override sequences to provide ventilation override control. The BAS control of the ventilation override mode shall be used to coordinate the entire HVAC system in response to system ventilation requests. If more than one ventilation override sequence is requested, the sequence with the highest priority shall be initiated by the rooftop unit control.

6. Timed Override - When a Timed Override is initiated by the user, the rooftop unit shall return to its normal occupied mode for a period of time as specified at the BAS. When the Timed Override period has ended, the unit shall automatically return to its unoccupied cycle. The BAS shall monitor and store the override time for each Timed Override input for documentation of after-hours operation. The BAS shall also recognize a Timed Override function if provided.
7. Coastdown Mode - Before the Rooftop unit is controlled to the Unoccupied mode, the BAS shall initiate the Coastdown or Optimal Stop mode. During the Optimal Stop mode, the supply fan shall remain on, the outdoor air damper shall remain open for ventilation, and the mechanical cooling and heating shall be disabled. The unit shall remain in the Coastdown mode until the scheduled Unoccupied time.

The BAS shall turn equipment off as early as possible before the unoccupied time to reduce energy consumption, while still maintaining comfort in the zone.

8. Shutdown - The BAS Priority Control program shall be able to put the zone in either the Shutdown or Occupied mode. All units which are members of that zone shall be immediately put in the Shutdown or Occupied mode. In the Shutdown mode, the unit shall turn off as rapidly as possible with all cooling and heating disabled, and the outdoor air damper shall be closed.
 9. Space Pressure Control - The space pressure control shall turn the exhaust fans on and off, and shall modulate the exhaust dampers to maintain a slightly positive indoor static pressure. The BAS shall also control multiple units in a common area to provide uniform static pressure. The BAS shall also monitor the building static pressure sensor differential.
 10. Supply Air Pressure Control (VAV Units) - The BAS shall send supply air pressure setpoints to the rooftop to modulate the Inlet Guide Vanes or Variable Frequency Drive(s) based on the static pressure sensor located in the supply air duct. The BAS shall also read the status on the supply air sensor and display the pressure reading on the status screen.
- I. An optional temperature sensor shall be connected to the ventilation control module to enable it to control a field-

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installed pre-heater.

- J. An optional CO2 sensor shall be connected to the ventilation control module to control CO2 reset.
1. The fresh outdoor air shall enter the rooftop unit through the air flow monitoring station/damper sensor assembly and shall be measured by velocity pressure flow rings. The velocity pressure flow rings shall be connected to a pressure transducer/solenoid assembly. The ventilation control module shall utilize the velocity pressure input, the outdoor air temperature input, and the minimum outdoor air CFM setpoint to modify the volume (CFM) of fresh air entering the unit as the measured airflow deviates from setpoint. When the optional temperature sensor is installed and the Preheat function is enabled, the sensor shall monitor the combined (averaged) fresh air and return air temperatures. As this mixed air temperature falls below the preheat Actuate Temperature Setpoint, the ventilation control module shall activate the preheat binary output used to control a field installed heater. The output shall be de-activated when the temperature rises 5 above the Preheat Actuate Temperature Setpoint. When the optional CO2 sensor is installed and the CO2 Reset is enabled, as the CO2 concentration increases above the CO2 Reset Start Value, the Ventilation Control Module shall modify the minimum outdoor air CFM setpoint to increase the amount of fresh air entering the unit. The setpoint shall be adjusted upward until the CO2 Maximum Reset value is reached. The maximum effective (reset) setpoint value for fresh air entering the unit is limited to the maximum rated air flow for the unit. As the CO2 concentration decreases, the effective (reset) setpoint value shall be adjusted downward toward the minimum outdoor air CFM setpoint.
- K. Unit Status Report - For each rooftop unit, the BAS shall provide an operating status summary of the following information to provide the operator with critical rooftop operating data.
1. Unit type and size
 2. Operating mode
 3. Active rooftop diagnostics
 4. Active cooling mode

5. Active cooling/supply air setpoint
 6. Supply air temperature
 7. Space temperature
 8. Supply fan status
 9. Supply fan percent modulation
 10. Exhaust fan status
 11. Exhaust fan percent modulation
 12. Active space pressure
 13. Active supply air pressure
 14. Compressor on/off status
 15. Condenser on/off status
 16. Return air temperature
 17. Return air relative humidity
 18. Economizer status
 19. Economizer position - percent
 20. Minimum outdoor air CCFM setpoint
 21. Carbon Dioxide concentration - percent (optional)
 22. Outdoor air flow
- L. Diagnostics - The BAS system shall be able to alarm from all sensed points from the rooftop units and diagnostic alarms sensed by the unit controller. Alarm limits shall be designated for all sensed points.
1. Individual rooftop diagnostic and alarm statuses shall include the following latching items for each rooftop unit:
 - a. Emergency stop
 - b. Supply fan failure
 - c. Exhaust fan failure
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- d. Compressor trip (each circuit)
 - e. Freezestat Trip
 - f. Manual supply air static pressure limit
 - g. Compressor contactor fail (each circuit)
2. Individual rooftop diagnostic and alarm statuses shall include the following non-latching items for each rooftop unit:
- a. Zone temperature sensor failure
 - b. Supply air temperature sensor failure
 - c. Auxiliary temperature sensor failure
 - d. Outdoor air temperature sensor failure
 - e. Occupied zone cool/heat setpoint failure
 - f. Supply air pressure sensor failure
 - g. Outdoor air humidity sensor failure
 - h. Evaporator temperature sensor failure (each circuit)
 - i. Condenser Temperature sensor failure (each circuit)
 - j. Morning warm-up zone sensor fail
 - k. Heat failure
 - l. Unoccupied zone cool/heat setpoint failure
 - m. Supply air pressure setpoint failure
 - n. Space static pressure setpoint failure
 - o. Space pressure sensor failure
 - p. Return air temperature sensor failure
 - q. Return air humidity sensor failure
 - r. Auto supply air static pressure limit

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- s. Unit communications loss
- t. Heat communications failure
- u. Night setback panel communications failure
- v. Ventilation override mode communications loss
- w. Supply air temperature cool/heat setpoint fail
- x. Dirty filter
- y. Night setback zone temperature sensor fail

END OF SECTION 237405

SECTION 220500 - COMMON WORK RESULTS FOR PLUMBING

1.1 SCOPE AND INTERPRETATION

- A. These Specifications and accompanying Drawings provide for the furnishing, setting and connection of roof drain, storm piping and plumbing vent.
- B. The specifications and Drawings require the Contractor to provide all labor, materials, equipment and appliances to perform of all Work pertaining or incidental thereto, which is needed to complete the Work shown on the Drawings and called for in the Specifications.
- C. Scope of Work: The plumbing and drainage work of this contract shall include but shall not be limited to the following systems, equipment and services:
 - 1. Vent piping: Vent piping terminate on roof shall extend minimum of 18'' above finish roof. Where roof vent terminal is within 10' horizontally of any window or air intake opening, it shall extend minimum of 3' above such opening.
 - 2. Storm Water Drainage Piping: Replace existing storm drain and leader as indicated on drawings.
 - 3. Piping, and seismic restraints: To comprise all restraints, hangers, pipe guides, rods, beam clamps, brackets, pipe anchors, other attachments, floor flanges, masonry anchors, bolts, nuts, washers, and other items as required to fully support all piping, gas venting, and equipment installed under this contract inclusive of spring hangers, seismic restraints, where required to meet noise abatement regulations and as necessary to prevent piping vibrations being transmitted to structure.
 - 4. Piping - General: Piping, piping installation or hook-up shall mean a complete installation in all respects including pipe, fittings and other miscellaneous items to make piping systems and equipment operational.
 - 5. Miscellaneous Work: Included shall be all items of materials, piping, controls, wiring and other miscellaneous items not specifically shown on Contract Drawings or called for herein but which are normally furnished and required for a complete installation of this type.

1.2 CODES AND STANDARDS

- A. It shall be unlawful for any person to perform the work referred to under this Plumbing and Drainage Specifications and/or shown on the Plumbing and Drainage Contract Drawings

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unless such person is a licensed master plumber, partnership, corporation or other business association as permitted by the NYS Building Code and unless such work is performed under the direct and continuing supervision of a licensed master plumber.

- B. Where requirements for products, materials, systems, equipment, methods and other portion of the work specified herein exceed minimum requirements of regulatory agencies having jurisdiction over the construction work, contractor shall comply with such requirements specified herein, unless specifically approved otherwise by the Authority.

1.3 GUARANTEES AND WARRANTIES

- A. Contractor's Guarantees: The Contractor guarantees that all Work of this Contract is free from all defects, and is as specified, and that should any defects, which cannot be proven to have been caused by improper use, develop within the space of one year from the date of substantial completion of the Work, such defects shall be made good by the Contractor, free of cost to the owner or authorities.
- B. Manufacturer's Warranty: Hermetically sealed compressor units for water coolers, or any other equipment mechanically refrigerated, shall have a five-year warranty. This warranty shall cover the replacing the hermetically sealed compressor unit if it shall become defective within 5 years from the date as defined in the General Conditions. It shall be replaced free of charge, by the manufacturer, to the Authority.

1.4 SUBMITTALS

- A. Formal submission for approval of manufacturer is not required if the Contractor provides equipment as per manufacturer/model number or series listed in the specification. Formal submissions are also not required for materials and appurtenances (ex. sheet metal, pipes, etc.) if the Contractor provides items as defined in the specification. In this case, Contractor must submit affidavit (for record purposes only) stating that listed equipment and/or items as defined in the specification will be provided. Submittals are mandatory for certain critical items and will be so noted in the respective specifications. Submittals are always required to verify capacity. Schedules, installation instructions, startup manuals, operation and maintenance manuals, and shop drawings are always required to be submitted.

1.5 CLEANING AND REPAIR

- A. At the completion of the Work and before the final inspection is made the Contractor shall thoroughly clean all fixtures, apparatus, appurtenances, piping, brass and chrome and nickel-plated work, marble and stone work, and leave

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these items free from all marks, scratches, stains, and other damage. All pumps, filters, heaters, and other equipment shall be cleaned and left in condition to operate, and the work, as a whole, left in perfect working order. Remove all tools, debris and excess materials from the premises.

- B. Contractor shall not leave sharp exposed metal edges (bottom of threaded rods, P&D equipment supports, etc.) that could otherwise present safety hazards to the building's occupants/work staff.

END OF SECTION

SECTION 220529 -HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of hangers and support Work is indicated by the requirements of this Section.

1.2 SUBMITTALS

- A. Submit catalog cuts for each different type of hanger and rod, support and accessory.
- B. Submit method of support and hanging for Engineers approval prior to installation.

1.3 QUALITY ASSURANCE

- A. No-Hub piping shall be installed and supported in full compliance with Local Law 100 of 1989.
- B. Cast-Iron Soil Pipe Institute (CISIP) Designation B10-1985 and Designation 301-1985.
- C. Manufacturers Standardization Society of The Valve and Fittings Industry (MSS) Compliance: Comply with:
 - MSS SP-58 Pipe Hangers and Supports - Materials, Design and Manufacture.
 - MSS SP-69 Pipe Hangers and Supports - Selection and Application.
 - MSS SP-89 Pipe Hangers and Supports - Fabrication and Installation Practices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pipe Hangers:

- a. AAA Technology and Specialties Co., Inc.
- b. ANVIL International
- c. B-Line Systems, Inc.
- d. Carpenter & Patterson, Inc.
- e. Empire Tool & Manufacturing Co., Inc.
- f. Globe Pipe Hanger Products, Inc.
- g. Grinnell Corp.
- h. GS Metals Corp.
- i. Michigan Hanger Co., Inc.

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- j. National Pipe Hanger Corp.
- k. PHD Manufacturing, Inc.
- l. PHS Industries, Inc.
- m. Piping Technology & Products, Inc.
- n. OR other approved equals

2.2 MATERIALS

A. Pipe Hangers and Supports

- 8. Storm drainage leader piping running exposed along the outside face of building wall shall be supported by offset pipe clamp of carbon steel; Anvil International Fig. 103 or the approved equal of Carpenter & Paterson, Inc, Hilti Inc or Cooper B-Line, Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Supports shall be adequate to securely support the piping and its contents, to prevent vibration and to provide proper allowance for expansion and contraction of the piping.
- B. All piping running close to or on walls shall be supported by means of hanger suspended from heavy angle iron wall brackets. No wall hooks will be permitted.
- C. Intervals of supports for vertical piping shall be as follows:
 - 1. Cast iron storm drainage leader piping exposed along outside face of building wall: At base and at 5' intervals and 18" behind each hub or joint.
- C. Cleaning, painting and installation of hangers and supports shall be done before the application of fireproofing material. All hanger and support assemblies in their entirety shall be rust proofed and painted. For material and method of painting, refer to Section 09900 - Painting.

END OF SECTION

LIST OF SUBMITTALS

SUBMITTAL	DATE SUBMITTED	DATE APPROVED
Product Data:		
1.Pipe Supports	_____	_____

* * *

SECTION 221000 -PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of plumbing piping work is indicated on Drawings and by the requirements of this Section including but is not limited to the following:

1. Pipe
2. Fittings
3. Piping Joints

1.2 CODES AND STANDARDS

- A. Comply with applicable portions of the Building Code of the State of New York. Where requirements for products, materials, equipment, methods and other portion of the work specified herein exceed minimum requirements of NYS Building Code, contractor shall comply with such requirements specified herein, unless specifically approved otherwise by the Authority.

- B. Standards listed below are referenced in this section.

1. American Society for Testing and Materials (ASTM)
2. American Standards Association (ASA)
3. American National Standards Institute (ANSI)
4. United States of America Standards Institute (USASI)
5. Cast Iron Soil Pipe Institute (CISPI)
6. American Water Works Association (AWWA)
7. NSF International

- C. Approved Agency Certification: Certification and listing by an Approved Agency in accordance with NYS Dept. of Buildings rules, indicating that the materials and assemblies as regulated by the NYS Building Code are acceptable for the intended use. When test methods are stipulated in the NYC Building Code, the tests utilized shall be stated in the Certification. Prior MEA approvals are acceptable for materials and assemblies conforming to current Code requirements

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1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipe materials properly protected, and undamaged.
- B. Properly protect all piping so as to prevent damage to the pipe or the introduction of foreign material into the pipe. For the purpose of protecting piping from pre-installation contamination, all piping shall be shipped to job site with suitable caps, sheet metal covers or plugs. Pipe caps shall not be removed until just before installation.
- C. Examine all pipe and fittings before laying. Do not install any piece that is found to be defective.

1.4 SUBMITTALS

- A. Product Data
 - 3. Pipes & fittings
- B. Submit Shop Drawings for all piping installations.
- C. Pipe Schedule: Itemize pipe and fitting materials for each specified application.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Piping shall conform to the following:

- 1. Cast-iron Pipe

- a. Bell and Spigot ends:

Evenly coated, cylindrical, smooth, free from all defects, of uniform thickness and of the weights required by the New York State rules governing Plumbing and Drainage, and shall be of the grade known in commerce as "service weight". Each length of pipe and each fitting shall be plainly marked with the manufacturer's name or registered trademark and with the letters "SV" to indicate "Service weight". The marking may be cast, stenciled, or otherwise applied on the pipe so as to be clear and legible at the time of installation. The marking shall be cast on fittings and shall be located away from the spigot end so as not to interfere with proper joining upon installation. Cast-iron soil pipe and fittings shall comply with ASTM A74;

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b. No-Hub:

Evenly coated, cylindrical, smooth, free from all defects, of uniform thickness and of the weights required by the New York City rules governing Plumbing and Drainage. Each length of pipe and each fitting shall be plainly marked with the manufacturer's name or registered trademark. The marking may be cast, stenciled, or otherwise applied on the pipe, and cast on fittings so as to be clear and legible at the time of installation. Cast-iron soil pipe and fittings for hubless cast iron sanitary system shall comply with CISPI Standard 301, and ASTM A888, latest edition.

B. Fittings and Joints

1. Cast-iron Hub and Spigot Piping:

- a. Fitting shall be service weight pattern, evenly coated, manufactured in accordance with the current ASTM A74 and shall correspond with the pipe in all particulars.
- b. Material used for Hub and Spigot caulked joints shall be molten lead and packed oakum.

2. Cast-iron No-Hub Piping (Hubless Coupling)

- a. Cast iron No-Hub pipe fittings shall be made up to comply with CISPI Standard 301 and ASTM A888. No-Hub coupling gaskets shall conform to ASTM C564. Each approved coupling shall be permanently marked on its external surface with: manufacturer's name or trade mark, nominal pipe size, and shall meet pressure testing standards set in ASTM C1540.
- b. Stainless steel couplings shall be heavy duty with shield of 28 gauge 304, 18-8 chromium nickel stainless steel, neoprene gasket and stainless steel bolts and bands and shall conform to ASTM C1540.

Couplings shall be HI-Torque 80 by Clamp-All Corp., with two (2) clamps for pipe sizes up to and including 4" and four (4) clamps for pipe 5" to 10"; or Husky HD-2000 by Husky Technologies Division of ANACO with four (4) clamps for pipe sizes up to and including 4" and six (6) clamps for sizes 5" to 10" or Mission HW Series by Mission

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Rubber Company, with four (4) clamps for pipes up to and including 4" and six (6) clamps for pipes 5" to 10"; or POC coupling by Thermafit Industries.

PART 3 - EXECUTION

3.1 PIPE AND FITTING SCHEDULE

A. Storm Piping: Above - Interior

Hubless Service Weight Cast Iron with mechanical stainless steel couplings.

B. Storm Piping: Exterior - Leader

Service Weight Cast Iron bell and spigot, water tight joints.

C. Vent: Above Ground

1. Hubless Service Weight Cast Iron with mechanical stainless steel couplings.

3.2 INSTALLATION

A. Piping (General)

1. The run and arrangements of all pipes shall be approximately as shown on drawings or specified and as directed during installation, and shall be as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and neatly spaced. All exposed risers shall be erected plumb, standing free, close to and parallel with walls and other pipes and be uniformly spaced.
2. For work in existing buildings the following addition requirements shall be adhered to:
 - a. Piping shall run as straight as possible with the fewest number of changes in direction, with such variations from the layout shown on the Drawings as conditions at the premises may require, as approved by the Authority at no extra cost to the Authority. Provide piping without sharp bends, quick changes of sections, pockets or bushings.
 - b. The locations of all existing piping which are indicated on the Drawings are approximate. The Contractor shall investigate and ascertain the

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exact locations of such piping and make whatever minor variations in runs of new piping that may be required at no extra cost to the Authority.

- c. Contractor shall consider the location of all equipment, ductwork, piping, electric conduits, supports, steel work, etc., and all new piping shall be installed without interference therewith.
- d. Wherever existing branch piping interfere with installation of new branch piping, the existing branch piping shall be removed and re-routed to accommodate the new work. The rerouted work shall be of new material.
- e. All new extensions and relocations of existing piping systems shall be concealed in existing or new walls, floors, ceilings, pipe chases or as otherwise specified.

B. Piping Joints

1. Cast iron bell and Spigot Type

- a. Joints in cast-iron bell and spigot piping shall be caulked joints made with packed oakum and molten lead, 12 ounces of which must be used for each inch in diameter of the pipes at each joint and must be poured in at one time. The lead to be used for this purpose shall be soft "Pig" or "Bar." After cooling and shrinking, the lead shall be thoroughly caulked and the joints made impermeable to gases and liquids, and also be capable of withstanding the tests applied. The face of the lead joints shall finish flush with the face of the hub and be left without putty, paints or cement. Whenever joints are made on the floor or surface they shall be re-caulked after being placed in position.

2. Joints in cast iron No-Hub pipe shall be heavy-duty type couplings. No-Hub cast iron pipe shall be cut square.

- a. The use of No-Hub pipe and fittings for soil, waste, vent and storm piping is PERMITTED when installed above ground within buildings.
- b. The use of No-Hub pipe and fittings is NOT PERMITTED for underground applications or when embedded in concrete.

END OF SECTION

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LIST OF SUBMITTALS

SUBMITTAL	DATE SUBMITTED	DATE APPROVED
Product Data:		
1. Pipe & fittings	_____	_____

* * *

SECTION 221319 - DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of Drainage Work is indicated on the Drawings and by the requirements of this Section. Coordinate with Section 221000 for piping.

1.2 CODES AND STANDARDS

- A. Comply with applicable portions of the Building Code of the State of New York and with the latest standards.
- B. Where requirements for products, materials, systems, equipment, methods and other portion of the work specified herein exceed minimum requirements of regulatory agencies having jurisdiction over the construction work, contractor shall comply with such requirements specified herein, unless specifically approved otherwise by the Authority.

1.3 SUBMITTALS

- A. Submit shop drawings for the following:

- 1. Roof Drains

- B. The Contractor shall submit shop drawing for and obtain approval of each type of drain with location to be installed before delivery and installation. The shop drawings shall be marked as to type and shall include all dimensions, free area, and features as to meet the specifications.
- C. Certifications: Submit an affidavit stating that the flashing and sealing work at drains and vent stacks is acceptable and in conformance to the New York State Building Code.
- D. Maintenance materials
- E. Manuals: Operation & maintenance manuals for the grease interceptors and the acid neutralizing system. Include in the maintenance manuals of the acid neutralization system, logs detailing chips replacement.

PART 2 - PRODUCTS

2.1 PIPING

- A. Piping, fittings and piping joints shall be as specified in Section 221000.

2.3 ROOF DRAINS

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- A. Type "A": Roof drain shall be Jay R. Smith Fig. 1017-07-CID-C-R-U, Zurn ZC100-C-R-85-VP, Josam 21500-IRMA-3-22-30-X Wade 3000-DFS-5-52-53-42-IC, Watts Drainage Products RD-100-X-85-B-D-K-L or MIFAB R1200-JC-6-B-U-M-X and shall be used with Inverted Roof Membrane Assembly (IRMA roof). Drain shall have cast-iron body with bottom caulk outlet, vandal proof cast-iron or ductile-iron dome, upper and lower flashing clamps, gravel stop or guard, perforated stainless steel extension with holes, sump receiver and underdeck clamp.

The height of the stainless steel extension shall be equal to thickness of the insulation + 1" and extension shall be secured between upper and lower flashing flanges to drain body by means of inside bolts.

- B. Type "B": Roof drain shall be Jay R. Smith Fig. 1011-CID-C-R-U, Zurn ZC100-84-C-R-VP, Josam 21500-19-3-22-30-X, Wade 3000-DP-5-52-53-42-IC or Watts Drainage Products RD-300-X-GSS-B-D-K-L or MIFAB R1200G-U-B-6-M-X for use in conjunction with roof systems where the insulation is installed directly under the crushed stone surfaced waterproof membrane (Built-up roof). Drain shall have cast-iron body with bottom caulk outlet, vandal proof cast-iron dome, underdeck clamp, sump receiver and with 4" high stainless steel perforated gravel stop 1/16" thick with 3/8" diameter openings equally spaced.
- C. Domes for roof drains shall have slots no greater than 1/2" in width and they shall be secured to the drain body by means of locking device.
- D. For type "B" roof drains insulation is to be tapered at drain location. Refer to roof drain Details.

PART 3 - EXECUTION

3.1 SOIL, WASTE AND VENT LINES

- A. All soil, waste and vent pipes passing through roofs shall be flashed so as to prevent leakage and yet allow for the expansion and contraction of the pipes. Refer to Division 7 for installation of such work, except as indicated below.

Built-Up Roofs: For this purpose, tubes of 20-ounces copper 18" long and of such diameter as to permit the free movement of the pipes shall be soldered to a sheet of copper of like weight, 20" square, slipped over the pipes, and secured to the roof in a neat manner. Flashing sleeves shall be slipped over the pipes and extended down over the copper tubes. The sleeves shall be secured in place by caulking between the upper hub of

the sleeves and stacks with lead which shall finish flush with the top of the sleeve.

3.9 ROOF DRAINS

- A. Install roof drains where indicated on the Drawings. Drains shall be set not less than 30" from parapet wall, chimney, bulkhead. If existing roof drain replacement is within 30'' away from edge of roof. Applied liquid flashing shall be used as an alternative to copper flashing.
- B. Roof drain cast iron dome shall extend at least 4" above the surface of the roof immediately adjacent to the roof drain.
- C. Contractor to provide fall protection if roof drain construction work is within 10 feet away from roof edge, which is more than 30'' above floor, lower roof or grade below.

3.10 RAIN LEADERS

- A. Inside leaders shall be located where indicated on the Drawings. Leaders shall be offset as required, to keep the pipes close to walls or columns or in chases. The lower ends of leaders shall be turned by means of long sweep, 90 degree bends; install accessible tapped tee cleanouts with brass screw plug above bends, all properly supported on brick or concrete piers, or wrought iron hangers which must be approved before being used. Leader connections at roof shall be kept in hung or furred ceilings where possible.
- B. It is the intent that the leaders shall be put into service as soon as required. The leaders shall be protected against frost, obstructions and all damage, by the Contractor, who shall replace damaged leaders and remove obstructions until the work is completed and accepted.

3.11 PROTECTION

- A. All open ends of pipes shall be temporarily capped or closed by a proper fitting, to prevent obstruction and damage, until piping is approved and ready for service.

3.12 PIPING SYSTEM TRANSITIONS

- A. When a transition is required from one piping system to another, an approved transition coupling shall be used.
- B. When connecting No-hub to a bell & spigot fitting of cast iron piping system, an approved transition coupling shall be used. When it is necessary to cut a new fitting into an existing bell & spigot cast iron piping system, a section of the hubed

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cast iron piping shall be removed to allow a three-piece fold-in installation of new bell & spigot cast iron piping with lead and oakum joints. The use of No-hub shall not be permitted within a bell & spigot cast iron piping system.

3.13 NO-HUB PIPING -ADDITIONAL REQUIREMENTS

- A. Vertical piping shall be braced at each joint to assure maintaining alignment.
- B. Vertical piping shall be secured at base of stack to building structure with socket clamp and rods or trapeze hangers.

END OF SECTION

LIST OF SUBMITTALS

SUBMITTAL	DATE SUBMITTED	DATE APPROVED
Product Data:		
1. Roof drain	_____	_____
2. vent cap	_____	_____

* * *

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceways and cables.
 - 2. Sleeve seals.
 - 3. Grout.
 - 4. Common electrical installation requirements.

1.2 SUBMITTALS

- A. Product Data: For sleeve seals.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
 - 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

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- a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - e. Approved equal
2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 3. Pressure Plates: Stainless steel. Include two for each sealing element.
 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

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3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

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- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 26 05 00

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Alcan Products Corporation; Alcan Cable Division.
 2. American Insulated Wire Corp.; a Leviton Company.
 3. General Cable Corporation.
 4. Senator Wire & Cable Company.
 5. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70.

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- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

2.2 CONNECTORS AND SPLICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AFC Cable Systems, Inc.
 2. Hubbell Power Systems, Inc.
 3. O-Z/Gedney; EGS Electrical Group LLC.
 4. 3M; Electrical Products Division.
 5. Tyco Electronics Corp.
 6. Approved equal
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SLEEVES FOR CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- C. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

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3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- D. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.
- E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
- F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- G. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- H. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

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- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- I. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.4 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- D. Cut sleeves to length for mounting flush with both wall surfaces.
- E. Extend sleeves installed in floors 2 inches above finished floor level.
- F. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
- G. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
- H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Division 07 Section "Joint Sealants."

- I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Division 07 Section "Penetration Firestopping."
- J. Roof-Penetration Sleeves: Seal penetration of individual cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- L. Underground Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch annular clear space between cable and sleeve for installing mechanical sleeve seals.

3.5 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground exterior-wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

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6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- C. Conductor Terminations and Connections:
 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 2. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

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1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.2 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.3 SUBMITTALS

- A. Product Data: For steel slotted support systems.

1.4 QUALITY ASSURANCE

- A. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

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1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - h. Approved equal.
 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 3. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may

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be incorporated into the Work include, but are not limited to, the following:

- 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
 - 5) Approved Equal.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 - 6) Approved Equal.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.
- 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES
- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

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PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.

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5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base.
 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

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2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Alflec Inc.
 - 3. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 4. Anamet Electrical, Inc.; Anaconda Metal Hose.
 - 5. Electri-Flex Co.
 - 6. Manhattan/CDT/Cole-Flex.

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7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. EMT: ANSI C80.3.

D. FMC: Zinc-coated steel.

E. LFMC: Flexible steel conduit with PVC jacket.

F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
2. Fittings for EMT: Steel or die-cast, compression type.

2.2 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Erickson Electrical Equipment Company.
4. Hoffman.
5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
6. O-Z/Gedney; a unit of General Signal.
7. RACO; a Hubbell Company.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet Division.
10. Spring City Electrical Manufacturing Company.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

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- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.
- F. Hinged-Cover Enclosures: NEMA 250, Type 3R, with continuous-hinge cover with flush latch, unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
- G. Cabinets:
 - 1. NEMA 250, Type 3R, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
 - 1. Exposed Conduit: Rigid steel conduit.
 - 2. Concealed Conduit, Aboveground: EMT.
 - 3. Underground Conduit: Rigid steel conduit.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:

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- a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Garage areas.
- 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: Rigid steel conduit.
 - 7. Raceways for Optical Fiber or Communications Cable: EMT.
 - 8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
- 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
- I. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- J. Raceways for Optical Fiber and Communications Cable: Install as follows:
 - 1. 3/4-Inch Trade Size and Smaller: Install raceways in maximum lengths of 50 feet.
 - 2. 1-Inch Trade Size and Larger: Install raceways in maximum lengths of 75 feet.
 - 3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
- K. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70.
- L. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

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3.3 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Identification for conductors and communication and control cable.
 - 2. Warning labels and signs.
 - 3. Equipment identification labels.

1.2 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.

1.4 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

PART 2 - PRODUCTS

2.1 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Marker Tape: Vinyl or vinyl -cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

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2.2 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.
- C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 10 by 14 inches.
- E. Fasteners for Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.
- F. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 mm)."

2.3 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Auxiliary Electrical Systems Conductor and Cable Identification: Use marker tape to identify field-installed alarm, control,

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signal, sound, intercommunications, voice, and data wiring connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and cable pull points. Identify by system and circuit designation.
2. Use system of designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

B. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply baked-enamel warning signs. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

C. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label, drilled for screw attachment.
 - c. Elevated Components: Increase sizes of labels and legend to those appropriate for viewing from the floor.
2. Equipment to Be Labeled:
 - a. Panelboards, electrical cabinets, and enclosures.
 - b. Electrical switchgear and switchboards.
 - c. Transformers.

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- d. Motor-control centers.
- e. Disconnect switches.
- f. Enclosed circuit breakers.
- g. Motor starters.
- h. Push-button stations.
- i. Power transfer equipment.
- j. Contactors.

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 3. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.

END OF SECTION 26 05 53

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Receptacles, receptacles with integral GFCI, and associated device plates.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).

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2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).
5. Approved equal.

2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).
 - e. Approved equal.

2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; GF20.
 - b. Pass & Seymour; 2084.
 - c. Approved equal.

2.4 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
 1. Plate-Securing Screws: Metal with head color to match plate finish.
 2. Material for Finished Spaces: Steel with white baked enamel, suitable for field painting.
 3. Material for Unfinished Spaces: Galvanized steel.

4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

2.5 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.

1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:

1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

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3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted provided the outlet box is large enough.
- D. Device Installation:
1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

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3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."
 - 1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
 - 1. Test Instruments: Use instruments that comply with UL 1436.
 - 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.

END OF SECTION 26 27 26

SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers (MCCBs).
4. Enclosures.

1.2 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.3 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Field quality-control reports.

D. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

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3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Approved equal.

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Suitable for number, size, and conductor material.
5. Service-Rated Switches: Labeled for use as service equipment.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

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2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Approved Equal.

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Lugs: Suitable for number, size, and conductor material.

2.3 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

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3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Approved equal.

B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

D. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.

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3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.2 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."
 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

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3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

END OF SECTION 26 28 16

262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

SECTION 28 05 00 - COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceways and cables.
2. Sleeve seals.
3. Grout.
4. Common electronic safety and security installation requirements.

1.2 SUBMITTALS

A. Product Data: For sleeve seals.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.

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- c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - e. Approved Equal
- 2. Sealing Elements: NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 - 3. Pressure Plates: Stainless steel. Include two for each sealing element.
 - 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electronic safety and security equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRONIC SAFETY AND SECURITY PENETRATIONS

- A. Electronic safety and security penetrations occur when raceways, pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

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- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [steel] [cast-iron] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electronic safety and security installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 28 05 00

SECTION 28 31 11 – MODIFICATION AND ADDITION TO EXISTING ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. System duct smoke detectors.
 - 2. Smoke hatches.

1.3 DEFINITIONS

- A. LED: Light-emitting diode.
- B. NICET: National Institute for Certification in Engineering Technologies.

1.4 SYSTEM DESCRIPTION

- A. Existing fire alarm system is addressable system, with multiplexed signal addressable Manual, Automatic Smoke/Heat Detection and Sprinkler Alarm System with Central Office Connection. The system is addressable, with all initiating devices individually annunciated on the Fire Alarm Control Panel, the remote annunciator and the printer. The system has supervised wiring with all operations as herein described.

1.5 SUBMITTALS

- A. General Submittal Requirements:
 - 1. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified fire-alarm technician, Level III minimum.
 - c. Licensed or certified by authorities having jurisdiction.
- B. Product Data: For each type of product indicated.
- C. Qualification Data: For qualified Installer.

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1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level II technician.
- C. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
 - 1. Notify Owner no fewer than five days in advance of proposed interruption of fire-alarm service.

1.8 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by manufacturer of existing fire alarm system Edwards System Technology (single source).
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product matching existing devices by Edwards System Technology (single source).

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices :
 - 1. Duct smoke detectors.
- B. Fire-alarm system shall operate as per existing sequence of operation of existing fire alarm system.

2.3 FIRE-ALARM CONTROL UNIT

- A. General Requirements for Fire-Alarm Control Unit:
 - 1. Fire alarm control panel is existing fire alarm panel (model number EST-3 manufactured by Edwards System Technology).

2.4 SYSTEM DUCT SMOKE DETECTORS

- A. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
 - 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 - 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
 - 3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.
 - 4. Each sensor shall have multiple levels of detection sensitivity.
 - 5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 - 6. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.
- B. General Requirements for System Smoke Detectors:
 - 1. Comply with UL 268; operating at 24-V dc, nominal.
 - 2. Integral Addressable Module: Arranged to communicate detector status normal, alarm, or trouble to fire-alarm control unit.
 - 3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
 - 4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 - 5. Integral Visual-Indicating Light: LED type indicating detector has operated.

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C. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

D. All new devices must be compatible with the existing fire alarm control panel and shall be obtained from the existing fire alarm system vendor.

2.5 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

B. Integral Relay: Capable of providing a direct signal to smoke hatch or RTU unit shutdown.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.

1. Connect new equipment to existing control panel in existing part of the building.
2. Connect new equipment to existing monitoring equipment at the supervising station.

C. Expand, modify, and supplement existing control equipment as necessary to extend existing control functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.

D. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

3.2 CONNECTIONS

A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

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3.4 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
 - b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
 - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 5. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

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3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 283111

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