



**CONTRACT 1  
SUFFERN WWTP UPGRADES  
VILLAGE OF SUFFERN  
ROCKLAND COUNTY, NY**

**ENGINEER'S PN: 19-1612  
SRF NUMBER: C3-5377-03-00**

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**CONTRACT SPECIFICATIONS  
AND BID DOCUMENTS**

**Contract 1G  
Contract 1E  
Contract 1H**

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**VILLAGE OF SUFFERN  
61 WASHINGTON AVE  
SUFFERN, NY 10901**

**Prepared by:**



**DELAWARE ENGINEERING, D.P.C.  
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**December 2020**



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SUFFERN WWTP UPGRADES  
VILLAGE OF SUFFERN  
ROCKLAND COUNTY, NY  
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## **Bidding Information**



ADVERTISEMENT TO BID

Sealed Bids will be received until January 21st, 2021 at Village Hall, 61 Washington Ave., Suffern, NY 10901 in a sealed envelope bearing the name and address of the Bidder and "Suffern WWTP Upgrades" until 03:00 PM local time and then at said office publicly and read aloud for:

**VILLAGE OF SUFFERN  
ROCKLAND COUNTY, NEW YORK  
CONTRACT 1  
SUFFERN WWTP UPGRADES  
Contract 1G  
Contract 1E  
Contract 1H**

Work shall include but is not limited to:

**Contract #1G:** This work consists of a new headworks building and upgrades to the existing trickling filters.

**Contract #1E:** This work consists of a electrical and control work for the new headworks building and upgrades to the existing trickling filters.

**Contract #1H:** This work consists of a heating and ventilation for the new headworks building.

A Pre-Bid conference will not be held. Bidders are encouraged to call ahead of time and schedule an on-site walk through at the Village of Suffern WWTP, 1 Ramapo Ave, Suffern, NY 10901. (Behind the baseball field).

Contract Documents may be examined at no expense on line at the following website: [www.debiddocuments.com](http://www.debiddocuments.com), or at the office of Delaware Engineering, D.P.C., 28 Madison Ave Extension Albany NY, 12203.

Digital copies of the Contract Documents may be obtained online as a download for a non-refundable fee of Forty-Nine Dollars (\$49.00) from the website: [www.debiddocuments.com](http://www.debiddocuments.com). Complete hardcopy sets of bidding documents may be obtained from REV, 330 Route 17A, Suite #2, Goshen, NY 10924, Tel: 1-877-272-0216, upon depositing the sum of One Hundred Dollars (\$100.00) for each combined set of documents. Checks or money orders shall be made payable to Delaware Engineering, D.P.C. Cash deposits will not be accepted. Any Bidder requiring documents to be shipped shall make arrangements with REV and pay for all packaging and shipping costs.

Any Bidder who submitted completed Bid Forms to the Village of Suffern, upon returning such set in good condition within thirty days following the award of the contract or rejection of the bids, will be refunded his full payment. Deposits will not be refunded to any non-bidder (including material suppliers, subcontractors, or those that provide quotes to Bidders). Questions should be sent to Robert Flores, PE via email at [rflores@delawareengineering.com](mailto:rflores@delawareengineering.com) or Fax at (518) 452-1335.

Please note that [www.debiddocuments.com](http://www.debiddocuments.com) is the designated location and means for distributing and obtaining all bid package information. All Bidders are urged to register to ensure receipt of all necessary information including bid addenda. All bid addenda will be transmitted to registered plan holders via email and will be available at [www.debiddocuments.com](http://www.debiddocuments.com). Plan holders who have paid for hard copies of the bid documents will need to make the determination if hard copies of the addenda are required for their use, and coordinate directly with REV for hard copies of addenda to be issued. There will be no charge for registered plan holders to obtain hard copies of the bid addenda.

Each bid must be accompanied by security in an amount not less than five percent (5%) of the amount of the bid in the form and subject to the conditions provided in the Information for Bidders. No Bidder may withdraw his bid within forty-five (45) days after the actual date of opening thereof.

The project is funded with state and federal grants and 23% MWBE utilization is required.

The right is reserved to waive any informalities in the Bid and to reject any or all Bids.

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## INSTRUCTIONS TO BIDDERS

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## ARTICLE 1 – DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

## ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.1 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.
- 2.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.3 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.
- 2.4 Bidders who return full sets of the Bidding Documents (paper copies) in good condition and suitable for re-use within 30 days after receipt of Bids will receive a full refund.**

## ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.1 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within ten (10) days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Evidence of Bidder's authority to do business in the state where the Project is located.
- B. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
- C. Other required information regarding qualifications as specifically requested.
- 3.2 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.3 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.4 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

### 4.1 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or

storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

#### 4.2 *Existing Site Conditions*

##### A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:
  - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
  - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

#### 4.3 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

#### **4.4     *Owner's Safety Program***

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

#### **4.5     *Other Work at the Site***

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

### **ARTICLE 5 – BIDDER'S REPRESENTATIONS**

#### **5.1     It is the responsibility of each Bidder before submitting a Bid to:**

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### **ARTICLE 6 – PRE-BID CONFERENCE**

- 6.01 A Pre-Bid conference will not be held. Bidders are encouraged to call ahead of time and schedule an on-site walk through at the Village of Suffern WWTP, 1 Ramapo Ave, Suffern, NY 10901. (Behind the baseball field).

#### **ARTICLE 7 – INTERPRETATIONS AND ADDENDA**

- 7.1 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.2 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

#### **ARTICLE 8 – BID SECURITY**

- 8.1 A Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.2 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the

required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

- 8.3 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.4 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

#### **ARTICLE 9 – CONTRACT TIMES**

- 9.01 The number of days within which the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

#### **ARTICLE 10 – LIQUIDATED DAMAGES**

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

#### **ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS**

- 11.1 The Contract for the Work, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equals” or substitute materials and equipment subsequently approved by the Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids in the case of a proposed substitute and 5 days prior in the case of a proposed “or-equal.” Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner. Substitutes and “or-equal” materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.04 and 7.05 of the General Conditions after the Effective Date of the Contract.
- 11.2 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.
- 11.3 If an award is made, Contractor shall be allowed to submit proposed substitutes and “or-equals”

in accordance with the General Conditions.

## **ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

- 12.01 Contracts will not be awarded to any Bidder who schedules more than 49% of the work to be performed by Subcontractors. Acceptance of Subcontractors for any portion of the work will be based on qualifications and conformance to the Contract documents, and will be determined by the Engineer.
- 12.02 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 12.03 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.06A.

## **ARTICLE 13 – PREPARATION OF BID**

- 13.1 The Bid Form is included with the Bidding Documents.
  - A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
  - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 13.2 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.3 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.4 A Bid by an individual shall show the Bidder’s name and official address.
- 13.5 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.6 All names shall be printed in ink below the signatures.
- 13.7 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.8 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.9 The Bid shall contain evidence of Bidder’s authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder’s state contractor license number, if any, shall also be shown on the Bid Form.

## **ARTICLE 14 – BASIS OF BID**

### **14.1 Base Bid with Alternates**

- A. Bidders shall submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.
- B. In the comparison of Bids, alternates will be applied in any order or combination as listed in the Bid Form.

## **ARTICLE 15 – SUBMITTAL OF BID**

- 15.1 With each copy of the Bidding Documents, a Bidder is furnished one copy of the Bid Form, and, if required, the Bid Bond Form. The Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.
- 15.2 A Bid shall be received no later than the date and time prescribed and at the place indicated in the Bid Advertisement and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed as stated in the Bid Advertisement.
- 15.3 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

## **ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID**

- 16.1 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.2 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.3 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

## **ARTICLE 17 – OPENING OF BIDS**

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

## **ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

18.01 All Bids will remain subject to acceptance for forty-five (45) days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

## **ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT**

- 19.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.2 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.3 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.4 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

## **ARTICLE 20 – BONDS AND INSURANCE**

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

## **ARTICLE 21 – SIGNING OF AGREEMENT**

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.



## **ARTICLE 22 – SALES AND USE TAXES**

22.01 Owner is exempt from New York State Sales and Use Taxes on materials and equipment to be incorporated in the work and will provide a Tax Exemption Certificate to the Contractor on execution of the contract. Said taxes shall not be included in the Contract Price.

## **ARTICLE 23 – WAGE RATES**

23.1 Contractor shall pay its employees an amount equal or greater than New York State Department of Labor wage rates and Federal Bacon Davis wage rates and shall require that any Subcontractor also pay those rates. Certification of payment of wage rates shall be provided monthly.

23.2 This project may be subject to additional conditions imposed by financing agencies and if so these are provided as Exhibits to the Supplementary Conditions.

## **ARTICLE 24 – FEDERAL REQUIREMENTS**

24.01 Federal requirements at Article 19 of the Supplementary Conditions apply to this Contract.

24.02 One additional nationwide waiver to the American Iron and Steel (AIS) requirements has been approved: Pig Iron and Direct Reduced Iron. Information about this can be found at the following website:

<https://www.rd.usda.gov/ais-insufficient-quantities-or-satisfactory-quality-waiver-requests>.

Please note that the stainless-steel nuts and bolts waiver approved at the same time will no longer be allowed as of 2/24/20, after which all such nuts and bolts must meet the AIS requirements or be considered under the de minimis waiver.

## **Addenda**



**Insert Addenda here.**

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## **Bid Forms**

1. BID FORM – CONTRACT 1G
2. BID FORM – CONTRACT 1E
3. BID ITEM TABLE
4. BID BOND FORM
5. CERTIFICATE AS TO CORPORATE PRINCIPAL
6. STATEMENT OF BIDDER’S QUALIFICATIONS
7. CERTIFICATE REGARDING DEBARMENT
8. CERTIFICATION FOR CONTRACTS, GRANTS & LOANS
9. NON-COLLUSION AFFIDAVIT OF BIDDER
10. NON-DISCRIMINATION STATEMENT
11. EEO POLICY STATEMENT
12. STATEMENT ON SEXUAL HARASSMENT
13. EPA FORM 6100-2
14. EPA FORM 6100-3
15. EPA FORM 6100-4
16. AIS CONTRACTOR’S CERTIFICATION



**BID FORM**

VILLAGE OF SUFFERN

ROCKLAND COUNTY, NEW YORK

CONTRACT 1

SUFFERN WWTP UPGRADES

CONTRACT 1G

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## ARTICLE 1 – BID RECIPIENT

1.1 This Bid is submitted to:

***Village of Suffern***

***61 Washington Ave, Suffern, NY 10901***

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

## ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

## ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.1 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related

reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- J. Bidder is aware of the MWBE utilization requirements.
- K. Bidder is aware of the of the American Iron and Steel requirements.

#### **ARTICLE 4 – BIDDER'S CERTIFICATION**

##### **4.1 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices

at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

#### **ARTICLE 5 – BASIS OF BID**

- 5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**Contract 1**  
**Suffern WWTP Upgrades**  
**Contract 1G**

	<b>Total Bid</b>
--	------------------

#### **ARTICLE 6 – TIME OF COMPLETION**

- 6.1 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages.

#### **ARTICLE 7 – ATTACHMENTS TO THIS BID**

- 7.1 The following documents are submitted with and made a condition of this Bid:
  - A. Bid Item Table
  - B. Bid Bond
  - C. Certificate as to Corporate Principal
  - D. Required Bidder Qualification Statement including but not limited to
    - List of Proposed Subcontractors
    - List of Proposed Suppliers
    - List of Project References
    - Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids
  - E. Certificate Regarding Debarment
  - F. Certification for Contracts, Grants, Loans and Cooperative Agreements
  - G. Non-Collusion Affidavit of Bidder
  - H. Non-Discrimination Statement

- I. EEO Policy Statement
- J. Statement on Sexual Harassment
- K. AIS Contractor's Certification

#### **ARTICLE 8 – DEFINED TERMS**

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

## ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

---

By:

*[Signature]*

---

*[Printed name]*

---

*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:

*[Signature]*

---

*[Printed name]*

---

Title:

---

Submittal Date:

---

Address for giving notices:

---

---

---

Telephone Number:

---

Fax Number:

---

Contact Name and e-mail address:

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Federal Tax ID.:

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SUFFERN WWTP UPGRADES Bid Table CONTRACT 1G

BASE BID ITEMS		QUANTITY	UNITS	WRITE OUT THE UNIT PRICE /		FIGURES	ITEM BID PRICE
1	Mobilization						
2	Site and Yard Work						
3	Demolition						
4	Headworks Building						
5	Fans, Louvers, etc						
6	Mechanical Screens and Washer Compactor						
7	Grit Vortex System						
8	Other Headworks Equipment						
9	Trickling Filters						
10	Odor Control						
11	Trickling Filter Pump Station Building						
12	Project Closeout						
13	SCADA						
14	Allowance 1G - Contingency			Seventy Five Thousand Dollars	\$	75,000.00	\$ 75,000.00
15	Allowance 2G - Sludge Disposal			Twenty Five Thousand Dollars	\$	25,000.00	\$ 25,000.00
	BASE BID TOTAL COST (write out both in words and figures)						

**BID FORM**

VILLAGE OF SUFFERN

ROCKLAND COUNTY, NEW YORK

CONTRACT 1

SUFFERN WWTP UPGRADES

CONTRACT 1E

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## ARTICLE 1 – BID RECIPIENT

1.1 This Bid is submitted to:

***Village of Suffern***

***61 Washington Ave, Suffern, NY 10901***

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

## ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

## ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.1 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related



reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
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- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
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- J. Bidder is aware of the MWBE utilization requirements.
- K. Bidder is aware of the of the American Iron and Steel requirements.

#### **ARTICLE 4 – BIDDER'S CERTIFICATION**

##### **4.1 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
  - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices

at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

#### **ARTICLE 5 – BASIS OF BID**

- 5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**Contract 1**  
**Suffern WWTP Upgrades**  
**Contract 1E**

	<b>Total Bid</b>
--	------------------

#### **ARTICLE 6 – TIME OF COMPLETION**

- 6.1 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages.

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    - Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids
  - E. Certificate Regarding Debarment
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  - H. Non-Discrimination Statement

- I. EEO Policy Statement
- J. Statement on Sexual Harassment
- K. AIS Contractor's Certification

#### **ARTICLE 8 – DEFINED TERMS**

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

## ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

---

By:

*[Signature]*

---

*[Printed name]*

---

*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:

*[Signature]*

---

*[Printed name]*

---

Title:

---

Submittal Date:

---

Address for giving notices:

---

---

---

Telephone Number:

---

Fax Number:

---

Contact Name and e-mail address:

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---

Federal Tax ID.:

---

SUFFERN WWTP UPGRADES BID TABLE CONTRACT 1E

BASE BID ITEMS		QUANTITY	UNITS	WRITE OUT THE UNIT PRICE /		FIGURES	ITEM BID PRICE
1	Mobilization						
2	Site and Yard Work						
3	Demolition						
4	Headworks Equipment						
5	Headworks Power and Light						
6	Odor COntrl						
7	Control Conduit and Wire						
8	Project Closeout						
9	Allowance 1E - Contingency			Twenty Five Thousand Dollars	\$	25,000.00	\$ 25,000.00
	BASE BID TOTAL COST (write out both in words and figures)						

**BID FORM**

VILLAGE OF SUFFERN

ROCKLAND COUNTY, NEW YORK

CONTRACT 1

SUFFERN WWTP UPGRADES

CONTRACT 1H

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B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

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- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
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- K. Bidder is aware of the of the American Iron and Steel requirements.

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##### **4.1 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
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  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
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at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

#### **ARTICLE 5 – BASIS OF BID**

- 5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

**Contract 1**  
**Suffern WWTP Upgrades**  
**Contract 1H**

	<b>Total Bid</b>
--	------------------

#### **ARTICLE 6 – TIME OF COMPLETION**

- 6.1 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages.

#### **ARTICLE 7 – ATTACHMENTS TO THIS BID**

- 7.1 The following documents are submitted with and made a condition of this Bid:
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  - D. Required Bidder Qualification Statement including but not limited to
    - List of Proposed Subcontractors
    - List of Proposed Suppliers
    - List of Project References
    - Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids
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- I. EEO Policy Statement
- J. Statement on Sexual Harassment
- K. AIS Contractor's Certification

#### **ARTICLE 8 – DEFINED TERMS**

- 8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

## ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By:

*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_

*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:

*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_

Title: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Address for giving notices:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contact Name and e-mail address: \_\_\_\_\_

\_\_\_\_\_

Federal Tax ID.: \_\_\_\_\_

SUFFERN WWTP UPGRADES Bid TABLE CONTRACT 1H

BASE BID ITEMS		QUANTITY	UNITS	WRITE OUT THE UNIT PRICE /		FIGURES	ITEM BID PRICE
1	Mobilization						
2	Headworks Equipment						
3	Controls and start-up						
4	Project Closeout						
5	Allowance 1H - Contingency			Ten Thousand Dollars	\$	10,000.00	\$ 10,000.00
	BASE BID TOTAL COST (write out both in words and figures)						

---

## BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned \_\_\_\_\_ as PRINCIPAL, and \_\_\_\_\_, as SURETY, are held and firmly bound unto the Village of Suffern, New York, in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful money of the United States for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the Accompanying Bid, dated \_\_\_\_\_, 201\_\_ for \_\_\_\_\_.

NOW THEREFORE, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the same, or, if no period be specified within thirty (30) days after the said opening, and shall within the period specified therefore, or if no period by specified, within fifteen (15) days after the prescribed forms are presented to him for signature, enter into a written Contract with the County, in accordance with the Bid is accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract; or in the event of withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the County, the difference between the amount specified in said Bid and the amount for which the County may procure the required work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_ the name and corporate seal of each corporate party being hereto affixed and these presents signed by its undersigned representative, pursuant to authority of its governing body.

No Extension of time or other modification of this Bid Bond shall be valid unless agreed to in writing by the parties to this Bond. Signed and Sealed this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_.

### FOR BIDDER:

	(Company)	
(Witness)	(Name/Title)	(Seal)
	(Signature)	

### FOR SURETY:

	(Company)	
(Witness)	(Name/Title)	(Seal)
	(Signature)	

---

ACKNOWLEDGEMENT FOR CORPORATION State of \_\_\_\_\_, County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 201\_\_, before me personally came \_\_\_\_\_  
to me known, who being duly sworn, did depose and state that he is the \_\_\_\_\_ of  
\_\_\_\_\_, the Corporation described in and  
which executed the above 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.

My commission expires: \_\_\_\_\_  
Notary Public – Seal

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ACKNOWLEDGEMENT FOR INDIVIDUAL: State of \_\_\_\_\_, County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 201\_\_, before me personally came \_\_\_\_\_  
\_\_\_\_\_, to me known, and known by me to be the individual described in and who  
executed the foregoing instrument, and acknowledged to me that he executed the same.

My commission expires: \_\_\_\_\_  
Notary Public – Seal

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ACKNOWLEDGEMENT FOR FIRM: State of \_\_\_\_\_, County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 201\_\_, before me personally came \_\_\_\_\_  
\_\_\_\_\_, to me known, and known by me to be a member of the firm of  
\_\_\_\_\_, described in and who executed the  
foregoing instrument, and he thereupon acknowledged that he executed the same as and for the act and deed  
of said firm.

My commission expires: \_\_\_\_\_  
Notary Public – Seal

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ACKNOWLEDGEMENT FOR SURETY State of \_\_\_\_\_, County of \_\_\_\_\_

On this \_\_\_\_ day of \_\_\_\_\_, 201\_\_, before me personally came \_\_\_\_\_  
to me known, who being duly sworn, did depose and state that he is an Attorney-In-Fact  
of \_\_\_\_\_ the corporation described in and which executed the  
within instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such  
corporate seal, and that he signed the said instrument and affixed the said seal as Attorney-in-Fact by  
authority of the Board of Directors of said corporation and by authority of this office under the Standing  
Resolutions thereof.

My commission expires: \_\_\_\_\_  
Notary Public - Seal

**Note:** *Attorney-in-Fact, State of \_\_\_\_\_  
Attach Power of Attorney for person signing for Surety Bond.*

---

**CERTIFICATE AS TO CORPORATE PRINCIPAL**

I, \_\_\_\_\_, certify that I am the (1) \_\_\_\_\_  
of the Corporation named as Principal in the within bond; that \_\_\_\_\_  
who signed the said bond on behalf of the Principal was then \_\_\_\_\_ of  
said corporation; that I know his signature thereto is genuine; and that said bond was duly signed and  
attested to for and in behalf of said corporation by authority of this governing body.

\_\_\_\_\_ (Corporate Seal)  
Title

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## STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder and permanent main office address and telephone number.

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2. Names of all officers and principals in the firm.

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3. When organized (Month, Day, Year).

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4. If a corporation, where incorporated (City, State).

---

5. How many years have you been engaged in construction under your present firm or trade name?

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6. Contracts on hand: (Schedule these, showing gross amount of each contract and the appropriate dates of completion).

---

7. General character of work performed by your company (e.g. Construction, Excavation, etc.).

---

8. Have you ever failed to complete any work awarded to you? If so, where and why?

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9. Have you ever defaulted on a contract? If so, where and why?

---

10. List the important contracts completed by you within the past two years, stating approximate gross cost for each, and the month and year completed.

---

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11. List your major equipment available for this (Description, Age, Contract, etc.).

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12. List experience in construction work similar in importance to this project (Contracts within the past five years).

---

13. List background and experience of the principal members of your organization including the officers (Type of work, number of years).

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14. Give bank reference and names in which accounts are held.

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15. List on a separate sheet of paper proposed suppliers and subcontractors.

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16. Will you, upon request, furnish any other information, financial or otherwise, that may be required by the OWNER?  
Yes\_\_\_\_\_ No\_\_\_\_\_

17. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the OWNER verification of the recitals comprising this Statement of Bidder's Qualifications.

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18. List any pending and or past litigations.

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Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
(Name of Bidder)

By: \_\_\_\_\_  
(Principal)

Title: \_\_\_\_\_

## U.S. DEPARTMENT OF AGRICULTURE

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### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions**

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This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, **Federal Register** (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

#### **(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)**

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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Organization Name

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PR/Award Number or Project Name

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Name(s) and Title(s) of Authorized Representative(s)

---

Signature(s)

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Date

## Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**CERTIFICATION  
FOR  
CONTRACTS, GRANTS, LOANS, AND  
COOPERATIVE AGREEMENTS  
40 CFR 34**

**SRF Project No.:** \_\_\_\_\_

The undersigned each certify, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grant, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

By: \_\_\_\_\_

Name:

Title:

Date: \_\_\_\_\_

Contract ID: \_\_\_\_\_



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**NON-COLLUSION AFFIDAVIT OF BIDDER**

State of \_\_\_\_\_

County of \_\_\_\_\_

\_\_\_\_\_, being first duly sworn, deposes and says that:

1. He is (owner, partner, officer, representative, or agent) of \_\_\_\_\_, the Bidder that has submitted the attached Bid;
2. He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
3. Such Bid is genuine and is not a collusive or sham Bid;
4. 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 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 which 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 other 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 clauses 4-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 therefore. Where 4-a, b, and c above have not been complied with, the Bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the state, public department or agency to which the Bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

The fact that a Bidder (i) has published price lists, rates, or tariffs covering items being procured, (ii) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (iii) 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 clause 4-b.

Any Bid hereafter made to the Municipality or any public department, agency or official thereof by a corporate Bidder for work or services performed or to be performed or goods sold or to be sold, where competitive bidding is required by statute, rule or regulation, and where such Bid contains the certification referred to in subparagraph 4-b, of this section, shall be deemed to have been authorized by the Board of Directors of the Bidder and such authorization shall be deemed to include the signing and submission of the Bid and the inclusion therein of the certificate as to non-collusion as the act and deed of the corporation.

5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

Signed: \_\_\_\_\_, Title: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_, Notary Public, My Commission expires \_\_\_\_\_

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## NON-DISCRIMINATION STATEMENT

In accordance with 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 because of race, creed, color, sex, national origin, age, disability or marital status.

To the extent that such services are to be provided pursuant to the contract, the following paragraph is required:

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: b) discriminate against or intimidate any employee hired for the performance of work under this contract.

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

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**AGREEMENT TO ABIDE BY EQUAL EMPLOYMENT OPPORTUNITY  
POLICY STATEMENT REQUIREMENTS  
NEW YORK STATE REVOLVING FUND (SRF)**

I, \_\_\_\_\_, am the authorized representative of \_\_\_\_\_.

Name of Representative

Name of Contractor/Service Provider

I hereby certify that \_\_\_\_\_ will abide by the equal employment

Name of Contractor/Service Provider

opportunity (EEO) policy statement provisions outlined below.

- (i) A statement that the contractor will not discriminate on the basis of race, creed, color, national origin, sex, age, disability, or marital status against any employee or applicant for employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination and will make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on contracts relating to the Project.
- (ii) An agreement that all of contractor's solicitations or advertisements for employees will state that, in the performance of the contract relating to this Project, all qualified applicants will be afforded equal employment opportunities without discrimination on the basis of race, creed, color, national origin, sex, age, disability or marital status.
- (iii) An agreement to 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.
- (iv) An agreement to comply with the provisions of the Human Rights Law (Article 15 of the Executive Law), including those relating to non-discrimination on the basis of prior criminal conviction and prior arrest, and with all other State and federal statutory constitutional non-discrimination provisions.

Blank EEO Policy Statements are available at [www.efc.ny.gov/mwbe](http://www.efc.ny.gov/mwbe), if needed.

If contractor fails to submit to Recipient an EEO policy statement consistent with the provisions set forth above in clauses (i), (ii), (iii) and (iv) and within the timeframe required thereof, Recipient may declare this contract to be null and void.

**X**

Contractor/Service Provider Representative

Once completed, please provide to the Prime Contractor and/or the community MBO



**STATEMENT ON SEXUAL HARASSMENT**

New York State Finance Law § 139-l

STATE OF \_\_\_\_\_ )  
 ) SS.:  
COUNTY OF \_\_\_\_\_ )

\_\_\_\_\_, being first duly sworn, deposes and says that:

“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 the Bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of section two hundred one-g of the labor law.”

A Bid shall not be considered for award nor shall any award be made to a Bidder who has not complied with the above certification; provided, however, that if the Bidder cannot make the foregoing certification, such Bidder shall so state and shall furnish with the Bid a signed statement which sets forth in detail the reasons therefor.

Any Bid hereafter made to the Municipality or any public department, agency or official thereof by a corporate Bidder for work or services performed or to be performed or goods sold or to be sold, where such Bid contains the above certification, shall be deemed to have been authorized by the Board of Directors of the Bidder and such authorization shall be deemed to include the signing and submission of the Bid and the inclusion therein of such statement as the act and deed of the corporation.

Signed: \_\_\_\_\_, Title: \_\_\_\_\_

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

[affix stamp]



To be completed by prime contractors for all construction contracts

AMERICAN IRON AND STEEL (AIS) CONTRACTOR CERTIFICATION  
FOR  
CONSTRUCTION CONTRACTS PAID FOR WITH FUNDS FROM  
THE NYS CLEAN WATER STATE REVOLVING FUND OR  
THE NYS DRINKING WATER STATE REVOLVING FUND VIA THE  
NYS ENVIRONMENTAL FACILITIES CORPORATION

Project Title: \_\_\_\_\_

Contractor Name: \_\_\_\_\_

Contract ID: \_\_\_\_\_

SRF Project #: \_\_\_\_\_

SRF Recipient Name: \_\_\_\_\_

I certify that the iron and steel products that will be permanently incorporated into the public water system or wastewater treatment works project under this construction contract will have been produced in the United States, in accordance with the requirements of the US Environmental Protection Agency. I will also develop and maintain at the project location the necessary documentation to demonstrate that the iron and steel products incorporated into the project were produced in the United States, and make such documentation available to The NYS Environmental Facilities Corporation or their authorized representatives, upon request.

Signature: \_\_\_\_\_

Name (print): \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_





## **Contract Forms**



## NOTICE OF AWARD

Date of Issuance:

Owner:

Owner's Project No.:

Engineer:

Engineer's Project No.:

Project:

Contract Name:

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated **[date]** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

**[Describe Work, alternates, or sections of Work awarded]**

The Contract Price of the awarded Contract is **\$(Contract Price)**. Contract Price is subject to adjustment based on the provisions of the Contract.

**[Number of copies sent]** unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **[number of copies sent]** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): **[Describe other conditions that require Successful Bidder's compliance]**

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **[Full formal name of Owner]**

By *(signature)*: \_\_\_\_\_

Name *(printed)*: \_\_\_\_\_

Title: \_\_\_\_\_

Copy: Engineer

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**STANDARD FORM OF AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
ON THE BASIS OF A STIPULATED PRICE**

**Article 1. PARTIES TO CONTRACT.**

**THIS AGREEMENT** is dated as of the \_\_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_\_\_\_ by and between the Village of Suffern, NY (hereinafter called OWNER) and \_\_\_\_\_  
(hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

**Article 2. WORK.**

- 2.1 CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

**Contract 1  
Suffern WWTP Upgrades**

**Article 3. CONTRACT TIMES.**

- 3.1 The Work will be substantially complete and operational within **200** calendar days after the date the Contract Time commences to run and completed and ready for final payment within **30** days after Substantial Completion.
- 3.2 *Liquidated Damages.* OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 11.05 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER One Thousand and 00/100 dollars (\$ 1,000.00) for each day that expires after the time specified in paragraph 3.1 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the time specified in paragraph 3.1 for completion and readiness for final payment or any proper extension thereof granted by OWNER. CONTRACTOR shall pay OWNER One Thousand and 00/100 dollars (\$1,000.00) for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.
- 3.3 In addition to the liquidated damages set forth above, the CONTRACTOR shall be liable for all additional costs incurred by the OWNER for engineering and inspection services that extends beyond the substantial completion time specified in the Contract Documents.

#### **Article 4. CONTRACT PRICE.**

The total estimated amount of the Contract is \_\_\_\_\_  
(\$\_\_\_\_\_) based on the prices set forth in the Bid Form.

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to paragraphs 4.1 and 4.2 below:

- 4.1. For the total of the lump sum of base bid, contingency allowance(s), and bid alternate(s).
- 4.2. As provided in the General Conditions estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by ENGINEER as provided in the General Conditions.

#### **Article 5. PAYMENT PROCEDURES.**

CONTRACTOR shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

- 5.1. *Progress Payment & Retainage.* OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, on or about the last day of each month during construction as provided in paragraphs 5.1.1 and 5.1.2 below. All such payments will be measured by the schedule of values established in paragraph 2.03 of the General Conditions (and in the case of Unit Price Work based on the number of units completed or, in the event there is no schedule of values, as provided in the General Requirements.
  - 5.1.1 Prior to substantial completion, the CONTRACTOR shall be paid up to 95% of the amount for the work completed in accordance with Section 10 of Special Conditions, with the 5% balance being retainage.
  - 5.1.2. Upon Substantial Completion, the OWNER may increase total payments to CONTRACTOR to 100% of Contract Price, less an amount equal to double the value of the remaining work or the retainage whichever is less, provided the OWNER receives a release of surety from the CONTRACTOR.
- 5.2. *Final Payment.* Upon final completion and acceptance of the Work in accordance with paragraph 15.06 of the General Conditions. OWNER shall pay the remainder of the Contract Price.
- 5.3. *Change Orders.* For changes in work greater than \$100,000, the percentage of overhead and profit shall be subject to negotiation.

#### **Article 6. CONTRACTOR'S REPRESENTATIONS.**

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- 6.1 CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda) and the other related data identified in the Bidding Documents including "technical data."
- 6.2 CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.
- 6.3 CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- 6.4 CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigation, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.
- 6.5 CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the site that relates to the Work as indicated in the Contract Documents.
- 6.6 CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 6.7 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

#### **Article 7. CONTRACT DOCUMENTS.**

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 7.1. This Agreement
- 7.2. Exhibits to this Agreement
- 7.3. Performance, Payment, and other Bonds, identified as exhibits.
- 7.4. Notice to Proceed
- 7.5. General Conditions

- 7.6. Supplementary Conditions
- 7.7. Special Conditions
- 7.8. Specifications bearing the title Technical Specifications
- 7.9. Drawings with each sheet bearing the following general title: Suffern WWTP Upgrades
- 7.10. Addenda.
- 7.11. CONTRACTOR's Bid
- 7.12. Documentation submitted by CONTRACTOR prior to Notice of Award
- 7.13. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to paragraph 3.04 of the General Conditions.

The documents listed in paragraphs 7.2 et seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in Article 7. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.04 of the General Conditions.

#### **Article 8. MISCELLANEOUS.**

- 8.1. Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 8.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment. No assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 8.3. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.
- 8.4. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.



## Article 9. Affirmative Action Provisions

9.1. Refer to the EFC Bid Packet for Construction Contracts for the affirmative action goals and requirements.

## Article 10. Contractor's Agreement Certification

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR or identified by ENGINEER on their behalf.

This Agreement will be effective on \_\_\_\_\_, 20 \_\_\_\_\_ (which is the Effective Date of the Agreement).

OWNER\_\_\_\_\_ CONTRACTOR\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ By: \_\_\_\_\_

[CORPORATE SEAL]

[CORPORATE SEAL]

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# PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

## CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

## BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

## CONTRACTOR AS PRINCIPAL

## SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

(Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal

(Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### 11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

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## PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

### CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

### BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
  - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.



9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### 15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

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Insert Insurance Certificate here



---

**NOTICE TO PROCEED**

---

Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Delaware Engineering, D.P.C.	Engineer's Project No.:
Project:	
	Effective Date of Contract:

---

**TO CONTRACTOR:**

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[Month, Day, Year]**.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the number of days to achieve Substantial Completion is \_\_\_\_\_, and the number of days to achieve readiness for final payment is \_\_\_\_\_.

Before starting any Work at the Site, Contractor must notify **Dig Safe New York** for an emergency callout to the site.

Note MWBE Utilization Plan must be approved prior to payment processing.

Owner:

By:  
Title:  
Date Issued:

Copy: Robert Flores, PE - Delaware Engineering, DPC

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**Contract 1**  
**Suffern WWTP Upgrades**  
**Village of Suffern**  
**Rockland County, NY**  
**CHANGE ORDER NO. #**

Owner \_\_\_\_\_ Date \_\_\_\_\_

Project \_\_\_\_\_

Owner's Contract No. \_\_\_\_\_ Contractor: \_\_\_\_\_

Date of Contract Start \_\_\_\_\_

**You are directed to make the following changes in the Contract Documents:**

\_\_\_\_\_

**Reason for Change Order:**

\_\_\_\_\_

CONTRACT PRICE		CONTRACT TIMES (Calendar Days)	
		To substantial completion	To final completion
Original:	\$ _____	ORIGINAL:	_____
Previous C.O.s (ADD):	\$ _____	Previous C.O.s (ADD/DEDUCT):	_____
This C.O. (ADD / NTE):	\$ _____	This C.O. (ADD/DEDUCT):	_____
Contract Price with all		REVISED:	_____
Approved Change Orders:	\$ _____	Notice to proceed:	_____
		Original Completion Date:	_____

**Change Order Details:**

\_\_\_\_\_

THIS DOCUMENT SHALL BECOME AN AMENDMENT TO THE CONTRACT AND ALL  
STIPULATIONS AND COVENANTS OF THE CONTRACT SHALL APPLY HERETO.

RECOMMENDED:

By: \_\_\_\_\_  
Engineer (Authorized Signature) \_\_\_\_\_ Date \_\_\_\_\_

APPROVED:

By: \_\_\_\_\_  
Owner (Authorized Signature) \_\_\_\_\_ Date \_\_\_\_\_

ACCEPTED:

By: \_\_\_\_\_  
Contractor (Authorized Signature) \_\_\_\_\_ Date \_\_\_\_\_

**Contract 1**  
**Suffern WWTP Upgrades**  
**Village of Suffern**  
**Rockland County, NY**  
**CHANGE ORDER NO. #**

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## CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:  
Contractor:  
Engineer: Delaware Engineering, D.P.C.  
Project:

Owner's Project No.:  
Contractor's Project No.:  
Engineer's Project No.:  
Contract Name:

**This final Certificate of Substantial Completion applies to:**

☐ All Work ☐ The following specified portions of the Work:

### Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's  
responsibilities: ☐ None  
☐ As follows

Amendments to  
Contractor's responsibilities: ☐ None  
☐ As follows:

The following documents are attached to and made a part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

This page is intentionally left blank.

## WARRANTY BOND

<b>Contractor</b> Name: <b>[Full formal name of Contractor]</b> Address <i>(principal place of business)</i> : <b>[Address of Contractor's principal place of business]</b>	<b>Surety</b> Name: <b>[Full formal name of Surety]</b> Address <i>(principal place of business)</i> : <b>[Insert address of Surety's principal place of business]</b>
<b>Owner</b> Name: <b>[Full formal name of Owner]</b> Address <i>(principal place of business)</i> : <b>[Address of Owner's principal place of business]</b>	<b>Construction Contract</b> Description <i>(name and location)</i> : <b>[Owner's project/contract name, and location of the project]</b>  Contract Price: <b>[Amount from Contract]</b> Effective Date of Contract: <b>[Date from Contract]</b>  Contract's Date of Substantial Completion: <b>[Date from Contract]</b>
<b>Bond</b> Bond Amount: <b>[Amount]</b> Date of Bond: <b>[Date]</b>  Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 9	
Bond Period: Commencing 364 days after Substantial Completion of the Work under the Construction Contract, and continuing until <b>[insert number of years, typically either two or three]</b> years after such Substantial Completion.	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Warranty Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i> By: _____ <div style="text-align: right;"><i>(Signature)</i></div>	<i>(Full formal name of Surety) (corporate seal)</i> By: _____ <div style="text-align: right;"><i>(Signature) (Attach Power of Attorney)</i></div>
Name: _____ <div style="text-align: right;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: right;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
Attest: _____ <div style="text-align: right;"><i>(Signature)</i></div>	Attest: _____ <div style="text-align: right;"><i>(Signature)</i></div>
Name: _____ <div style="text-align: right;"><i>(Printed or typed)</i></div>	Name: _____ <div style="text-align: right;"><i>(Printed or typed)</i></div>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract's Correction Period Obligations. The Construction Contract is incorporated herein by reference.
2. If the Contractor performs the Correction Period Obligations, the Surety and the Contractor shall have no obligation under this Warranty Bond.
3. If Owner gives written notice to Contractor and Surety during the Bond Period of Contractor's obligation under the Correction Period Obligations, and Contractor does not fulfill such obligation, then Surety shall be responsible for fulfillment of such Correction Period Obligations. Surety shall either fulfill the Correction Period Obligations itself, through its agents or contractors, or, in the alternative, Surety may waive the right to fulfill the Correction Period Obligations itself, and reimburse the Owner for all resulting costs incurred by Owner in performing Contractor's Correction Period Obligations, including but not limited to correction, removal, replacement, and repair costs.
4. The Surety's liability is limited to the amount of this Warranty Bond. Renewal or continuation of the Warranty Bond will not modify such amount, unless expressly agreed to by Surety in writing.
5. The Surety shall have no liability under this Warranty Bond for obligations of the Contractor that are unrelated to the Construction Contract. No right of action will accrue on this Warranty Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
6. Any proceeding, legal or equitable, under this Warranty Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and must be instituted within two years after the Surety refuses or fails to perform its obligations under this Warranty Bond.
7. Written notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown in this Warranty Bond.
8. Definitions
  - 8.1. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page of this Warranty Bond, including all Contract Documents and changes made to the agreement and the Contract Documents.
  - 8.2. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
  - 8.3. *Correction Period Obligations*—The duties, responsibilities, commitments, and obligations of the Contractor with respect to correction or replacement of defective Work, as set forth in the Construction Contract's Correction Period clause, EJCDC® C-700, Standard General Conditions of the Construction Contract (2018), Paragraph 15.08, as duly modified.
  - 8.4. *Substantial Completion*—As defined in the Construction Contract.
  - 8.5. *Work*—As defined in the Construction Contract.
9. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

## **Contract Conditions**



# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.



37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.



- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### **5.02 *Use of Site and Other Areas***

#### **A. *Limitation on Use of Site and Other Areas:***

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is



maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

#### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

#### 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

#### 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01   *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02   *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### **7.03   *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.



- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.



8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01    *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02    *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03    *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04    *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05    *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06    *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07    *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an



adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### ARTICLE 12 – CLAIMS

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 Cost of the Work**

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.



## **ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **14.01 Access to Work**

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### **14.02 Tests, Inspections, and Approvals**

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
  - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
  - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of



inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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## SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the General Conditions and other provisions of the Contract Documents as indicated below. Any provisions, which are not so amended or supplemented, remain in full force and effect.

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#### **Article 1        Definitions and Terminology**

The terms used in these Supplementary Conditions which are defined in the General Conditions have the same meanings assigned to them in the General Conditions.

#### **Article 3        Documents: Intent, Requirements, Reuse**

Add the following paragraph:

- 3.02.A.1.a. The contract work shall be installed conformance with the following applicable standards as applied:
1. "Recommended Standards for Water Works", (Ten State Standards), most recent edition
  2. "Recommended Standards for Wastewater Facilities", (Ten State Standards), most recent edition
  3. "Standard Specifications, Construction and Materials," New York State Department of Transportation, most recent edition
  4. "New York State Standards and Specifications for Erosion and Sediment Control", NYSDEC, most recent edition

#### **Article 5        Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions**

Add the following paragraph:

- 5.02.E.        Easements
1. If necessary, the OWNER shall obtain permanent easements for the project prior to any work that will be done on the properties. The OWNER shall provide the easements to the CONTRACTOR.
  2. CONTRACTOR shall secure at own expense any necessary temporary easements needed for staging and or any other activity required to complete the Work.

Add the following paragraph:

- 5.07            In the preparation of the Drawings and Specifications, ENGINEER may have relied upon the following:

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1. “As-built” information provided by the Owner.
  2. Record information provided by the Owner.
  3. Exhibits included in Project Manual.
  4. Data from laboratory tests.
  5. General survey notes as listed in the Drawings.

## **Article 6       Bonds and Insurance**

Add the following paragraph:

6.01.G. CONTRACTOR shall execute bonds as required by Article 6 of the General Conditions and specified below:

- a. Performance and Payment Bond equal to 100 percent of the contract price. Such Bond to be provided prior to execution of the Contract
- b. Warranty Bond equal to 25 percent of the contract price, such Bond to be provided upon final completion and on commencement of the Warranty period. And to remain in effect for one year
- c. Bonds obtained shall be in a form, and from a Surety, acceptable to the Funding Agency or Municipality.
- d. In the event the Contract Price is adjusted by Change Order by more than ten percent of the Contract price, the OWNER may request that the Bond values be increased accordingly.

Add the following to existing paragraph 6.03.C.:

6.03.C. Commercial General Liability Insurance, written on an occurrence form, on a primary and non-contributory basis, by insurance companies authorized to write insurance in New York, insuring against bodily injury and property damage in the following amounts:

- a. Each Occurrence \$2,000,000
- b. General Aggregate \$2,000,000\*
- c. Personal and Advertising Injury \$1,000,000
- d. Products-Completed Operations Aggregate \$1,000,000
- e. Fire Damage – any one fire \$50,000
- f. Medical Expense – any one person \$5,000
- g. Property Damage insurance to include coverage for explosion, collapse and underground hazards.

\* The general aggregate limit applies per project.

Add the following to existing paragraph 6.03.D.:

6.05.D. Automobile Liability insurance covering bodily injury and property damage for owned, non-owned and hired motor vehicles with a combined single limit of liability in the amount of \$1,000,000.

Add the following to existing paragraph 6.03.E.:

6.03.E. Umbrella liability insurance policy covering bodily injury and property damage in the amount of \$1,000,000.



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Add the following paragraph:

6.03.K. Statutory Requirements. The contractor shall secure and keep in force all insurances in such amounts as are required by New York State Law and the laws of the United States, including: Worker's Compensation Insurance, NYS Disability Insurance, Unemployment Insurance.

Add the following paragraph:

6.03.L. Named Insureds. The Owner, its officers, employees, and engineers shall be named as additional insured on a primary basis for insurances required.

Add the following paragraph:

6.03.M. CONTRACTOR shall purchase and maintain an OWNER's and CONTRACTOR's Protective Liability policy in the name of the OWNER for the project, so as to provide dedicated coverage for the Project and the OWNER. Policy shall be in the amount of:

\$1,000,000 per occurrence

\$2,000,000 aggregate.

#### **INCLUDE 6.03.N. WHEN PROJECT INCLUDES ANY BUILDING STRUCTURE**

Add the following paragraph:

6.03.N. To protect interests of the OWNER and CONTRACTOR, the CONTRACTOR shall purchase and maintain through the Contract period a **full** Builders Risk Policy equal to \_\_\_\_\_. Such policy shall allow for occupancy and use by the OWNER of the work until such time as the project is final complete and accepted by the OWNER. As part of, or in addition to Builders Risk Policy, CONTRACTOR shall purchase and maintain a policy providing Boiler and Machinery Coverage, including Testing and Turning.

Add the following paragraph:

6.03.O. Above insurance requirements shall be binding on Subcontractors as well as the General CONTRACTOR. OWNER may request proof of insurance for any Subcontractor working on the site.

Add the following paragraph:

6.03.P. Insurance requirements apply separately to each Contract let under the overall project.

## **Article 7 Contractor's Responsibilities**

### **7.10. Laws and Regulations:**

#### **1. Add the following to paragraph 7.10 (A) of the General Conditions:**

The Industrial code of the State of New York, Rule 53, Part 53 of Title 12 of the Compilation of Codes, Rules and Regulations (12 NYCRR 53) - Construction, Excavation and Demolition Operations at or near underground facilities - Effective April 1, 1975.

This Rule, Part 53 of Title 12 of the Compilation of Codes related to Construction, Excavation and Demolition Operations at or near underground facilities in order to assure safety and prevent damage to public or private property.

### **7.18 Indemnification**

#### **1. Add the following provisions to paragraph 7.18 of the General Conditions:**

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Indemnification shall include, to the extent allowed by law, workplace safety and third-party over suits. Subcontractors shall also be subject to indemnification requirements.

## **ARTICLE 10    ENGINEER'S STATUS DURING CONSTRUCTION**

### **A. Project Representation:**

Add two new Paragraphs immediately after Paragraph 10.03 of the General Conditions, which are to read as follows:

1. The terms Resident Project Representative and RESIDENT ENGINEER shall be used interchangeably.
2. The RESIDENT ENGINEER shall maintain a force for inspection of construction, which shall consist of a field staff and supporting personnel required in connection therewith. Nothing in the OWNER/ENGINEER agreement or in the Contract Documents shall be construed to make the RESIDENT ENGINEER a guarantor of the performance of the CONTRACTOR or others, nor shall any provision in this agreement be construed as giving the RESIDENT ENGINEER, on its own behalf or on behalf of the OWNER, the responsibility for or the authority to direct or supervise construction methods, techniques, procedures or safety measures. The RESIDENT ENGINEER will not be responsible for the enforcement of the obligations of the CONTRACTOR or others, nor their failure to execute the Work in accordance with the Contract Documents and within the time period specified.

The services furnished hereunder can be generally described as follows:

- a. Schedules: The RESIDENT ENGINEER shall review the CONTRACTOR'S progress schedules, schedule of Shop Drawings, and other schedules prepared by the CONTRACTOR and review and report to the OWNER as to their acceptability.
- b. Conferences: The RESIDENT ENGINEER shall arrange, schedule and conduct pre-construction conferences, progress meetings and other job conferences as may be required, and notify in advance those who are expected to attend.
- c. Liaison: The RESIDENT ENGINEER shall serve as the OWNER'S on-site liaison with the CONTRACTOR concerning the CONTRACTOR'S performance under the terms of its Contract.
- d. Shop Drawings and Samples: The RESIDENT ENGINEER shall receive and record the date of receipt, and monitor transmission of Shop Drawings, Samples, and test data submitted by the CONTRACTOR, and shall receive and record the date of receipt thereof, and monitor the transmission of the above-referenced submissions which have been reviewed.
- e. Inspection of Materials and Equipment: The RESIDENT ENGINEER shall inspect and approve or reject construction materials and equipment to determine their general compliance with the Contract Documents.

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1. In the event the OWNER engages an independent testing laboratory to conduct tests on materials and equipment, then the RESIDENT ENGINEER shall cooperate with said independent testing laboratory to determine general compliance with the Contract Documents.
  2. The RESIDENT ENGINEER shall report to the DESIGN ENGINEER whenever he believes that Work is unsatisfactory, faulty, defective, has been damaged, does not conform to the Contract Documents, or does not meet the requirements of inspections, tests or approvals required to be made, and shall advise the DESIGN ENGINEER when he believes Work should be corrected, rejected, uncovered for observation, or requires special tests or inspection.
  3. The RESIDENT ENGINEER shall verify that tests, equipment and systems start-up and operating and maintenance instructions are followed and conducted by the CONTRACTOR in the presence of the appropriate personnel, as required by the Contract Documents, and that the CONTRACTOR maintains adequate records thereof.
- f. Change Orders and Supplemental Agreements: The RESIDENT ENGINEER shall prepare all Change Orders and supplemental agreements in the form and manner approved by the OWNER, for authorized alterations to the Work as provided for under the Contract Documents.
- g. Records: The RESIDENT ENGINEER shall maintain at the job site orderly files for correspondence, reports or job conferences, Shop Drawing and Sample submissions, reproductions of original Contract Documents including Addenda, authorized alterations to the Contract Documents, Change Orders, Field Orders, additional drawings issued subsequent to the execution of the Contract, clarification letters, and other alterations to the Contract Documents, interpretations of the Contract Documents, progress reports, and other Project related documents.
- h. CONTRACTOR'S Claims: The RESIDENT ENGINEER shall investigate and furnish to the OWNER information relating to the CONTRACTOR'S claims and make recommendations with regard to payment of such claims.
- i. Reports: The RESIDENT ENGINEER shall furnish the OWNER with monthly reports as required, of the progress of the Work and of the CONTRACTOR'S compliance with the approved progress schedule, schedule of Shop Drawings submissions and other schedules.
1. The RESIDENT ENGINEER shall notify the OWNER of permanent Work which does not conform to the results required in the Contract Documents, prepare written reports describing any apparent, nonconforming Work and make recommendations to the OWNER for its correction and, at the request of the OWNER notify the CONTRACTOR of RESIDENT ENGINEER'S directions for correction of nonconforming Work.
  2. The RESIDENT ENGINEER shall prepare completion lists when substantial Completion of the Project is claimed by the CONTRACTOR. The RESIDENT ENGINEER shall measure pay items of Work.
- j. CONTRACTOR'S Requests for Payment: The RESIDENT ENGINEER shall review the CONTRACTOR'S Application for Payment and shall certify that the Work has progressed to the point indicated by the CONTRACTOR, that to the best of his knowledge, information and belief, based on its inspection and review, the Work is in accordance with the Contract Documents, and that the CONTRACTOR is entitled to the payment of the amount certified.

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1. The RESIDENT ENGINEER'S certification shall be subject to an evaluation of the Work as a functioning project upon Substantial Completion, and to the results of any subsequent tests required by or performed under the Contract Documents, and to minor deviations from the Contract Documents, correctable prior to completion, and to any additional specific qualifications stated in the certificate.
  2. By approving an Application for Payment, the RESIDENT ENGINEER will not be deemed to have represented that he has made any determination as to how or for what purpose any CONTRACTOR has used the monies paid on account of the Contract Price, or that title to any of the CONTRACTOR'S Work, materials, or equipment has passed to the OWNER free and clear of any liens, claims, security, interest or encumbrances.
- k. Drawings: The RESIDENT ENGINEER shall, based on documentation provided by the CONTRACTOR, and collected and reviewed by said RESIDENT ENGINEER, prepare record drawings
- l. Guarantees, Certificates, and Inspections Prior to Guarantee Period: During the course of the Work, the RESIDENT ENGINEER shall verify that guarantees, certificates, maintenance and operation manuals, and other data required to be assembled and furnished by the CONTRACTOR, are applicable to the items actually installed, and shall deliver these items and information to the OWNER prior to the final acceptance of the Project.
1. The RESIDENT ENGINEER and OWNER shall make an inspection approximately ninety days prior to the expiration of the guarantee period of the Contracts. The RESIDENT ENGINEER shall submit a written report to the OWNER listing discrepancies between guarantees and performance.
  2. The RESIDENT ENGINEER shall assist in efforts to effect and expedite the correction or adjustment of CONTRACTOR'S defective Work, if any. The RESIDENT ENGINEER shall conduct final inspection to verify that the defective Work has been corrected or adjusted, and shall make recommendations to the OWNER concerning its acceptance.
  3. The RESIDENT ENGINEER shall arrange for instruction by the CONTRACTOR and the manufacturer's representatives to the OWNER or its designated representatives concerning the proper operation and maintenance of the equipment furnished and installed for the Project.

## **Article 17      Final Resolution of Disputes**

- A. Disputes shall be resolved in accordance with the General Conditions.
- B. Compliance with Laws:
1. The CONTRACTOR shall abide by all local and State Laws or ordinances to the extent that such requirements do not conflict with Federal laws or regulations.
  2. It is further understood and agreed between the parties that each and every other provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and that this Contract shall be read and enforced as though the same were included herein.

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C. Safety and Health Regulations:

1. The CONTRACTOR shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).
2. The attention of the CONTRACTOR is directed to the provisions of Section 4(b)(4) of the Occupational Safety and Health Act of 1970, as follows:

"Nothing in this Act shall be construed to supersede or in any manner affect any workman's compensation law or to enlarge or diminish or affect in any manner the common law or statutory rights, duties, or liabilities of employers and employees under any law with respect to injuries, disease, or death of employees arising out of, or in the course of, employments."

3. The CONTRACTOR shall at all times, comply with the latest applicable State Laws pertaining to the Safety of Workers in the Construction Field.

## **ARTICLE 12.0 COVID-19 PANDEMIC RELATED CONDITIONS**

In light of the COVID-19 Pandemic, you must sign below indicating your Agreement and Acceptance of the following:

A. The Owner and Bidder/Contractor acknowledge that in New York State there is currently an Executive Order in place which allows construction for essential municipal projects to proceed because said construction, and the continued operation of municipalities, are considered "Essential Services" under Executive Order 202.3 and all extensions of said Order;

B. Pursuant to said Executive Orders, all people on the construction site must maintain a distance of six (6) feet between each other, or wear a face covering, except to prevent harm or injury to anyone on site;

C. Any person who has signs or symptoms of COVID-19, or who has been exposed to COVID-19 is not permitted on the job site;

D. Any fines issued by a Federal, State or Local government for violation of any COVID-19 Law, Order or Rule, shall be paid by the Bidder/Contractor;

E. The Owner shall not be penalized for any delay due to COVID-19 issues; and

F. The Owner and Bidder/Contractor acknowledge that the Laws, Orders and Rules related to COVID-19 may change during this project and agree to abide by same.

G. The following provision shall apply to all Contract Documents in general and specifically to:

1. Standard General Conditions Sections 4.05, 13.05(B) and (C); 16.01, and 16.04;
2. Supplementary Conditions, Section 5(A); and
3. Special Conditions Section 20.

H. In the event that any Federal, State or Local Statute, Law, Rule, Ordinance or Executive Order related to the Coronavirus or COVID-19 which requires the Contractor or its Sub-Contractors to stop work and/or if illness due to COVID-19 causes the Contractor or its Sub-Contractors to stop work, the Owner shall not be

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responsible for the cost of any equipment on site, or scheduled to be delivered to the site, which has been purchased, rented or leased by the Contractor or its Sub-Contractors, during the period for which the work has been stopped or delayed as is set forth herein.

END OF SECTION

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## SPECIAL CONDITIONS

### 1. **SCOPE**

The intent of this section is to describe and clarify special conditions which relate to this project. Special Conditions which differ (or are in conflict) with the Supplemental Conditions - or the policies of other agencies (public or private) which have jurisdiction by law - shall be brought immediately to the attention of the Engineer.

### 2. **TOOLS, MANPOWER, AND EQUIPMENT**

If - at any time before the commencement or during the progress of the work - the tools, manpower, or equipment appears to the Engineer to be insufficient, inefficient, or inappropriate to secure the quality of work required (or the proper rate of progress), the Engineer may order the Contractor to increase the efficiency, to improve the character, to increase the number, or to substitute new tools, plant, or equipment (as the case may be) and the Contractor must conform to such order.

Before executing any subcontract, the successful Bidder as Contractor shall submit the name of any proposed subcontractor for prior approval.

### 3. **PERMITS**

The Engineer has endeavored to obtain all permits (unless indicated elsewhere), with the exception of Local Building Permits and Highway Work Permits. Contractor shall promptly apply for all permits which are required for completion of the work. Contractor shall complete all application forms, pay all fees or bonds, and provide documentation as requested by the permit agency.

### 4. **APPROVABLE MANUFACTURERS OR SUPPLIERS**

Where "Approved Manufacturers or Suppliers" are listed, or where a particular manufacturer's products are listed, the reference shall be taken to include the qualification of "or equal as approved by the Engineer." If Contractor proposes "or-equal" items, the burden for demonstrating this equivalency shall rest on the Contractor. The Engineer shall retain the right of approval over proposed "or-Equal" items and shall in making an evaluation and determination consider the durability, reliability, life-cycle costs, ease of repair, technical service, and other like factors in addition to the proposed substitutes attainment of design standards for the new product. The only allowable equipment is such that is manufactured in the United States.

### 5. **PERFORMANCE WARRANTY**

The Contractor shall furnish (at the Contractor's expense) a **one (1)** year Warranty, with respect to all materials, equipment, and construction, equal to **25** percent of the contract price. This Warranty shall be provided upon Substantial Completion of the work, regardless of earlier occupancy or use of parts of the work. All Warranty issues identified by the Engineer in writing during the **one (1)** year Warranty period shall be resolved by the Contractor to the Owner's satisfaction. If authorized by the Engineer, the Owner may require the Contractor to furnish (at the Contractor's expense) a special performance Warranty or other surety over and above the **one (1)** year Warranty, with respect to materials or equipment substitutions. If Contractor fails to act to resolve Warranty issues within 30 days of written notice, or such lesser period as may be dictated by the Owner's needs to use facilities subject to the Warranty, the Contractor will be considered to be in default of his Warranty obligations. In the event of such default, Owner may make other arrangements to remedy the Warranty problem and claim all direct and incidental costs against Contractor's Warranty Bond.

### 6. **MAINTENANCE OBLIGATION**

If, at any time during the performance of the Contract, defects in the work shall develop or be discovered, the Contractor shall promptly repair or replace the defective workmanship or materials even though such workmanship or materials have already passed inspection. The Contractor will be



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required to perform maintenance in all areas of finished road surfaces where defects and/or settlement has occurred. These areas shall be repaired promptly and under the direction of the Engineer with the materials and procedures stated in the Specifications section that applies.

Contractor shall furnish and maintain fuel, electric, and consumable supplies (such as chemicals) from the period of initial start-up of systems until Substantial Completion for the Work and acceptance by the owner.

The Contractor shall maintain all areas of work and storage in a neat and orderly condition at all times.

The Contractor - at the end of each day - will be required to remove (and dispose of properly) scattered piles of debris, surplus materials, construction equipment, or any obstructions deemed by the Engineer (or any other agency having Jurisdiction) which create a health or safety hazard to the public.

The Contractor shall keep all existing facilities - such as storm drains, culverts, catch basins, ditches, and all public and private utilities in the area of construction - clean and operational during construction. All excavations shall be backfilled to grade at the end of each day, unless the Engineer approves the use of fencing and barricades. At the end of each day, all areas disturbed (which are used for public or private, pedestrian or vehicular traffic) shall be made accessible for its intended use, with proper signs and safety devices installed for the protection of the public. As work progresses in the various areas of construction, all traffic areas shall be kept broom-cleaned, with a dust suppressor used as directed by the Engineer. Prior to final restoration, all areas disturbed during construction shall be maintained. Clean-up of areas requested by the Engineer shall be done promptly and to the satisfaction of the Engineer.

**7. LIQUIDATED DAMAGES**

The OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the work is not completed within the times specified In the Contract Agreement plus any extensions thereof allowed in accordance with Article 11, "Change of Contract Time", of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving legal arbitration proceeding the actual loss suffered by the OWNER if the work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as penalty), CONTRACTOR shall pay OWNER, for each day that expires after the time specified in the Contract Standard Form of Agreement, the following Stipulated Penalties: (see Standard Agreement)

**8. CONSTRUCTION DOCUMENTATION**

A. "As-Built" Drawings: The Contractor shall note, on a set of the Contract Drawings kept especially for this purpose, the final locations and details of construction, the location of underground utilities, and obstructions, and any other pertinent information necessary for preparation of "As-Built" drawings.

B. Photographs: The Contractor shall furnish preconstruction photographs (or videotapes), to show the conditions existing prior to construction. Photographs shall be legible, complete, and marked with the direction of view, station, and date. The Contractor shall furnish Progress photographs shall be taken monthly and as directed by the Engineer. Original prints and negatives for Preconstruction and Progress Photographs shall be furnished to the Engineer and shall become part of the record to be retained by the Owner upon completion of the project.

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**9. COMMUNICATIONS**

A. Written Communications: All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing. Any notice to or demand shall be sufficiently given if delivered at address stated on the signature page of the Agreement. Any such notice shall be deemed to have been given as of the time of actual delivery. All urgent matters should be sent by Overnight Mail or by facsimile with an original by Registered Mail.

B. Project Meetings: Contractor shall arrange meetings, schedule attendance of necessary parties, and record and distribute minutes. Meetings shall include, at a minimum, Pre-construction Conference, Bi-Weekly Progress Meetings (as needed), Substantial Completion Meeting, and Final Inspection. At routine Progress Meetings, the Contractor shall present: a review of work progress since the previous meeting, conflicts and resolutions for problems, scheduling issues or delays and their resolution, potential changes orders or delays, and other business as directed by the Engineer in advance of the meeting.

**10. PAYMENT TO CONTRACTOR**

Progress payments will be made to the Contractor by the Owner, based on a monthly work performance period ending on the last day of the month. The estimate for in-place work performed during the preceding period must be duly certified and approved by the Owner. The Contractor will be directed in writing as to the schedule on which payments must be submitted.

At the sole discretion of the Owner, and in consideration of the general progress of the work, partial payments may be made for materials delivered and stored on the project site. Payments will be only in the amount of the raw materials costs, as documented by paid receipts, and may not exceed any scheduled value of the material.

All work paid for shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of the work for which payments have been made or the restoration of any damaged work, or as a waiver of the right of the owner to require fulfillment of all terms of the Contract.

**11. SCHEDULING AND WORK HOURS**

Unless special permission is given by the Engineer, all work shall be done between 7:00 A.M. and 5:00 P.M., Monday through Friday. Contractor shall prepare, coordinate, and maintain the contract completion schedule. Where requested by the Engineer due to the complexity of the project, the Schedule presented shall be a "bar-type" schedule which shows major tasks, completion dates, and potential conflicts. Contractor shall revise Construction Progress Schedule monthly to reflect changes in progress of the work. The Contractor shall be solely responsible for obtaining any dispensation required by the Department of Labor for overtime, night, holiday, or weekend work, as well as for payment of wage supplements required as a result.

**12. SUBMITTALS**

A. Shop Drawings: CONTRACTOR shall review Shop Drawings and product data prior to submittal, verify field dimensions and suitability, document conformance with the Plans, and schedule submittals so as to not delay the work. Contractor shall review and note his approval on each submittal, prior to its delivery to the Engineer. Each submittal shall be numbered, identify the manufacturer, list model or part numbers, provide weights and dimensions, and include any other pertinent data required by Engineer for review. Upon approval, Contractor shall distribute approved submittals to the Contractor's field office, and to Subcontractors, suppliers, fabricators and other Contractor's affected. Contractor shall allow up to 14 days review by the Engineer, and should specifically request expedited review if needed. Submit at least three (3) copies for review.

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B. Test Results: Results of concrete, soil, and other materials testing (where required) shall be distributed to the Engineer, the Engineer's Field Office, and affected Subcontractor's immediately upon receipt of the data. Contractor shall review test results and note any results which do not meet the project requirements.

C. Operation and Maintenance Data: Contractor shall compile manuals, installation instructions/packing documents, and copies of purchase orders for all components installed and bind these documents into an Owner's O&M Manual. Manual shall be indexed and tabbed and suitable for use by the Owner and Operator. Submit Draft for Engineer's approval and three (3) final copies, Engineer will retain two copies.

**13. LAYOUT OF WORK**

The contractor shall perform all layout work necessary for the satisfactory execution of the construction for the contract as shown on the contract Drawings, and all costs in connection therewith shall be included in the Contract price(s). The contractor shall verify all dimensions on the drawings and shall be responsible for same.

All construction shall be installed to the lines and grades as shown on the Contract Plans. Any discrepancies, obstructions, or conflicts, which are encountered, shall be brought to the immediate attention of the Engineer in the field. All work shall be laid out a minimum of 200 feet in advance. All existing utilities and underground structures or facilities are to be located by the Contractor a minimum of fifteen hundred (1500) feet ahead of actual construction. Any abrupt changes in vertical or horizontal alignment, slope, or field conditions which differ substantially from the Contract Plans and Specifications shall be brought to the attention of the Engineer in writing.

The Contractor will be held responsible for the protection and safe-guarding of all control points and bench marks set by the Engineer for this Contract. Any replacement or re-establishment of control points or bench marks by the Engineer shall be at the expense of the Contractor for whom the bench mark was originally set.

**14. LIMIT OF WORK AREA**

Easements for the purpose of this Contract will be provided by the Owner. If the Contractor desires the temporary use, during construction, of lands to which the Owner has no rights, the Contractor shall secure written permission from the appropriate property owners and shall file a duplicate copy of such permission with the Engineer. Land shall not be used or occupied by the Contractor prior to the securing of permission. The Contractor shall at all times save harmless the Owner from actions by third parties, by reason of any acts or omissions by the Contractor.

Before final acceptance of the work - and as a prerequisite to the release of the final payment - the Contractor shall secure a written release - from the authorities or owners having jurisdiction over the lands (including easements) occupied by the Contractor - certifying to the satisfactory restoration of all pavements, other surfaces, and utility structures removed or safeguarded for the-work.

The Contractor shall confine all materials - and their storage and the operations of the Contractor's workmen - to the limits indicated by laws, ordinances, permits, directions of the Engineer, and as shown on the Plans. The Contractor will not unreasonably encumber the premises with such materials, but shall store them in orderly fashion, such that they will not interfere with the work under this Contract (or other contracts) or with the operation of the owner's facilities.

Should the Owner provide the land for materials, equipment, trailers, and automobiles, such items shall be stored in the areas designated on the Plans. The Contractor shall mark and place barriers to limit such storage areas.

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**15. TEMPORARY FACILITIES**

A. General: The Contractor, shall provide temporary power, heating, telephone, and water service, and the sanitary facilities, for his operations throughout the construction period. At the completion of the work, or when the temporary services are no longer required, the temporary facilities shall be restored to their original conditions. All costs in connection with the temporary utilities - including, but not limited to, installation, utility company service charges, maintenance, relocation, and removal - shall be borne by the Contractor. Contractor shall furnish and maintain fuel, electric, and consumable supplies (such as chemicals) from the period of initial start-up of systems until Substantial Completion for the Work and acceptance by the owner.

B. Specific Facilities Required: Provide and maintain signage, traffic warning and control devices, and flagmen as required to provide safe working conditions, limit the risk of accidents, and meet the requirements of the appropriate authorities. Provide and maintain temporary sanitary toilet facilities conforming to state and local health and sanitation regulations, in sufficient number for use of Engineer's, Contractor's and Subcontractor's employees. Provide and maintain secure enclosed storage facilities or fencing for equipment and materials stored on site. Provide and maintain temporary lighting meeting code requirements and sufficient to enable Contractor to complete Work and Engineer to observe work as it is being performed. Provide and maintain temporary heat and construct temporary enclosures as necessary for proper completion of the work. Make arrangements and pay fuel costs, supervise, and maintain heating units. Construct and maintain temporary site roadways in snow free, ice free, driveable condition necessary to carry out construction operations. For Contracts exceeding \$1-million in value or six months in duration, the Contractor shall provide the Engineer with office space on-site, which shall include screened windows and lockable doors with minimum floor area of 200 sq ft, heat, water, electricity, phone line, furniture, telephone/facsimile machine and photocopy machine.

C. Housekeeping: The Contractor shall keep the work and storage areas in a neat and orderly condition at all times. All scattered piles of material, trash, and debris shall be cleaned up daily and removed from the site weekly - or more frequently, as directed by Engineer. The Contractor shall store all potentially hazardous materials in a manner approved by the Engineer and keep all equipment and machinery in good working order. Any leaks, spills, or discharges created by or as a result of construction shall be promptly and thoroughly cleaned up, according to the rules and regulations prescribed by NYSDEC.

**16. PROJECT SIGNS**

The project sign, if required, shall be furnished and installed by Contractor. Each Contractor shall be responsible for providing their own traffic control signs and other safety signs as required.

**17. ENVIRONMENTAL CONTROLS**

Contractor shall: provide erosion control measures in place before commencing work on project site, maintain erosion control measure during construction, and remove erosion control measures upon establishment of permanent, surface stabilization. Contractor shall take such measures as may be required to prevent degradation of stream water quality during his work.

Site clearing will be limited to the area shown on the plans unless otherwise approved by the Engineer. Trees and brush may not be piled on the site, and shall be cut up and removed as clearing progresses.

Any excess soil and rock removed from the site shall be disposed at a point designated by the Owner. All brush and debris removed from the site shall be disposed as listed above or disposed at Contractor's expense in accordance with NYSDEC requirements.

Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use.

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Do not burn trash on construction site. Maintain road and work areas so as to control dust through water spray or other means. Generally, no visible dust should result from traffic or operations.

Conduct operations to minimize disturbance to residents in vicinity of Work, and comply with applicable local ordinances. Assure that exhaust mufflers and silencer devices are in good working order. Maintain noise levels below 50 decibels at the property lines where homes or commercial property abut the construction site.

Route vehicles carrying rock, concrete or other material over such streets as will cause least annoyance to public and do not operate on public streets between hours of 6:00 p.m. and 7:00 a.m., or on Saturdays, Sundays or legal holidays unless approved by Owner.

Fuel storage area and fuel equipment shall be approved by Owner prior to installation. Submit containment provisions to Owner for approval. Report spills or leaks from fueling equipment or construction equipment to Owner and cleanup as required. Owner may require Contractor to remove damaged or leaking equipment from Project site. Do not change oil on equipment or store or dispose of fuels, solvents, lubricants, or other potentially hazardous materials on site.

**18. FAMILIARITY WITH SITE CONDITIONS**

The Contractor shall inspect the site and become acquainted with all the field conditions on which the work is dependent. The Contractor is advised that sheeting, shoring, bracing, and dewatering of excavation may be required for the safety of excavations where required by subsoil conditions. No extra costs will be allowed by this work. The Contractor acknowledges satisfaction as to the nature and location of the work; the general and local conditions - particularly those bearing upon transportation, disposal, handling and storage of materials; availability of labor, water, electric power, and roads; the uncertainties of weather, ground water table, or similar physical conditions at the site; the conformation and condition of the ground; the character, quality, and quantity of surface and subsurface materials to be encountered; the character of equipment and facilities needed prior to and during the prosecution of the work; and -all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the contractor in becoming acquainted with all the available information concerning these conditions will not relieve him of the responsibility for estimating properly the difficulty or cost of successfully performing the work.

**19. TESTING LABORATORY**

Contractor shall employ testing labs as required in the Specifications. Additional testing shall also be conducted (at the Contractors expense) when directed by the Engineer, to verify the conformance of the work with the specifications.

**20. TEMPORARY SUSPENSION OF WORK DUE TO WEATHER**

All work to be performed under the Contract shall be completed within the time stated in the Agreement or within such extended time for completion as may be granted by Change Order. If, during the progress of the work, it should become necessary because of the lateness of the season, to stop the work, the Contractor shall open proper drainage ditches, erect temporary structures, install temporary materials, and winterize the project so that there will be a minimum of interference with traffic or deterioration of the work already performed. Temporary materials - such as bituminous asphalt, cold mix, and calcium chloride - shall be installed and maintained throughout the Winter. Temporary materials shall be graded and compacted to keep the Contract in First Class condition for snow plows and traffic. The Contractor shall take every precaution to prevent any damage or unreasonable deterioration of the work during the time the project is shut down. Unless there are exceptions specifically approved by the Engineer, seasonal limitations for material installations shall be as specified in the NYSDOT Standard Specifications. All materials, labor, and equipment necessary to winterize the project shall be the responsibility of the Contractor. No payment will be

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made for any temporary work. The cost anticipated shall be incorporated into the bid items of the Bid Proposal.

**21. MATERIAL, CONTROL, AND CERTIFICATION**

A. Certifications: Material certifications from manufacturers and/or suppliers shall be supplied for each product cited in the appropriate Section of the Specifications, or as requested by the Engineer prior to installation. Additional testing, certifications, or performance guarantees may be required on material or product substitutions anticipated for use by the Contractor. All additional costs associated with any substitutions shall be borne by the Contractor (as stated in the General Conditions, Article 7.05).

B. Controls: Unless otherwise specified, all materials shall be new and of first quality. The source of supply of each of the materials shall be approved by the Engineer before delivery is started. Representative preliminary samples (of the character and quality specified) shall be submitted by the Contractor or producer for examination, -and tests shall be conducted in accordance with A.S.T.M. or other generally-recognized standards which regulate the particular industry or product. Only materials so tested and found to conform to the requirements of these Specifications shall be used in the work. All materials proposed for such incorporation may be inspected or tested at any time during their preparation or use. If, after trial, it is found that some approved sources of supply do not provide a uniform, acceptable product, the Contractor shall furnish the acceptable material from other approved sources. No material which, after approval, has in any way become unfit for use shall be used in the work, and stored material - even though approved prior to being stored - shall be inspected before use in the work and shall meet the requirements of the Specifications at the time of such use.

**22. PROJECT CLOSE-OUT.**

A. Prerequisites

The contractor shall comply with all the General Conditions and complete the following before requesting a final inspection and Certificate of Substantial Completion:

1. Submit executed warranties, workmanship bonds, maintenance agreements, Inspection certificates, and similar required documentation for specific units of work enabling Owner's unrestricted occupancy and use.
2. Submit record documentation, maintenance manuals, tools, spare parts, keys, and similar operational Items.
3. Complete instruction of owner's operating personnel and start-up of systems.
4. Complete final cleaning and remove temporary facilities and tools.
5. Submit executed close-out documents, including: Release of Liens, Surety's Release, Warranty Bonds (where required in the Supplemental Conditions or as a result of the conditional acceptance of work or materials), written Release of Claims for subcontractors or suppliers (when required by the Engineer).
6. Obtain approvals including Occupancy Permit, Electrical Underwriters Certificate, releases and approvals for work done in easements, and such other approvals as may be required to allow full use by the Owner of the completed works unencumbered by Liens or Claims resulting from the Work.

B. Record Documents

The Contractor shall furnish the following:

1. The Contractor shall note, on a set of contract drawings kept especially for this purpose, the final locations and details of construction, the location of underground utilities and obstructions, and any other pertinent information necessary for preparation of "As-Built" drawings.

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2. Operation and Maintenance Manuals - The Contractor shall request from the -supplier/manufacture a minimum of three (3) copies of such documents, to be provided to the Engineer for each piece of equipment and system installed.
  3. Installation Instructions and Catalog Cuts - The contractor shall provide the Owner with one (1) copy of all installation instructions received for items such as light fixtures, door hardware, etc.
  4. Equipment Start-up - The Contractor shall provide, as part of the Contract, a qualified Manufacturer's Representative to: Inspect the installation, Service the equipment (as required), Adjust and calibrate the equipment (as necessary), Instruct the owner's Representative in the operation and maintenance of the equipment, and provide a written report and certification to the Contractor and the Engineer, for each piece of equipment or system in the Contract.

C. FINAL CLEANING

At the time of Project Close-out, the Contractor shall clean (or re-clean) the work to the condition expected from a normal, well maintained facility, including: Remove non-permanent protection and labels, Polish glass, Clean exposed finishes, Touch-up minor finish damage, Clean or replace mechanical system filters, Remove debris, Broom-clean unoccupied spaces, Clean light fixtures and replace burned-out lamps, Sweep and wash paved areas, Clean yard and grounds.

23. **DRAWINGS AND SPECIFICATIONS - DEFINITIONS AND PRECEDENCE**

A. GENERAL

The intent of the Plans and Specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work, in accordance with the Contract Documents. It is understood, that the Contractor is familiar with construction projects of this type and size, and that generally-accepted construction practices will be applied in order to complete the project in an acceptable manner. All incidental work, whether or not it is shown in the Plans or stated in the specifications, is expected to be, carried out in order to achieve the desired result - which is a complete facility, ready for use, occupancy, or operation by the Owner.

B. DEFINITION AND PRECEDENCE

1. In case of a conflict between the Plans and the Specifications, the Specifications shall govern.
2. Dimensions on the Drawings shall govern over scaled dimensions.
3. Detail Drawings shall govern over general Drawings.
4. General Notes on the Plans apply to all Contract areas.
5. Special Notes on a plan apply to a specific Drawing or condition of the Plans.
6. The Standard General Conditions of the Contract set forth the principal Contract provisions governing the main parties involved. The General Conditions define the rights, responsibilities, and relationships of those parties.
7. The Special Conditions of the Contract modify and adapt the standardized General Conditions to fit the specific requirements of the project.
8. The Supplemental Conditions of the Contract - describe or identify the general rules and regulations of the other parties, which have (in whole or in part) involvement in the project by law.
9. The Contract Specifications - set forth technical information concerning materials, components, systems, and equipment to be furnished and installed - as indicated in the Contract Plans. These Specifications state the quality, performance, characteristics, and results to be achieved by application of construction methods.

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C. RESOLUTION OF DISCREPANCIES

Any discrepancies found between the Drawings, the Specifications, and the site conditions - or any other inconsistencies or ambiguities - shall be reported immediately in writing to the Engineer, who shall promptly respond (in writing) to correct the situation. Any work performed by the Contractor (after the discovery of such discrepancies) shall be done at the Contractor's risk.

END OF SECTION



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## **Exhibit A**





Andrew M. Cuomo, Governor

Roberta Reardon, Commissioner

Village of Suffern

Anthony Mantas, Engineer I  
28 Madison Avenue Extension,  
Delaware Engineering DPC  
Albany NY 12203

Schedule Year 2020 through 2021  
Date Requested 09/08/2020  
PRC# 2020009307

Location Village of Suffern WWTP  
Project ID# No1  
Project Type This work consists of a new headworks building and upgrades to the existing trickling filters.

### 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](http://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](http://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](http://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](http://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 journeymen 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 journeyman'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

Village of Suffern

Anthony Mantas, Engineer I  
28 Madison Avenue Extension,  
Delaware Engineering DPC  
Albany NY 12203

Schedule Year 2020 through 2021  
Date Requested 09/08/2020  
PRC# 2020009307

Location Village of Suffern WWTP  
Project ID# No1  
Project Type This work consists of a new headworks building and upgrades to the existing trickling filters.

### 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  
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240



### **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](http://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](mailto: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](http://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*

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#### **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](mailto: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](http://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](http://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](http://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

## Rockland County General Construction

### Boilermaker

09/01/2020

#### 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

09/01/2020

#### JOB DESCRIPTION Carpenter

DISTRICT 8

#### ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

#### WAGES

Per hour: 07/01/2020

Piledriver	\$ 55.93
Dockbuilder	\$ 55.93

## SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 52.44

## OVERTIME PAY

See (B, E2, O) on OVERTIME PAGE

## HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

## REGISTERED APPRENTICES

Wages per hour

(1)year terms:

1st	2nd	3rd	4th
\$22.37	\$27.97	\$36.35	\$44.74

Supplemental benefits per hour:

All Terms: \$ 34.34

8-1556 Db

## Carpenter

09/01/2020

**JOB DESCRIPTION** Carpenter

**DISTRICT** 8

## ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

## WAGES

Per hour: 07/01/2020

Carpet/Resilient

Floor Coverer \$ 54.00

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

## SUPPLEMENTAL BENEFITS

Per hour:

\$ 46.99

## OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

## HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

## REGISTERED APPRENTICES

Wage per hour - (1) year terms:

1st	2nd	3rd	4th
\$24.20	\$27.20	\$31.45	\$39.33

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$16.06	\$17.56	\$21.16	\$23.16

8-2287

## Carpenter

09/01/2020

**JOB DESCRIPTION** Carpenter

**DISTRICT** 8



## ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

## WAGES

Per Hour: 07/01/2020

Marine Construction:

Marine Diver	\$ 70.80
Marine Tender	50.34

## SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 52.34

## OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

## HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

## REGISTERED APPRENTICES

Wages per hour:

One (1) year terms.

1st year	\$ 22.37
2nd year	27.97
3rd year	36.35
4th year	44.74

Supplemental Benefits

Per Hour:

All terms \$ 34.34

8-1456MC

## Carpenter

09/01/2020

**JOB DESCRIPTION** Carpenter

**DISTRICT** 8

## ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

## WAGES

Per hour: 07/01/2020

Building	
Millwright	\$ 55.70

## SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 54.16

## OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

## HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

## REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$29.99	\$35.44	\$40.89	\$51.79

Supplemental benefits per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
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8-740.1

## 09/01/2020

\*\*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
\$ 22.40	\$ 26.16	\$ 28.05	\$ 29.93	\$ 33.70

### Indentured before July 1 2016

1st	2nd	3rd	4th
\$ 22.40	\$ 26.16	\$ 29.93	\$ 33.70

### SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.28

11-279.1B/HH

## Electrician

09/01/2020

### JOB DESCRIPTION Electrician

DISTRICT 11

### ENTIRE COUNTIES

Orange, Putnam, Rockland

### PARTIAL COUNTIES

Dutchess: Towns of Fishkill, East Fishkill, and Beacon.

## WAGES

Per hour:

	07/01/2020	04/01/2021
Electrician Wireman/Technician	\$ 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	\$ 53.97	\$ 55.15
Shift worked between 12:30am & 8:30am	\$ 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

11-363/1

**Elevator Constructor**

**09/01/2020**

**JOB DESCRIPTION** Elevator Constructor

**DISTRICT 4**

**ENTIRE COUNTIES**

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

**PARTIAL COUNTIES**

Rockland: Entire County except for the Township of Stony Point

Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

**WAGES**

Per hour:

	07/01/2019	03/17/2021
Elevator Constructor	\$ 69.56	\$ 72.29
Modernization & Service/Repair	\$ 54.56	\$ 56.77

**SUPPLEMENTAL BENEFITS**

Per Hour:

Elevator Constructor	\$ 41.92	\$ 42.92
Modernization & Service/Repairs	\$ 40.86	\$ 41.82

**OVERTIME PAY**

Constructor See ( D, M, T ) on OVERTIME PAGE.

Modern/Service See ( B, F, S ) on OVERTIME PAGE.

**HOLIDAY**

Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**

WAGES PER HOUR:

\*Note: 1st Term is based on Average wage of Constructor & Modernization.

Terms 2 thru 4 Based on Journeymans wage of classification Working in.

1 YEAR TERMS:

1st Term*	2nd Term	3rd Term	4th Term
50%	55%	65%	75%

#### SUPPLEMENTAL BENEFITS

##### Elevator Constructor

1st Term	\$ 33.38	\$ 34.05
2nd Term	34.20	34.91
3rd Term	35.55	36.30
4th Term	36.89	37.70

##### Modernization & Service/Repair

1st Term	\$ 33.33	\$ 34.00
2nd Term	33.82	34.50
3rd Term	35.09	35.83
4th Term	36.36	37.15

4-1

#### Elevator Constructor

09/01/2020

#### 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 Journeyperson/Helper

1-138

<b>Glazier</b>	<b>09/01/2020</b>
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**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 & Window Film	29.17	
**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
Journeyworker	\$ 34.59
Glass tinting & Window Film	20.29
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)

<b>Insulator - Heat &amp; Frost</b>	<b>09/01/2020</b>
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**JOB DESCRIPTION** Insulator - Heat & Frost

**DISTRICT 8**

**ENTIRE COUNTIES**

Dutchess, Orange, Putnam, Rockland, Westchester

**WAGES**

Per hour:	07/01/2020	05/31/2021
Insulator	\$ 55.00	\$ 2.00
Discomfort & Additional Training**	57.96	
Fire Stop Work*	29.44	

\* Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

\*\*Applies to work requiring: garb or equipment worn against the body not customarily worn by insulators; psychological evaluation; special training, including but not limited to "Yellow Badge" radiation training

Note: Additional \$0.50 per hour for work 30 feet or more above floor or ground level.

#### **SUPPLEMENTAL BENEFITS**

Per hour:

Journeyworker	\$ 34.35
Discomfort & Additional Training	36.30
Fire Stop Work: Journeyworker	17.52

#### **OVERTIME PAY**

See (B, E, E2, Q, \*T) on OVERTIME PAGE

#### **HOLIDAY**

Paid: See (1) on HOLIDAY PAGE

Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See ( 2\*, 4, 6, 16, 25 ) on HOLIDAY PAGE.

\*Note: Labor Day triple time if worked.

#### **REGISTERED APPRENTICES**

(1) year terms:

Insulator Apprentices:

1st	2nd	3rd	4th
\$ 29.44	\$ 34.55	\$ 39.66	\$ 44.78

Discomfort & Additional Training Apprentices:

1st	2nd	3rd	4th
\$ 30.99	\$ 36.41	\$ 41.83	\$ 47.26

Supplemental Benefits paid per hour:

Insulator Apprentices:

1st term	\$ 17.52
2nd term	20.89
3rd term	24.25
4th term	27.61

Discomfort & Additional Training Apprentices:

1st term	\$ 18.50
2nd term	22.06
3rd term	25.62
4th term	29.18

8-91

**Ironworker**

**09/01/2020**

**JOB DESCRIPTION** Ironworker

**DISTRICT** 4

**ENTIRE COUNTIES**

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

**PARTIAL COUNTIES**

Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

### WAGES

Per hour: 07/01/2020

Reinforcing &  
Metal Lathing \$ 56.25

"Base" Wage \$ 54.70  
plus \$ 1.55

"Base" Wage is used to calculate overtime hours only.

### SUPPLEMENTAL BENEFITS

Per hour:

Reinforcing &  
Metal Lathing \$ 38.30

### OVERTIME PAY

See (B, E, Q, \*X) on OVERTIME PAGE

\*Only \$22.00 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half \$ 45.08  
Double Time \$ 51.33

### HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 13, 18, 19, 25) on HOLIDAY PAGE

### REGISTERED APPRENTICES

(1) year terms at the following wage rates:

Wages Per Hour:

1st term	2nd term	3rd term	4th Term
\$ 22.55	\$ 28.38	\$ 34.68	\$ 37.18

### SUPPLEMENTAL BENEFITS

Per Hour:

1st term	2nd term	3rd term	4th Term
\$ 18.17	\$ 21.34	\$ 22.00	\$ 20.50

4-46Reinf

### Ironworker

09/01/2020

**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

### 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

09/01/2020

**JOB DESCRIPTION** Laborer - Building

**DISTRICT** 11

### ENTIRE COUNTIES

Rockland

### WAGES

GROUP C: Liners, joint setters.

GROUP D: Air track operators.

GROUP E: Sealers, power buggy operators, mixer men, brush king, jack hammer, pavement breakers, vibrator men, powder men, torchmen, cement spray men.

GROUP F: Hazardous Waste Handler, Asbestos Removal, Mold Removal, Lead Removal and Bio Remediation where protective gear is needed.

GROUP H: Mason tender, rip rap and dry stone layers, concrete laborer, pipe layers, signal men, gabion basket assemblers, asphalt men, wrecking and demolition men.

GROUP I: Landscaping, flagmen, pitmen, dump men, temporary heat, building laborer (clean up).

WAGES: (per hour)	07/01/2020	05/01/2021 Additional \$ 2.05	05/01/2022 Additional \$ 2.10
GROUP C	\$ 41.05		
GROUP D	41.60		
GROUP E	40.75		
GROUP F	42.75		
GROUP H	40.51		
GROUP I	37.50		

SHIFT DIFFERENTIAL: On all Governmental mandated or irregular or off shift work, an additional 20% of the wage will be paid hourly.

NOTE: All work five feet or more outside the building foundation line shall be deemed Heavy & Highway

### SUPPLEMENTAL BENEFITS

Per Hour:

Journeyman \$ 26.13

### OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

## HOLIDAY

Paid: See ( 1 ) on HOLIDAY PAGE.  
Overtime: See ( 5, 6, 15, 25 ) on HOLIDAY PAGE.

## REGISTERED APPRENTICES

(1000) hour terms at the following wages.

1st	2nd	3rd	4th
\$ 20.77	\$ 24.37	\$ 26.96	\$ 31.56

Supplemental Benefits per hour:  
All Terms \$ 21.75

11-754B

## Laborer - Heavy&Highway

09/01/2020

**JOB DESCRIPTION** Laborer - Heavy&Highway

**DISTRICT** 11

## ENTIRE COUNTIES

Rockland

## WAGES

GROUP A: Certified Traffic Control

GROUP B: Blaster, Screed Men

GROUP C: Air track, joy drill

GROUP D: Asbestos, Hazardous Waste and lead abatement, bio remediation, phyto remediation where protective gear is required

GROUP E: Drill helper, concrete laborer, nipper, power buggy, mixer (machine or hand), brush king, jack hammer, wagon drill, job rig, pavement breaker, vibrator man, bit grinder, powder man, rip rap & dry stone layer, cement spray man, gunite nozzle man, spray & nozzle men on mulching & seeding machine, concrete saw, mason tender, pipe layer, gabion basket assembler, scalers, asphalt men, demolition men, bar man & helper, landscape men, ax man, pit and dump men, asbestos removal and hazardous waste removal where no protective gear is required

GROUP F: Flag person

WAGES: (per hour) 07/01/2020

GROUP A	\$ 45.00
GROUP B	47.00
GROUP C	43.50
GROUP D	43.50
GROUP E	41.75
GROUP F	38.20

SHIFT DIFFERENTIAL: On all NYS DOT or other Governmental mandated, irregular or offshift work, an additional 15% of the wage rate will be paid hourly

## SUPPLEMENTAL BENEFITS

Per hour:  
Journeyman \$ 26.03

## OVERTIME PAY

See (B, \*G, P, V, X) on OVERTIME PAGE

\*If Holiday falls on a Sunday double time is applicable

## HOLIDAY

HOLIDAY:  
Paid: See ( 5, 6, 15, 25 ) on HOLIDAY PAGE.  
Overtime: See ( 5, 6 ) on HOLIDAY PAGE.

## REGISTERED APPRENTICES

(1000) hour terms at the following wages.

1st	2nd	3rd	4th
\$ 20.77	\$ 24.37	\$ 26.96	\$ 31.56

Supplemental Benefits per hour:  
All Terms \$ 21.75

11-754H/H

## Laborer - Tunnel

09/01/2020

**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**

**09/01/2020**

**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
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

09/01/2020

**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	*plus 3% of
	wage paid	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

09/01/2020

**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

09/01/2020

**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	*plus 3% of	*plus 3% of	*plus 3% of

hourly wage

hourly wage

hourly wage

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**

**09/01/2020**

**JOB DESCRIPTION** Mason - Building

**DISTRICT 9**

**ENTIRE COUNTIES**

Nassau, Rockland, Suffolk, Westchester

**WAGES**

Per hour:	07/01/2020	12/07/2020
		Additional
Tile Finisher	\$ 46.21	\$0.73

**SUPPLEMENTAL BENEFITS**

Per Hour:

\$ 21.56\*  
+ \$9.65

\*This portion of benefits subject to same premium rate as shown for overtime wages

**OVERTIME PAY**

See (B, E, Q, \*V) on OVERTIME PAGE

Work beyond 10 hours on a Saturday shall be paid at double the hourly wage rate.

**HOLIDAY**

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88A-tf

**Mason - Building**

**09/01/2020**

**JOB DESCRIPTION** Mason - Building

**DISTRICT 9**

**ENTIRE COUNTIES**

Nassau, Rockland, Suffolk, Westchester

**WAGES**

Per hour:	07/01/2020	12/07/2020
		Additional
Tile Setters	\$ 60.09	\$0.88

**SUPPLEMENTAL BENEFITS**

Per Hour:

\$ 24.81\*  
+ \$9.72

\* This portion of benefits subject to same premium rate as shown for overtime wages.

**OVERTIME PAY**

See (B, E, Q, V) on OVERTIME PAGE

Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

**HOLIDAY**

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**

Wage per hour:

Tile Setters:

(750 hour) term at the following wage rate:



Term:	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	6001-6750	6501-7000
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:

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

\* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52A

<b>Mason - Building</b>	<b>09/01/2020</b>
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**JOB DESCRIPTION** Mason - Building

**DISTRICT** 11

**ENTIRE COUNTIES**

Putnam, Rockland, Westchester

**PARTIAL COUNTIES**

Orange: Only the Township of Tuxedo.

**WAGES**

Per hour:

07/01/2020

Bricklayer	\$ 42.09
Cement Mason	42.09
Plasterer/Stone Mason	42.09
Pointer/Caulker	42.09

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	\$ 35.00
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**OVERTIME PAY**

OVERTIME:

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

11-5wp-b

## Mason - Building

09/01/2020

**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

09/01/2020

**JOB DESCRIPTION** Mason - Heavy&Highway

**DISTRICT** 11

### ENTIRE COUNTIES

Putnam, Rockland, Westchester

### PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

### WAGES

Per hour:

07/01/2020

Bricklayer	\$ 42.60
Cement Mason	42.60
Marble/Stone Mason	42.60
Plasterer	42.60
Pointer/Caulker	42.60

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 \$ 34.99

## 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

11-5WP-H/H

## Operating Engineer - Building / Heavy&Highway

09/01/2020

**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-Trimmer-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, Quarrymaster (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**

**09/01/2020**

**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 \$ 40.31 \$ 41.42

Deck Captain, Leverman

Mechanical Dredge Operator

Licensed Tug Operator 1000HP or more.

CLASS A2 35.92 36.91

Crane Operator (360 swing)

CLASS B To conform to Operating Engineer  
Dozer, Front Loader Prevailing Wage in locality where work  
Operator on Land is being performed including benefits.

CLASS B1	34.86	35.82
Derrick Operator (180 swing)		
Spider/Spill Barge Operator		
Operator II, Fill Placer,		
Engineer, Chief Mate, Electrician,		
Chief Welder, Maintenance Engineer		
Licensed Boat, Crew Boat Operator		

CLASS B2	32.82	33.72
Certified Welder		

CLASS C1	31.92	32.80
Drag Barge Operator,		
Steward, Mate,		
Assistant Fill Placer		

CLASS C2	30.89	31.74
Boat Operator		

CLASS D	25.66	26.37
Shoreman, Deckhand, Oiler,		
Rodman, Scowman, Cook,		
Messman, Porter/Janitor		

**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**

**09/01/2020**

**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 (Recitifier 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

09/01/2020

**JOB DESCRIPTION** Painter

**DISTRICT** 1

### ENTIRE COUNTIES

Rockland

### WAGES

Wages per hour

07/01/2020

Brush/Paper Hanger	\$ 38.34
Dry Wall finisher	38.34
Sandblaster-Painter	38.34
Lead Abatement	38.34
Spray Rate	39.34

See Bridge Painters 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

Journeyperson \$ 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 Journeyperson'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

1-155ROC

**Painter - Bridge & Structural Steel**

**09/01/2020**

**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 + 11.86*	\$ .25 + 12.00*	\$ .25 + 12.24*
2nd year	\$ 10.20 + 17.79*	\$ 10.90 + 18.00*	\$ 10.90 + 18.36*
3rd year	\$ 10.20 + 23.72*	\$ 10.90 + 24.00*	\$ 10.90 + 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

09/01/2020

### 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
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2nd Term:	\$ 9.16	\$ 10.03	\$ 10.03
3rd Term:	\$ 9.16	\$ 10.03	\$ 10.03

8-1456-LS

## Painter - Metal Polisher

09/01/2020

**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

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

09/01/2020

**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
Plumber	\$ 34.59	Additional \$ 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

09/01/2020

**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

WAGES:(per hour)	07/01/2020	05/01/2021
Plumber/Steamfitter	\$ 46.70	Additional \$ 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

## Roofer

09/01/2020

**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****09/01/2020****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

**Sheetmetal Worker****09/01/2020****JOB DESCRIPTION** Sheetmetal Worker**DISTRICT** 4**ENTIRE COUNTIES**

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

**WAGES**

Per Hour:	07/01/2020	8/01/2020
Sign Erector	\$ 50.79	\$ 52.29

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

**SUPPLEMENTAL BENEFITS**

Per Hour:	07/01/2020	8/01/2020
Sign Erector	\$ 49.82	\$ 51.26

**OVERTIME PAY**

See (A, F, S) on OVERTIME PAGE

**HOLIDAY**

Paid:	See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE
Overtime:	See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

**REGISTERED APPRENTICES**

Per Hour:

6 month Terms at the following percentage of Sign Erectors wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
35%	40%	45%	50%	55%	60%	65%	70%	75%	80%

#### SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2020

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 13.96	\$ 15.81	\$ 17.68	\$ 19.56	\$ 27.26	\$ 29.65	\$ 32.80	\$ 35.26	\$ 37.71	\$ 40.15

8/01/2020

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 14.34	\$ 16.26	\$ 18.17	\$ 20.10	\$ 28.02	\$ 30.47	\$ 33.72	\$ 36.27	\$ 38.77	\$ 41.29

4-137-SE

#### Sprinkler Fitter

09/01/2020

**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

09/01/2020

**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**

**09/01/2020**

**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

**NYSDOL Bureau of Public Work Debarment List 07/28/2020**

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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

## **Exhibit B**





"General Decision Number: NY20200020 08/28/2020

Superseded General Decision Number: NY20190020

State: New York

Construction Types: Building, Heavy, Highway and Residential

County: Rockland County in New York.

BUILDING; HEAVY; HIGHWAY; AND RESIDENTIAL CONSTRUCTION PROJECTS  
(Includes single family homes and apartments up to and including 4 stories)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/03/2020
1	02/07/2020
2	02/28/2020
3	04/03/2020
4	05/01/2020
5	06/12/2020
6	07/03/2020
7	07/31/2020
8	08/28/2020

ASBE0091-001 05/27/2019

Rates Fringes

HAZARDOUS MATERIAL HANDLER (Duties limited to preparation, wetting, stripping, removal, scraping, vacuuming, bagging and disposing of all insulation materials whether they contain asbestos or not from mechanical systems).....\$ 42.62	40.85
Insulator/asbestos worker (Includes application of all insulating materials, protective coverings, coatings, and finishes to all types of mechanical systems).....\$ 42.62	40.85

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BOIL0005-001 01/01/2017

	Rates	Fringes
BOILERMAKER.....	\$ 55.23	33%+24.12+a

## FOOTNOTE:

a. PAID HOLIDAYS: New Year's Day, Thanksgiving Day, Memorial Day, Independence Day, Labor Day and Good Friday, Friday after Thanksgiving, Christmas Eve Day and New Year's Eve

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BRNY0005-005 06/01/2019

	Rates	Fringes
BRICKLAYER		
BUILDING/RESIDENTIAL CONSTRUCTION		
Bricklayers, Cement Masons, Plasterers, Stone Masons.....	\$ 42.09	34.50
HEAVY & HIGHWAY CONSTRUCTION		
Bricklayers, Cement Masons, Plasterers, Stone Masons, Pointers, Caulkers & Cleaners.....	\$ 41.96	33.38

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CARP0279-004 07/01/2019

	Rates	Fringes
Carpenters :		
Building and Heavy & Highway Construction.....	\$ 45.30	30.55
Residential.....	\$ 36.23	24.47

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CARP0740-001 07/01/2020

	Rates	Fringes
MILLWRIGHT.....	\$ 55.70	53.61

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CARP1556-006 07/01/2020

	Rates	Fringes
Dock Builder & Piledrivermen.....	\$ 55.93	51.79

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CARP1556-007 07/01/2020

	Rates	Fringes
Diver Tender.....	\$ 50.34	51.79
Diver.....	\$ 70.80	51.79

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CARP1556-010 07/01/2019

	Rates	Fringes
Pipe Bending Machine Operator....	\$ 54.63	50.98

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ELEC0363-006 04/01/2020

	Rates	Fringes
Electricians:		
BUILDING, HEAVY & HIGHWAY CONSTRUCTION.....	\$ 46.00	3%+32.36+a
RESIDENTIAL CONSTRUCTION....	\$ 46.00	3%+32.36+a

## FOOTNOTE:

a. Paid Holidays: New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Presidential Election Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving, Christmas Day

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ELEC1249-002 05/06/2019

	Rates	Fringes
ELECTRICIAN (LINE CONSTRUCTION-LIGHTING AND TRAFFIC SIGNAL INCLUDING ANY AND ALL FIBER OPTIC CABLE NECESSARY FOR THE TRAFFIC SIGNAL SYSTEMS, AND TRAFFIC MONITORING SYSTEMS, ROAD WEATHER INFORMATION SYSTEMS)		
Flagman.....	\$ 27.77	6.75%+24.15
Groundman (Digging Machine Operator).....	\$ 41.65	6.75%+24.15
Groundman (Truck Driver)....	\$ 37.02	6.75%+24.15
Groundman Truck Driver (Tractor Trailer Unit).....	\$ 37.02	6.75%+24.15
Lineman and Technician.....	\$ 46.28	6.75%+24.15
Mechanic.....	\$ 37.02	6.75%+24.15

## PAID HOLIDAYS:

a. Memorial Day, New Year's Day, President's Day, Good Friday, Decoration Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, and Election Day for the President of the United States and Election Day for the Governor of New York State, provided the employee works two days before or two days after the holiday.

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ELEC1249-004 05/06/2019

	Rates	Fringes
ELECTRICIAN (Line Construction)		
Overhead and underground distribution and maintenance work and all overhead and underground transmission line work including any and all fiber optic ground wire, fiber optic shield wire or any other like product by any other name manufactured for the dual purpose of ground fault protection and fiber optic capabilities :		
Flagman.....	\$ 31.23	6.75%+24.15
Groundman digging machine operator.....	\$ 46.85	6.75%+24.15
Groundman truck driver (tractor trailer unit).....	\$ 41.64	6.75%+24.15
Groundman Truck driver.....	\$ 41.64	6.75%+24.15
Lineman and Technician.....	\$ 52.05	6.75%+24.15
Mechanic.....	\$ 41.64	6.75%+24.15
Substation:		
Cable Splicer.....	\$ 57.26	6.75%+24.15
Flagman.....	\$ 31.23	6.75%+24.15
Ground man truck driver....	\$ 41.64	6.75%+24.15
Groundman digging machine		

operator.....	\$ 46.85	6.75%+24.15
Groundman truck driver (tractor trailer unit).....	\$ 41.64	6.75%+24.15
Lineman & Technician.....	\$ 52.05	6.75%+24.15
Mechanic.....	\$ 41.64	6.75%+24.15
Switching structures; railroad catenary installation and maintenance, third rail type underground fluid or gas filled transmission conduit and cable installations (including any and all fiber optic ground product by any other name manufactured for the dual purpose of ground fault protection and fiber optic capabilities), pipetype cable installation and maintenance jobs or projects, and maintenance bonding of rails; Pipetype cable installation		
Cable Splicer.....	\$ 58.71	6.75%+24.15
Flagman.....	\$ 32.02	6.75%+24.15
Groundman Digging Machine Operator.....	\$ 48.03	6.75%+24.15
Groundman Truck Driver (tractor-trailer unit).....	\$ 42.70	6.75%+24.15
Groundman Truck Driver.....	\$ 42.70	6.75%+24.15
Lineman & Technician.....	\$ 53.37	6.75%+24.15
Mechanic.....	\$ 42.70	6.75%+24.15

## FOOTNOTE:

a. PAID HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, Good Friday, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, and Election Day for the President of the United States and Election Day for the Governor of New York State, provided the employee works two days before or two days after the holiday.

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ELEC1249-008 01/01/2019

	Rates	Fringes
ELECTRICIAN (Line Construction) TELEPHONE, CATV FIBEROPTICS CABLE AND EQUIPMENT		
Cable splicer.....	\$ 32.78	3%+4.93
Groundman.....	\$ 16.49	3%+4.93
Installer Repairman- Teledata Lineman/Technician- Equipment Operator.....	\$ 31.12	3%+4.93
Tree Trimmer.....	\$ 25.79	3%+9.98+a

a. New Year's Day, President's Day, Good Friday, Decoration Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving, Christmas Day.

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ELEV0001-002 03/17/2018

	Rates	Fringes
ELEVATOR MECHANIC		

Elevator Constructor.....\$ 64.48	36.21+a+b
Modernization and Repair....\$ 50.49	40.399+a+b

## FOOTNOTE:

a. PAID HOLIDAYS: New Year's Day, Good Friday, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

b. PAID VACATION: An employee who has worked less than 5 years shall receive vacation pay credit on the basis of 4% of his hourly rate for all hours worked; an employee who has worked 5 to 15 years shall receive vacation pay credit on the basis of 6% of his hourly rate for all hours worked; an employee who has worked 15 or more years shall receive vacation pay credit on the basis of 8% of his hourly rate for all hours worked.

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ELEV0138-002 01/01/2020

## THE TOWN OF STONY POINT

	Rates	Fringes
ELEVATOR MECHANIC.....\$ 60.49		34.765+a+b

## FOOTNOTE:

a.Vacation: 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.

b. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

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ENGI0825-012 01/01/2018

## BUILDING HEAVY AND HIGHWAY, ROAD AND STREET CONSTRUCTION

	Rates	Fringes
Power equipment operators:		
GROUP 1.....\$ 50.57		30.30
GROUP 2.....\$ 48.98		30.30
GROUP 3.....\$ 47.07		30.30
GROUP 4.....\$ 45.44		30.30
GROUP 5.....\$ 43.73		30.30
GROUP 6.....\$ 52.39		30.30

## NOTES:

Hazmat Premium 20 percent  
Hydrographic Premium .50

## FOOTNOTE:

a. New Years Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day, Washington's Birthday, Election Day, and Veterans Day provided the employee works one day during the calendar week in which the holiday occurs.

## POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Autograde-Pavement-Profiler (CMI and Similar Types); Autograde Slipform Paver (CMI and Similar Types); Backhoe; Central Power Plants (all types); Concrete Paving Machine (s-240 and Similar Types); Cranes (All Types, Including Overhead And Straddle Traveling Type); Cranes, Gantry; Derricks (Land, Floating or Chicago Boom Type) Drillmaster/Quarrymaster (Down the Hole Drill) Rotary

Drill; Self-Propelled, Hydraulic Drill, Self-Powered Drill Draglines, Elevator Graders, Front End Loaders (5 yds. and over), Gradalls, Grader: Rago, Helicopters (Copilot), Helicopters, (Communication Engineer), Locomotive (large), Mucking Machines, Pavement and Concrete Breaker (Superhammer, Hoe Ram, Brokk 250 and Similar Types), Pile Driver (length of Boom Including Length of Leads Shall Determine Premium Rate Applicable), Pile Driver (length of boom including length of leads shall determine rate applicable), Roadway Surface Grinder Scooper (loader and shovel), Shovels, Tree Chopper with Boom, Trench Machines, Tunnel Boring Machines.

GROUP 2: ""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, Cableways, Carryalls, Concrete Pump, Concrete Pumping System, Pumpcrete and Similar Types, Conveyors, 125 ft and over; Drill Doctor (duties include dust collector, maintenance), Front End Loader (22 yds. but less than 5 yds.), Graders (Finish); Groove Cutting Machine (ride on type), Heater Planing; 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"" Hydraulic Cranes-10tons and Under; Hydro-Axe; Hydro- Blaster; Jacket (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 and Concrete Pumping (regardless of size); Scrapers; Sidebooms; ""straddle"" Carrier, Ross and Similar Types; Vacuum Truck; Whip Hammer; Winch Trucks(Hoisting).

GROUP 3: Asphalt Crubing Machine, Asphalt Plant Engineer, Asphalt Spreader; Autograde Tube Finisher & Texturing Machine (CMI and Similar types) Autograde Curecrete Machine (CMI and Similar Types); Bar Bending Machine (power), Batchers, Batching Plant and Crusher on Site; Belt Conveyor System; Boom Type Skimmer Machines; Bridge Deck Finisher; Bulldozers (all); Car Dumpers (Railroad); Chief of Party; Compressor and Blower Type Units (used) Independently or Mounted On Dual Purpose Trucks, On Job Site or In Conduction with Job Site, In Loading and Unloading of Concrete, Cement, Fly Ash, Instantcrete, or Similar Type Materials); Compressor 92 or 3 in Battery); Concrete Finishing Machines; Concrete Saws and Cutters (ride on type); Concrete Spreaders, Hetzel, Rexomatic and Similar types; Concrete Vibrators; Conveyors, Under 125 ft), Crushing Machines, Ditching Machine, Small (ditchwitch, Vermeer or Similar type); Dope Dots (mechanical with or without pump), dumpsters; Elevator; Fireman; Forklifts (economobile, lull, and similar types of equipment); Front End Loaders (1 yd. and over but less than 2 yds.); Generators (2 or 3 in Battery/ within 100 ft); Giraffe Grinders, Graders and Motor Patrols; Grout Pump; Gunnite Machines (excluding nozzle); Hammer Vibratory (in conjunction with generators); Hoists (Roof, Tuggeaerial Platform Hoist and House Cars), Hoppers, Hoppers Doors (power operated); Hydro-Blaster (where required); Ladders (Motorized); Laddervator; Locomotive, Dinky type; Maintenance, Utility Man; Mechanics; Mixers (Excepting Paving Mixers); Motor Patrols and Graders; Pavement Breakers, Small, Self-Propelled ride on type (also Maintains Compressor or Hydraulic Unit); Pavement Breaker, Truck Mounted; Pipe Bending Machine (power); Pitch Pump; Plaster Pump (regardless of size); Post Hold Digger (post pounder and auger); Rod Bending Machines (power); Roller, Black Top; Scales, (power); Seaman Pulverizing Mixer; Shoulder Widener; Silos; Skimmer Machines (Boom Type);

Steel Cutting Machine, Services and Maintains; Tamrock Drill; Tractors; Tug Captain; Vibrating Plants (used in conjunction with unloading); welder and Repair Mechanics; Concrete cleaning/decontamination machine operator; Directional boring machine; Heavy equipment robotics operator; Master environmental maintenance operator, Ultra high pressure waterjet cutting tool system operator; Vacuum blasting machine operator

GROUP 4: Brooms and Sweepers; Chippers; Compressors (single); Concrete Spreaders (small type); Conveyor Loaders (not including Elevator Graders); Engines, Large Diesel (1620 h.p.) and Staging Pump; Farm Tractors; Fertilizing Equipment (Operator and Maintenance of); Fine Grade Machine (small type); Form Line Graders (small type); Front End Loader (under 1 yd); Generator (single); Grease, Gas, Fuel and Oil Supply Trucks; Heaters (Nelson or Other Type Including Propane, Natural Gas or Flowtype Units); Lights, Portable Generating Light Plants; Mixers, Concrete Small; Mulching Equipment (Operation and Maintenance of); Pumps (2 of Less Than 4 Inch Suction); Pumps 94 Inch Suction and Over Including Submersible Pumps); Pumps (Diesel Engine and Hydraulic); Immaterial of Power; Road Finishing Machines (Small Type); Rollers, Grade, Fill Or Stone Base; Seeding Equipment (Operation and maintenance of); Sprinkler and Water Pump Trucks (Used on job Site or in conduction with Job Site); Steam Jennies and Boilers, Irrespective of Use; Stone Spreader; Tamping Machines, Vibrating Ride On; Temporary Heating Plant (welson or Other Type, Including Propane, Natural Gas or Flow Type Units); Water and Sprinkler Trucks (Used On Job Site In Conduction with Job Site); Welding Machines-Within 100 ft (Gas, and /or Electric Converters of Any type, single, two or three in a battery). welding system, multiple (rectifier transformer type) well point systems (including installation by bull gang and maintenance of); Off Road back dumps.

GROUP 5: Oiler, tire repair

GROUP 6: Helicopter pilots

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ENGI0825-013 01/01/2018

	Rates	Fringes
Power equipment operators:		
BUILDING CONSTRUCTION		
STEEL ERECTION		
GROUP 1.....	\$ 59.09	30.30
GROUP 2.....	\$ 57.43	30.30
GROUP 3.....	\$ 50.14	30.30
GROUP 4.....	\$ 47.48	30.30
GROUP 5.....	\$ 45.95	30.30
GROUP 6.....	\$ 44.19	30.30
GROUP 7.....	\$ 53.70	30.30
BUILDING CONSTRUCTION TANK ERECTION		
GROUP 1.....	\$ 58.81	30.30
GROUP 2.....	\$ 57.22	30.30
GROUP 3.....	\$ 53.70	30.30
GROUP 4.....	\$ 50.13	30.30
GROUP 5.....	\$ 44.92	30.30
OILOSTATIC MAINLINES AND TRANSPORTATION PIPE LINES		
GROUP 1.....	\$ 51.20	30.30
GROUP 2.....	\$ 49.55	30.30
GROUP 3.....	\$ 47.41	30.30
GROUP 4.....	\$ 45.91	30.30
GROUP 5.....	\$ 44.19	30.30
GROUP 6.....	\$ 53.13	30.30
RESIDENTIAL CONSTRUCTION		



ALL JOB CLASSIFICATION.....\$ 11.49

7.75

## NOTES:

Hydrographic Premium	.50
Hazmat Premium	20 percent
Tunnel Premium	.75

## FOOTNOTE:

a. PAID HOLIDAYS: New Years Day, Independence Day, Memorial Day, Labor Day Thanksgiving Day, Christmas Day, Washington's Birthday, November Election Day, Veterans Day, Decoration Day provided the employee works one day in the calendar week during which the holiday occurs

## POWER EQUIPMENT OPERATORS: STEEL ERECTION CLASSIFICATIONS

GROUP 1: Cranes (All Cranes, Land or Floating with Booms Including Jib 140 ft and over, Above Ground); Derricks, Land, Floating or Chicago Boom Type with Booms including Jib 140 ft and over above ground).

GROUP 2: Cranes (All Cranes, Land or Floating with Booms Including Jib Less Than 140 ft Above Ground); Derricks, Land, Floating or Chicago Boom Type with Booms Including Jib Less Than 140 ft above Ground).

GROUP 3: "A" Frame, Cherry Pickers 10 tons and under, Hoists Shall Also Include Steam, Gas, Desel, Electric, Air Hydraulic, Single and Double Drum Concrete, Brick Shaft Caisson, 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.

GROUP 4: Aerial Platform used as Hoist; Compressor: 2 or 3 in Battery; Elevators or House Cars; Conveyors and Tugger Hosits; Chief of Party; Fireman; Forklift; Generators (2 or 3); Maintenance (Utility Man); Rod Bending Machine (power); Welding Machines (Gas or Electric, 2 or 3 in Battery, Including Diesels); Captain: Power Boats: Tug Master: Power Boats.

GROUP 5: Compressor, Single; Welding Machine, Single, Gas, Diesel, and Electric Converters of any Type: Welding System Multiple (Rectifier Transformer Type); Generator, Single.

GROUP 6: Oiler, staddle carrier

GROUP 7: Helicopter Pilot

## For BUILDING CONSTRUCTION TANK ERECTION

## NOTES:

Tunnel Premium	.75
Hazmat Premium	20 %
Hydrographic Premium	.50

## FOOTNOTE:

a. PAID HOLIDAYS: New Years Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, Christmas Day, Washington's Birthday, November Election Day, Veterans Day, Decoration Day provided the employee works one day in the calendar week during which the holiday occurs

## POWER EQUIPMENT OPERATORS: TANK ERECTION CLASSIFICATIONS

GROUP 1: Operating Engineers on all Cranes, Derricks, etc with Booms Including Jib 140 ft or More Above Ground.

GROUP 2: Operating Engineer on all Equipment, Including Cranes, Derricks, etc with Booms Including Jib, Less Than 140 ft above the ground.

#### GROUP 3: Helicopter Pilot

GROUP 4: Air Compressors, Welding Machines and Generators are Covered and are Defined as Cover: Gas, Diesel, or Electric Driven Equipment and Sources of Power from a Permanent Plant: ie: Steam, Compressed Air, Hydraulic or Other Power, For The Operating of any Machine or Automatic Tools, Used In The Erection, Alteration, Repair and Dismantling of Tanks and Any and All "Dual Purpose" Trucks Used On The Construction Job Site, or in the Loading and Unloading of Materials, at the Construction Job Site or in Conjunction with the Job Site.

#### GROUP 5: Oiler

For OILOSTATIC MAINLINES AND TRANSPORTATION PIPE LINES NOTES:

Hydrographic Premium	.50
Hazmat Premium	20%
Tunnel Premium	.75

#### FOOTNOTE:

a. PAID HOLIDAYS: New Years Day, Independence Day, Memorial Day, Labor Day, Thanksgivings Day, Christmas Day, Washington's Birthday, November Election Day, Veterans Day and Decoration Day provided the employee works one day in calendar week during which the holiday occurs.

#### OILSTATIC MAINLINES AND TRANSPORTATION PIPE LINES CLASSIFICATIONS

GROUP 1: Backhoe; Cranes (all types); Draglines, Front End Loaders (5yds. and over), Gradalls, Helicopters (co-pilot), Helicopters (Communication Engineer); Scooper (Loader and Shovel) Koehring; Trench Machines.

GROUP 2: "A" Frame; Backhoe (Combination Hoe Loader); Boring and Drilling Machines; Ditching Machines, Small, Ditchwitch, Vermeer or Similar type; Forklifts; Front End Loaders 92 yds. and over but less than 5 yds.); Graders, Finish (fine); Hydraulic Cranes 10 tons and under (over 10 tons) Cranes Rate Applies); Side Booms: Winch Trucks (Hoisting).

GROUP 3: Backfiller; Brooms and Sweepers; Bulldozers; Compressor (2 or 3 in battery); Chief of Party; Front End Loaders (under 2 yds); Generators; Giraffe Grinders; Graders and Motor Patrols; Machanic; Pipe Bending Machine (power); Tractors; Water and Sprinkler Trucks used on Job Site or in Conduction with Job Site); Welder and Repair Mechanic; Captain (power boats); Tug Master (power boats).

GROUP 4: Compressor (single); Dope Pots (Mechanical with or without Pump); Dust Collectors; Pumps (4 inch suction and over); Pumps (2 of less than 4 inch suction); Pumps, Diesel Engine and Hydraulic (immaterial of power); Welding Machines, Gas or Electric Converters of any type- 2 or 3 in Battery Multiple Welders; Well Point Systems (including installation and Maintenance); Farm Tractors.

GROUP 5: Oiler, grease, gas, fuel and oil supply trucks; Tire repair and maintenance

#### GROUP 6: Helicopter Pilot

\* IRON0417-001 07/01/2020

	Rates	Fringes
IRONWORKER.....	\$ 40.48	46.45+a

a) Paid Holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Day after Thanksgiving (unpaid), Christmas Day.

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LAB00754-001 04/01/2018

	Rates	Fringes
LABORER		
BUILDING & RESIDENTIAL CONSTRUCTION		
Hazardous Waste Handler.....	\$ 39.05	21.95+a
BUILDING & RESIDENTIAL CONSTRUCTION		
Air track operators, joy drill operators.....	\$ 37.90	21.95+a
All types of landscaping, pit men, dump men, building laborers (clean up), Flag Persons.....	\$ 33.80	21.95+a
Blasters.....	\$ 37.05	21.95+a
Bull float man, stud or riveting gunman, all scalars, power buggy operators (all types), mixer men, (by machine or hand), power saw (all types), brush king, jackhammer, jib rig operators, pavement breakers, vibrator men, powder men, ramset operators, torchmen, cement spray men, gunite nozzle men, sandblasting, all other machine or semi-skilled and asbestos and hazardous waste removal;...	\$ 37.05	21.95+a
Form setter, liners, joint setters, top concrete men.....	\$ 37.35	21.95+a
Hod carriers, scaffold and runway men, steel rod carrriers, rip rap and dry stone layers, concrete laborer, mason tenders, piplayers, (all types), signal men, rail and fence men (all types), core drillers, wrecking and demolition men;.....	\$ 36.81	21.95+a
HEAVY & HIGHWAY CONSTRUCTION		
Hazardous Waste Handler		
Category A:.....	\$ 41.50	23.30+a
Category B:.....	\$ 41.50	23.30+a
Category C:.....	\$ 41.50	23.30+a
Category D:.....	\$ 41.50	23.30+a
HEAVY & HIGHWAY CONSTRUCTION		
GROUP 1.....	\$ 45.00	23.30+a

GROUP 2.....	\$ 41.50	23.30+a
GROUP 3.....	\$ 39.75	23.30+a
GROUP 4.....	\$ 36.20	23.30+a

## FOOTNOTE:

a. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving day; Christmas Day, President's Election Day; Non-Presidential Election day; and Veterans Day, provided the employee works two days or reported to work two days in the work week and was unable to work.

## For HEAVY &amp; HIGHWAY CONSTRUCTION

## FOOTNOTE:

a. PAID HOLIDAYS: New Years Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, Christmas Day, President's Birthday, Presidential Election Day, Veterans Day provided the employee works one day in the calendar week during which the holiday occurs.

## LABORERS HEAVY/HIGHWAY CLASSIFICATIONS

## GROUP 1: Blasters

## GROUP 2: Track Operator; Joy Drill Operator

GROUP 3: Nipper, Power Buggy Operator; Plaster Tender; Mixer Man (by Machine or hand); Scaffold Runway Man; Power Saw; Brush King; Steel Rod Carrier; Jack Hammer; Wagon Driller; Jib Rig Operator; Pavement Breaker; Vibrator Man; Bit Grinder; Powder Man; Ramset Operator; Rip Rap and Dry Stone Layer; Cement Spray Man; Gunnite Nozzle Man; Spray and Nozzle Man on Mulching and Seeding Machine; Sand Blaster; Concrete Saw; All other Machine or Semi-Skilled Men; Asbestos and Hazardous Waste Removal; Concrete Laborer; Building Laborer; Mason Tender; Carpenter Tender; Pipe Layer (all types); Signal Man; Gabion Basket Assembler; Bull Float Man; Form Setter; Liner; Joint Setter; Sheeter; Tip Concrete Man; Stud or Riveting Gun Man; All Scalers; Asphalt Men (all types); Rail and Fence (all types); Core Driller; Wrecking and Demolition Man; Bar Man; Seeder; Planter; Landscape Men (all types), Ax Man; Pit and Dump Men; Road Laborer

## GROUP 4: Flag Person

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PAIN0009-010 05/01/2019

	Rates	Fringes
GLAZIER.....	\$ 46.05	43.37

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PAIN0155-004 05/01/2018

	Rates	Fringes
Painters:		
Drywall Finisher.....	\$ 36.19	22.76
Lead Abatement Work.....	\$ 36.19	22.76
Painter/Paperhanger.....	\$ 36.19	22.76
Spray Rate.....	\$ 37.19	22.76

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PAIN0806-001 10/01/2018

	Rates	Fringes
Painters:		
Structural Steel and Bridge.	\$ 49.50	41.88

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PLUM0373-001 05/01/2019

	Rates	Fringes
PLUMBER		
PLUMBERS AND STEAMFITTERS...	\$ 46.92	39.72
REFRIGERATION.....	\$ 32.49	23.87
SINGLE FAMILY DWELLINGS.....	\$ 16.60	4.95

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SFNY0669-002 01/02/2020

	Rates	Fringes
SPRINKLER FITTER.....	\$ 45.52	25.95

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SHEE0038-001 07/01/2020

	Rates	Fringes
Sheet metal worker.....	\$ 46.92	42.55

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TEAM0445-001 05/01/2019

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 33.25	35.55+a
GROUP 1A.....	\$ 34.39	35.55+a
GROUP 2.....	\$ 32.69	35.55+a
GROUP 3.....	\$ 32.47	35.55+a
GROUP 4.....	\$ 32.36	35.55+a
GROUP 5.....	\$ 32.24	35.55+a

## FOOTNOTE:

a. PAID HOLIDAYS: New Year's Day, Labor Day, President's Day, Presidential Election Day, Veterans Day, Decoration Day, Independence Day, Thanksgiving Day and Christmas Day provided the employee works two days in any calendar week during which the holidays occurs.

## TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Drivers on Letourneau tractors, double barrel euclids, Athey wagons and similar equipment (except when hooked to scrapers), I-beam and pole trailers, drivers of road oil distributors, tire trucks and tractors and trailers with 5 axles and over, Articulated Back Dumps and Articulated Water Trucks.

GROUP 1A: Drivers on detachable Gooseneck Low bed Trailers rated over 35 tons.

GROUP 2: Drivers on all equipment 25 yards and over, up to and including 30 yard bodies and cable dump trailers and powder and dynamite trucks.

GROUP 3: Drivers on 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.

GROUP 4: Drivers on tri axles, ten-wheelers, grease trucks and tillermen.

GROUP 5: Drivers on pick-up trucks used for materials & parts, drivers on escort man over-the-road and drivers on straight trucks.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates

the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material,

etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"





## **Exhibit C**





# **Program Requirements and Bid Packet for Contracts Funded with the NYS Clean Water State Revolving Fund or Drinking Water State Revolving Fund**

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**Recipient to Identify Contract Type:**

- ☐ **Construction**
    - ☐ **Treatment Works**
    - ☐ **Non-Treatment Works**
  
  - ☐ **Non-Construction**
- 

Effective October 1, 2020

**New York State Environmental Facilities Corporation**  
625 Broadway, Albany, NY 12207-2997  
P: (518) 402-6924 F: (518) 402-7456  
[www.efc.ny.gov](http://www.efc.ny.gov)

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# PART 1: HOW TO USE THIS DOCUMENT

The New York State Environmental Facilities Corporation (“EFC”) implements the New York State Revolving Fund (“SRF”) for both Clean Water and Drinking Water projects.

This Program Requirements and Bid Packet for Contracts document contains (1) a brief description of New York State and federal program requirements for Contracts and Subcontracts funded in whole or part by the New York State Clean Water and Drinking Water SRFs, (2) required language for such Contracts and Subcontracts to satisfy the SRF program requirements, including required forms, and (3) guidance materials to assist entities in complying with these requirements.

## PROGRAM REQUIREMENTS

The following requirements apply projects funded with the NYS Clean Water State Revolving Fund or Drinking Water State Revolving Fund:

- Participation of Minority- and Women-Owned Business Enterprises (“MWBE”) and Equal Employment Opportunities (“EEO”) pursuant to New York State Executive Law, Article 15-A and New York Code of Rules and Regulations, Title 5 (5 NYCRR) Parts 140-145 (Regulations of the Commissioner of Economic Development);
- Equal Employment Opportunities pursuant to Titles VI and VII of the Civil Rights Act of 1964, 40 CFR Part 7, and 41 CFR Part 60-1 Subpart A;
- Affirmative Action requirements pursuant to 41 CFR Part 60-4;
- Non-discrimination requirements pursuant to Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972;
- Encouragement of participation of Service-Disabled Veteran-Owned Business Enterprises (“SDVOB”) in accordance with New York State Executive Law, Article 17-B and 9 NYCRR Part 252;
- American Iron and Steel (“AIS”) pursuant to P.L. 113-76, Consolidated Appropriates Act, 2014; WRRDA Section 608 of the Federal Water Pollution Control Act, as revised;
- Davis Bacon Related Acts (“DBRA”) consisting of the following: The Davis Bacon Act; Copeland Act (40 U.S.C. § 3145); Reorganization Plan No. 14; Department of Labor 29 CFR Parts 1, 3, and 5; Contract Work Hours and Safety Standards Act;
- Applicable State and/or local prevailing wage requirements;
- Requirements regarding suspension and debarment pursuant to 2 CFR Part 180, 2 CFR Part 1532, 29 CFR § 5.12, Executive Order 11246, State Labor Law § 220-b, and State Executive Law § 316; and,
- Restrictions on Lobbying pursuant to 40 CFR Part 34.

EFC or its authorized representatives, and other governmental entities as applicable, reserve the right to conduct occasional site inspections to monitor compliance with SRF program requirements.

**This document is not intended to be inclusive of all applicable legal requirements and there may be other legal requirements that need to be included in a particular Contract or Subcontract that are not set forth here. Accordingly, EFC recommends that Recipients, Contractors, Subcontractors, and any other involved entities consult their legal counsel for advice on compliance with all applicable laws, including but not limited to local laws. This document is not intended to be legal advice.**

Refer to the EFC website at [www.efc.ny.gov](http://www.efc.ny.gov) for the latest version of the bid packet to ensure that the most recent forms and contract language are being used.

## **REQUIRED CONTRACT LANGUAGE**

Part 2 of this document is the Required Contract Language. All of the language in Part 2 must be inserted into all Contracts and Subcontracts funded in whole or in part with SRF funds, in order for SRF Recipients, Contractors, and Subcontractors to comply with the above-listed SRF program requirements.

## **GUIDANCE MATERIALS**

Part 3 of this document sets forth Guidance Materials intended to assist SRF Recipients, Contractors, and Subcontractors in complying with the foregoing SRF program requirements, as applicable.

**The Guidance Materials are for informational purposes only and are not intended to be used as contractual language. Please do not incorporate the Guidance Materials into any Contracts or Subcontracts.**

## **COMMONLY USED TERMS**

The following commonly used terms are defined herein as follows:

**“Contract”** means an agreement between a Recipient and a Contractor.

**“Contractor”** means all bidders, prime contractors, Service Providers, and consultants as hereinafter defined, unless specifically referred to otherwise.

**“Service Provider”** means any individual or business enterprise that provides one or more of the following: legal, engineering, financial advisory, technical, or other professional services, supplies, commodities, equipment, materials, or travel.

**“Subcontract”** means an agreement between a Contractor and a Subcontractor.

**“Subcontractor”** means any individual or business enterprise that has an agreement, purchase order, or any other contractual arrangement with a Contractor.

**“Recipient”** means the party, other than EFC, to a grant agreement or a project finance agreement with EFC through which funds for the payment of amounts due thereunder are being paid in whole or in part.

**“State”** means the State of New York.

**“Treatment Works”** is defined in Clean Water Act (CWA) Section 212.

**“Nonpoint Source Projects”** and **“Green Infrastructure Projects”** are defined in CWA Section 319.

**“Estuary Management Program Project”** is defined in CWA Section 320.



# PART 2: REQUIRED CONTRACT LANGUAGE

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## Recipient to Identify Contract Type:

- ☐ **Construction**
  - ☐ **Treatment Works**
  - ☐ **Non-Treatment Works**

- ☐ **Non-Construction**
- 

## SECTION 1 REQUIREMENTS AND PROCEDURES FOR BUSINESS PARTICIPATION OPPORTUNITIES FOR NEW YORK STATE CERTIFIED MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

For purposes of this section:

**“Non-Construction”** shall mean Contracts for labor, services (including, but not limited to, legal, financial, and other professional services), supplies, equipment, materials, or any combination of the foregoing.

**“Contracts Meeting Article 15-A Thresholds”** shall mean Contracts or Subcontracts meeting the thresholds under New York State Executive Law Article 15-A as follows:

- (a) Non-Construction Contracts greater than \$25,000;
- (b) Non-Construction Contracts, that are initially under \$25,000 but subsequent change orders or contract amendments increase the Contract value to above \$25,000;
- (c) Construction Contracts greater than \$100,000; and,
- (d) Construction Contracts that are initially under \$100,000 but subsequent change orders or contract amendments increase the Contract value to above \$100,000.

The Equal Employment Opportunities requirements of this section apply to all Contracts and Subcontracts, with the exception of:

- (1) the requirements under Title VII of the Civil Rights Act of 1964 and 41 CFR Part 60-1 Subpart A which apply only to construction Contracts and Subcontracts;
- (2) the Federal Affirmative Action Regulations requirements which apply only to construction Contracts and Subcontracts greater than \$10,000.

The Minority- and Women- Owned Business Enterprises (“MWBE”) participation requirements of this section apply to the Contracts Meeting Article 15-A Thresholds.

Disregard this section if it does not apply to this Contract or Subcontract.

## **I. General Provisions**

- A. Contractors and Subcontractors are required to comply with the following provisions:
1. New York State Executive Law Article 15-A and 5 NYCRR Parts 140-145 ("MWBE Regulations") for all State Contracts as defined therein, with a value (1) in excess of \$25,000 for labor, services (including, but not limited to, legal, financial, and other professional services), supplies, equipment, materials, or any combination of the foregoing, or (2) in excess of \$100,000 for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon.
  2. Title VI of the Civil Rights Act of 1964 and 40 CFR Part 7 ("Title VI") for any program or activity receiving federal financial assistance, as those terms are defined therein.
  3. Title VII of the Civil Rights Act of 1964 and 41 CFR Part 60-1 Subpart A ("Title VII") for construction Contracts related to any government programs providing federal financial assistance, as those terms are defined therein.
  4. 41 CFR Part 60-4 ("Federal Affirmative Action Regulations") for federal or federally assisted construction Contracts in excess of \$10,000, as those terms are defined therein.
  5. Section 504 of the Rehabilitation Act of 1973 ("Section 504") for any program or activity receiving federal financial assistance, as those terms are defined therein.
  6. The Age Discrimination Act of 1975 ("Age Discrimination Act") for any program or activity receiving federal financial assistance, as those terms are defined therein.
  7. Section 13 of the Federal Water Pollution Control Act ("Clean Water Act") Amendments of 1972 ("Section 13") for any program or activity receiving federal financial assistance under the Clean Water Act, as those terms are defined therein.
- B. Failure to comply with all of the requirements herein may result in a finding by the Recipient that the Contractor is non-responsive, non-responsible, and/or has breached the Contract, leading to the withholding of funds or such other actions, liquidated damages pursuant to subsection III(F) of this section, or enforcement proceedings as allowed by the Contract.
- C. If any terms or provisions herein conflict with Executive Law Article 15-A, the MWBE Regulations, Title VI, Title VII, or Federal Affirmative Action Regulations, such law and regulations shall supersede these requirements.
- D. Upon request from the Recipient's Minority Business Officer ("MBO") and/or EFC, Contractor will provide complete responses to inquiries and all MWBE and EEO records available within a reasonable time. For purposes of this section, MBO means the duly authorized representative of the SRF Recipient for MWBE and EEO purposes.

## **II. Equal Employment Opportunities (EEO)**

*Applicable to all Contracts and Subcontracts unless otherwise noted*

- A. 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.
- B. The Contractor shall comply with the provisions of the Human Rights Law (Executive Law Article 15), Title VI, Title VII, the Federal Affirmative Action Regulations, Section 504, Age Discrimination Act, Section 13, and all other State and Federal statutory and constitutional non-discrimination provisions. The Contractor and Subcontractors 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.

- C. Contractors and Subcontractors shall have instituted grievance procedures to assure the prompt and fair resolution of complaints when a violation of Title VI of the Civil Rights Act of 1964 or Title 40 CFR Part 7 is alleged.
- D. Pursuant to 40 CFR § 7.95, the Contractor shall display a copy of the EEO notice at the project site in a visible location. The notice shall accommodate individuals with impaired vision or hearing and should be provided in languages other than English where appropriate. The notice must also identify the employee responsible for its EEO compliance. A copy of the EEO notice ("EEO Poster") can be found at:  
<https://www.dol.gov/ofccp/regs/compliance/posters/pdf/eeopost.pdf> .

The Contractor will include the provisions of Subdivisions II(A) and II(C) in every Subcontract in such a manner that the requirements of these subdivisions will be binding upon each Subcontractor as to work in connection with the Contract.

*Applicable to all construction Contracts*

- E. The Contractor and Subcontractor will comply with the requirements of 41 CFR § 60-1.4(b) and (c), and such provisions are hereby incorporated by reference. These provisions require, in part, that the Contractor and Subcontractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor and Subcontractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

*Applicable to construction Contracts greater than \$10,000*

- F. The Contractor and Subcontractor will comply with the Affirmative Action Regulations and such provisions are hereby incorporated by reference. These provisions require, in part, that the Contractor and Subcontractor place affirmative action goals on Contracts and Subcontracts, as established by the United States Department of Labor. Affirmative action goals for minorities and women by geographic region can be found here:  
<https://www.dol.gov/sites/dolgov/files/ofccp/ParticipationGoals.pdf> .

*G. Required EEO Forms*

Pursuant to 41 CFR Section 60-1.7 for federally assisted construction Contracts, Contractor and Subcontractor will annually file an EEO-1 Report with the Joint Reporting Committee for the Office of Federal Contract Compliance Programs (OFCCP) and the Equal Employment Opportunity Commission (EEOC) according to the instructions provided at <https://www.eeoc.gov/employers/eo-1-survey/eo-1-instruction-booklet> , if Contractor or Subcontractor:

1. Is not exempt from compliance pursuant to 41 CFR § 60-1.5;
2. Has 50 or more employees;
3. Is a prime Contractor or first tier Subcontractor; or Subcontractor below the first tier which performs construction work at the site of construction; and
4. Has a Contract, Subcontract, or purchase order amounting to \$50,000 or more.

### III. Business Participation Opportunities for MWBEs

*Applicable to Contracts Meeting Article 15-A Thresholds*

#### A. Contract Goals

1. For purposes of this Contract, EFC establishes the following goals for New York State certified MWBE participation based on the current availability of qualified MBEs and WBEs.

Program	MWBE Contract Goal*
CWSRF, DWSRF, & Green Innovation Grant Program	20%
NYS Water Infrastructure Improvement Act Grants (also receiving EFC loan)	Clean Water project 23% Drinking Water project 26%
NYS Intermunicipal Grants (also receiving EFC loan)	Clean Water project 24% Drinking Water project 24%

\*May be any combination of MBE and/or WBE participation

2. For purposes of providing meaningful participation by MWBEs on the Contract and achieving the MWBE Contract Goals established in Section III-A hereof, the Contractor should reference the directory of New York State Certified MWBEs found at the following internet address: <https://ny.newnycontracts.com>.
3. 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 achievement of applicable MWBE participation goals.
  - a. For construction and construction-related services Contracts or Subcontracts, the portion of the Contract or Subcontract with an MWBE serving as a supplier, and so designated in ESD's Directory, that shall be deemed to represent the commercially useful function performed by the MWBE shall be 60% of the total value of the Contract or Subcontract. The portion of a Contract or Subcontract with an MWBE serving as a broker, as denoted by NAICS code 425120, 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.
  - b. For non-construction Contracts or Subcontracts, the portion of a Contract or Subcontract with an MWBE serving as a broker that shall be deemed to represent the commercially useful function performed by the MWBE shall be 25% of the total value of the contract
4. Where MWBE Contract Goals have been established herein, pursuant to 5 NYCRR § 142.8, the Contractor must document "good faith efforts" to provide meaningful participation by MWBEs as Subcontractors or suppliers in the performance of the Contract.
5. In accordance with Section 316-a of Article 15-A and 5 NYCRR § 142.13, the Contractor acknowledges that if it is found to have willfully and intentionally failed to comply with the MWBE participation goals set forth in the Contract, such a finding constitutes a breach of Contract and the Contractor shall be liable to the Recipient for liquidated or other appropriate damages, as set forth herein.

#### B. MWBE Utilization Plan

1. The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan to the Recipient prior to the execution of this Contract.
2. The Contractor agrees to use such MWBE Utilization Plan for the performance of MWBEs on the Contract pursuant to the prescribed MWBE goals set forth in Section III-A of this section.

3. The Contractor further agrees that a failure to submit and/or use such MWBE Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, the Recipient shall be entitled to any remedy provided herein, including but not limited to, a finding that the Contractor is not responsive.
4. Contractor must report any changes to the Utilization Plan after Contract award and during the term of the Contract to the Recipient's MBO. Contractor shall indicate the changes to the MBO in the next Monthly MWBE Contractor Compliance Report after the changes occurred. At EFC's discretion, an updated MWBE Utilization Plan form and good faith effort documentation may be required to be submitted. When a Utilization Plan is revised due to execution of a change order, the change order should be submitted to the MBO with the Monthly MWBE Contractor Compliance Report or revised Utilization Plan.
5. The Contractor shall submit copies of all fully executed Subcontracts, agreements, and purchase orders that are referred to in the MWBE Utilization Plan to the MBO within 30 days of their execution.

#### C. Requests for Waiver

1. If the Contractor, after making good faith efforts, is unable to comply with MWBE goals, the Contractor may submit a Request for Waiver to the Recipient documenting good faith efforts by the Contractor to meet such goals. If the documentation included with the waiver request is complete, the Recipient shall forward the request to EFC for evaluation, and EFC will issue a written notice of acceptance or denial within twenty (20) days of receipt.
2. If the Recipient, upon review of the MWBE Utilization Plan and updated Quarterly MWBE Contractor Compliance Reports 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 Recipient 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.

#### D. Monthly MWBE Contractor Compliance Report ("Monthly MWBE Report")

The Contractor agrees to submit a report to the Recipient by the third business day following the end of each month over the term of this Contract documenting the payments made and the progress towards achievement of the MWBE goals of the Contract. The Monthly MWBE Report must be supplemented with proof of payment by the Contractor to its Subcontractors (e.g., copies of both sides of a cancelled check) and proof that Subcontractors have been paid within 30 days of receipt of payment from the Recipient. The final Monthly MWBE Report must reflect all Utilization Plan revisions and change orders.

#### E. Liquidated Damages - MWBE Participation

In accordance with Section 316-a of Article 15-A and 5 NYCRR §142.13, if it has been determined by the Recipient or EFC that the Contractor has willfully and intentionally failed to comply with the MWBE participation goals, the Contractor shall be obligated to pay to Recipient liquidated damages or other appropriate damages, as specified herein and as determined by the Recipient or EFC.

Liquidated damages shall be calculated as an amount not to exceed the difference between:

1. All sums identified for payment to MWBEs had the Contractor achieved the approved MWBE participation goals; and,
2. All sums actually paid to MWBEs for work performed or materials supplied under this Contract.

The Recipient and EFC reserve the right to impose a lesser amount of liquidated damages than the amount calculated above based on the circumstances surrounding the Contractor's non-compliance.

In the event a determination has been made by the Recipient or EFC which requires the payment of damages identified herein and such identified sums have not been withheld, Contractor shall pay such damages to the Recipient within sixty (60) days after they are assessed unless prior to the expiration of such sixtieth day, the Contractor has filed a complaint with the Empire State Development Corporation – Division of Minority and Women’s Business Development (“ESD”) pursuant to Subdivision 8 of Section 313 of the Executive Law in which event the damages shall be payable if the Director of ESD renders a decision in favor of the Recipient.

## **SECTION 2 PARTICIPATION OPPORTUNITIES FOR NEW YORK STATE CERTIFIED SERVICE-DISABLED VETERAN-OWNED BUSINESSES**

New York State Executive Law Article 17-B and 9 NYCRR Part 252 provide for more meaningful participation in public procurement by certified Service-Disabled Veteran-Owned Businesses (“SDVOBs”), thereby further integrating such businesses into New York State’s economy. EFC recognizes the need to promote the employment of service-disabled veterans and to ensure that certified service-disabled veteran-owned businesses have opportunities for maximum feasible participation in the performance of EFC Contracts.

In recognition of the service and sacrifices made by service-disabled veterans and in recognition of their economic activity in doing business in New York State, Contractors are strongly encouraged and expected to consider SDVOBs in the fulfillment of the requirements of the Contract. Such participation may be as Subcontractors or suppliers, as protégés, or in other partnering or supporting roles.

Contractor is encouraged to make good faith efforts to promote and assist in the participation of SDVOBs on the Contract for the provision of services and materials. The directory of New York State Certified SDVOBs can be viewed at: <http://ogs.ny.gov/Core/SDVOBA.asp>.

Contractor is encouraged to contact the Office of General Services’ Division of Service-Disabled Veteran’s Business Development at 518-474-2015 or VeteransDevelopment@ogs.ny.gov to discuss methods of maximizing participation by SDVOBs on the Contract.

## **SECTION 3 AMERICAN IRON AND STEEL (AIS) REQUIREMENT**

*The requirements of this section apply to (1) all construction Contracts and Subcontracts for DWSRF projects and CWSRF treatment works projects and (2) all Contracts for the purchase of iron and steel products for a DWSRF project or CWSRF treatment works project. Disregard this section if it does not apply to this Contract or Subcontract.*

The Contractor acknowledges to and for the benefit of the Recipient of the Clean Water State Revolving Fund (“CWSRF”) or the Drinking Water State Revolving Fund (“DWSRF”) financial assistance that the Contractor understands the goods and services under this Agreement are being funded with monies made available by the New York State Environmental Facilities Corporation (“EFC”) through the CWSRF or the DWSRF and that such funding is subject to certain statutory restrictions requiring that certain iron and steel products used in the project be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement.

The Contractor hereby represents and warrants that:

- (a) the Contractor has reviewed and understands the American Iron and Steel Requirement,
- (b) all of the iron and steel products covered by the American Iron and Steel Requirement used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and
- (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Recipient.

Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Recipient to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Recipient resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the EFC or any damages owed to the EFC by the Recipient). While the Contractor has no direct contractual privity with the EFC, as a lender to the Recipient for the funding of this project, the Recipient and the Contractor agree that the EFC is a third-party beneficiary and neither this paragraph, nor any other provision of this Agreement necessary to give this paragraph force or effect, shall be amended or waived without the prior written consent of the EFC.

## **SECTION 4       DAVIS-BACON (DB) PREVAILING WAGE REQUIREMENTS**

*The requirements of this section apply to all construction Contracts and Subcontracts greater than \$2,000 for either DWSRF projects or CWSRF treatment works projects. Disregard this section if it does not apply to this Contract or Subcontract.*

### **For Contracts in Excess of \$2,000:**

#### **1. Minimum Wages**

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its Subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. The Davis-Bacon poster (WH-1321) can be found at <https://www.dol.gov/whd/regs/compliance/posters/davis.htm> . Wage determinations may be obtained from the US Department of Labor's website, <http://www.beta.sam.gov> .

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the Contract shall be classified in conformance with the wage determination. The contracting officer shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

1. The work to be performed by the classification requested is not performed by a classification in the wage determination;
2. The classification is utilized in the area by the construction industry; and,
3. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.



(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (1) (ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this Contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program *provided* that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding. The Recipient shall upon its own action or upon written request of the EPA Award Official or an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any Subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the Contract, the Recipient may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### 3. Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR § 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B)



of the Davis–Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any Contract work is performed a copy of all payrolls to the Recipient. Such documentation shall be available on request of EFC or EPA. As to each payroll copy received, the Recipient shall provide written confirmation in a form satisfactory to EFC indicating whether or not the project is in compliance with the requirements of 29 CFR § 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR § 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/agencies/whd/government-contracts/construction/forms> or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all Subcontractors. Contractors and Subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Recipient, for transmission to EFC, EPA if requested by EPA, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime Contractor to require a Subcontractor to provide addresses and social security numbers to the prime Contractor for its own records, without weekly submission to the Recipient (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the Contractor or Subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or Subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The Contractor or Subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Recipient, EFC, EPA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or Subcontractor fails to submit the

required records or to make them available, the Recipient, EFC, or EPA may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR § 5.12.

#### 4. Apprentices and trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or Subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR § 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

5. Compliance with Copeland Act Requirements. The Contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this Contract.

6. Subcontracts. The Contractor or Subcontractor shall insert in any Subcontracts the clauses contained in 29 CFR § 5.5(a)(1) through (10) and such other clauses as the Recipient may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier Subcontracts. The prime Contractor shall be responsible for the compliance by any Subcontractor or lower tier subcontractor with all the Contract clauses in 29 CFR § 5.5.

7. Contract Termination: Debarment. A breach of the contract clauses in 29 CFR § 5.5 may be grounds for termination of the Contract, and for debarment as a Contractor and a Subcontractor as provided in 29 CFR § 5.12.

8. Compliance with Davis–Bacon and Related Act requirements. All rulings and interpretations of the Davis–Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this Contract.

9. Disputes Concerning Labor Standards. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its Subcontractors) and the Recipient, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

(i) By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government Contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. § 1001.

***For Contracts in Excess of \$100,000:***

1. Overtime requirements. No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$25 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

3. Withholding for unpaid wages and liquidated damages. The Recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor under any such Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

4. Subcontracts. The Contractor or Subcontractor shall insert in any Subcontracts the clauses set forth in paragraphs (1) through (4) of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier Subcontracts. The prime Contractor shall be responsible for compliance by any Subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. In any Contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR § 5.1, the Contractor or Subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the records to be maintained under this paragraph shall be made available by the Contractor or Subcontractor for inspection, copying, or transcription by authorized representatives of the Recipient and the Department of Labor, and the Contractor or Subcontractor will permit such representatives to interview employees during working hours on the job.

## **SECTION 5            REQUIREMENTS REGARDING SUSPENSION AND DEBARMENT**

*The requirements of this section apply to all Contracts and Subcontracts.*

Contractor and any Subcontractors shall comply with, Subpart C of 2 CFR Part 180 as implemented and supplemented by 2 CFR Part 1532. The Contractor is not a debarred or suspended party under 2 CFR Part 180 or 2 CFR Part 1532, or 29 CFR § 5.12. Neither the Contractor nor any of its Subcontractors have contracted with, or will contract with, any debarred or suspended party under the foregoing regulations.

The Contractor and any Subcontractor have not been debarred from or deemed ineligible for Government Contracts or federally assisted construction Contracts pursuant to Executive Order 11246.

The Contractor and any Subcontractors have not been deemed ineligible to submit a bid on or be awarded a public contract or subcontract pursuant to Article 8 of the State Labor Law, specifically Labor Law § 220-b. In addition, neither the Contractor nor any Subcontractors have contracted with, or will contract with, any party that has been deemed ineligible to submit a bid on or be awarded a public contract or subcontract under Labor Law § 220-b.

In addition, the Contractor and any Subcontractors have not been deemed ineligible to submit a bid and have not contracted with and will not contract with any party that has been deemed ineligible to submit a bid under Executive Law § 316.

## **SECTION 6            RESTRICTIONS ON LOBBYING**

*The requirements of this section apply to all Contracts and Subcontracts greater than \$100,000. Disregard this section if it does not apply to this Contract or Subcontract.*

The Contractor and any Subcontractor executing a Contract or Subcontract in excess of \$100,000 agree to provide to the Recipient an executed Certification Regarding Lobbying pursuant to 40 CFR Part 34 ("Lobbying Certification") in the form attached hereto as Attachment 9, consistent with the prescribed form provided in Appendix A to 40 CFR Part 34.

# PART 3: GUIDANCE MATERIALS

## APPLICABILITY OF PROGRAM REQUIREMENTS

This table contains a breakdown of the applicable program requirements based on contract type and its value. For further details pertaining to each requirement, refer to the section identified in the heading. The relevant section number is the same in both Part 2 and Part 3 of this document.

Type of Contract	MWBE <a href="#">Section 1</a>	EEO <sup>1</sup> <a href="#">Section 1</a>	Title VII <a href="#">Section 1</a>	AIS <a href="#">Section 3</a>	Davis Bacon <a href="#">Section 4</a>	FAAR <sup>2</sup> <a href="#">Section 1</a>	Suspension & Debarment <a href="#">Section 6</a>	Restrictions on Lobbying <a href="#">Section 7</a>
<b>Construction: Treatment Works</b>								
All		X	X	X			X	
If greater than:								
\$2,000		X	X	X	X		X	
\$10,000		X	X	X	X	X	X	
\$100,000	X	X	X	X	X	X	X	X
<b>Construction: Non-Treatment Works</b>								
All		X	X				X	
If greater than:								
\$10,000		X	X			X	X	
\$100,000	X	X	X			X	X	X
<b>Non-Construction</b>								
All		X		X				
If greater than:								
\$25,000	X	X		X				
\$100,000	X	X		X				X

<sup>1</sup> For purposes of this table, "EEO" includes the following: EEO requirements under 40 CFR Part 33, Title VI, Section 504, Age Discrimination Act, and Section 13.

<sup>2</sup> For purposes of this table, "FAAR" means the Federal Affirmative Action Regulations.

# SECTION 1 GUIDANCE FOR THE REQUIREMENTS AND PROCEDURES FOR BUSINESS PARTICIPATION OPPORTUNITIES FOR FEDERAL DISADVANTAGED BUSINESS ENTERPRISES AND NEW YORK STATE CERTIFIED MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

## I. Summary of EEO and MWBE forms

### A. Forms to be Submitted Prior to Contract Execution

*Applicable to Contracts Meeting Article 15-A Thresholds*

#### 1. **MWBE Utilization Plan**

To be submitted by the Contractor to the MBO after the bid opening, but in no case more than ten (10) business days after the Contractor receives notice from the Recipient that the Contractor has submitted a low bid. For Contracts that are not bid, it is to be submitted prior to the Contract execution date. This form is attached hereto as Attachment 4. See Required Contract Language, Section 1(III)(B).

### B. Forms to be Submitted During the Term of the Contract

*Applicable to Contracts Meeting Article 15-A Thresholds*

#### 1. **Request for Partial or Total MWBE Waiver**

If applicable, to be submitted by the Contractor to the MBO at any time during the term of the Contract, but prior to the submission of a request for final payment on the Contract. This form is attached hereto as Attachment 5. See Required Contract Language, Section 1(III)(C).

#### 2. **Monthly MWBE Contractor Compliance Report ("Monthly MWBE Report")**

To be submitted by the Contractor to the MBO by the third business day following the end of each month over the term of the Contract. This form is attached hereto as Attachment 3. See Required Contract Language, Section 1(III)(D).

*Applicable to all construction Contracts*

#### 3. **EEO-1 Report**

To be submitted by the Contractor and Subcontractor, as applicable, annually during the term of the Contract or Subcontract. A sample EEO-1 Report can be found here:

[https://www.eeoc.gov/sites/default/files/migrated\\_files/employers/eeo1survey/eeo1-2-2.pdf](https://www.eeoc.gov/sites/default/files/migrated_files/employers/eeo1survey/eeo1-2-2.pdf)

Instructions for how to submit the EEO-1 Report online can be found here:

<https://www.eeoc.gov/employers/eeo-1-survey/eeo-1-instruction-booklet> . See Section 1(II)(D), Required Contract Language.

## II. Equal Employment Opportunities (EEO)

### A. EEO Poster

*Applicable to all construction Contracts*

Attachment 1, *EEO Poster*, is the notice provided by the United States Department of Labor, with a place added to identify the employee responsible for EEO compliance, as required by 40 CFR § 7.95.

### B. EEO Goals

*Applicable to construction Contracts greater than \$10,000*

Pursuant to 41 CFR Part 60-4, the United States Department of Labor has established EEO goals for the employment of minorities and women. For federal and federally assisted construction Contractors, goals for minorities and females are established as a percentage participation rate. These goals are applicable to all of a Contractor's construction work sites (whether or not these sites are also the result of a federal Contract or are federally assisted). The goals are applicable

to each nonexempt Contractor's total onsite construction workforce, regardless of whether or not part of that workforce is performing work on a federal, federally assisted or non-federally related project Contract or Subcontract. Contractors should apply to each work site the goal for the geographical area that each particular work site is located in. These goals, and further information, are available at: <https://www.dol.gov/sites/dolgov/files/ofccp/ParticipationGoals.pdf>.

### III. Business Participation Opportunities for MWBEs

*Applicable to Contracts Meeting Article 15-A Thresholds*

#### A. Contract Goals

The goals provided herein (Required Contract Language, Section 1(III)(A)) are effective as of October 1, 2020. MWBE participation goals for a contract will be based on the goals in place at the time of the execution date of each respective contract, unless otherwise specified.

Please contact EFC if you have any questions about the applicable MWBE participation goals for your contract.

#### B. Good Faith Efforts

The Contractor must make good faith efforts to develop an adequate MWBE Utilization Plan and must continue such good faith efforts to meet applicable MWBE participation goals. The Contractor shall maintain documentation of good faith efforts to solicit participation of MWBE firms for SRF-funded projects. If a Contractor is unable to meet contract MWBE participation goals, and submits a Request for Waiver, documentation of such good faith efforts must accompany the request. See Required Contract Language, Section 1(III)(C).

Contractor should also continue good faith efforts to seek opportunities for MWBE participation during the life of the contract even if proposed goals have been achieved.

Examples of documentation of good faith efforts are set forth below:

- Information on the scope of work related to the contract, such as a copy of the schedule of values from the bid submission, and specific steps taken to reasonably structure the scope of work to break out tasks or equipment needs for the purpose of providing opportunities for subcontracting with, or obtaining supplies or services from, MBEs or WBEs.
- Printed screenshots of the directory of Certified Minority- and Women- Owned Business Enterprises ("MWBE directory") on ESD's website for certified MWBEs that provide the services or equipment necessary for the contract. Contact the MBO for assistance in performing a proper search including identifying a sufficient number of solicitations to show that good faith effort was made.
- Copies of timely solicitations and documentation (e.g., faxes and emails) that the Contractor offered relevant plans, specifications, or other related materials to MBE and WBE firms on ESD's MWBE directory to participate in the work, with the responses.
- A log prepared by the Contractor in a sortable spreadsheet documenting the Contractor's solicitation of MBEs and WBEs for participation as Subcontractors or suppliers pursuant to a contract. The log should consist of the list of MBE and WBE firms solicited, their contact information, the type of work they were solicited to perform (or equipment to provide), how the solicitation was made (fax, phone, email) and the contact information, the contacts name and the outcome. If a bid was received, the bid price should also be included in the log. See a sample log format below:

Date	M/WBE Type	Company	Scope of work	Contact Name	Phone/ Email	Solicitation Format	MWBE Response	Negotiation Required?	Selected? If not, Explain



If no response was received to an initial solicitation, at least one follow-up solicitation should be made in a different format than the first, e.g. fax followed by phone call. Any winning bids received from non-MWBE firms for the same areas MWBEs were solicited should also be tracked on the log.

- Copies of any advertisements of sufficient duration to effectively seek participation of certified MBE and WBEs timely published in appropriate general circulation, trade and MWBE oriented publications, together with listing and dates of publication of such advertisements. EFC recommends the use of the NYS Contract Reporter that is free to all Contractors - <https://www.nyscr.ny.gov> .
- Documents demonstrating that insufficient MBEs or WBEs are reasonably available to perform the work.
- A written demonstration that the Contractor offered to make up any inability to meet the project MWBE participation goals in other Contracts and/or agreements performed by the Contractor on another SRF funded project.
- The date of pre-bid, pre-award, or other meetings scheduled by the Recipient, if any, and the contact information of any MBEs and WBEs who attended and are capable of performing work on the project.
- Any other information or documentation that demonstrates the Contractor conducted good faith efforts to provide opportunities for MWBE participation in their work. For instance, Prime Contractors and MBOs should develop a list of MWBE firms that have expressed interest in working on SRF-funded projects.

EFC reserves the right to request additional information and/or documentation to support the adequacy of the MWBE Utilization Plan and/or waiver request.

#### C. Review of the MWBE Utilization Plan

The MBO will evaluate a completed MWBE Utilization Plan. If the MBO finds the Utilization Plan sufficient, it will be forwarded to EFC for review. If the MBO finds the Utilization Plan insufficient, the MBO will work with the Contractor to address deficiencies before submitting to EFC for review. A written notice of acceptance or deficiency will be issued by EFC within 20 business days of receipt of the Utilization Plan. Upon receipt of a notice of deficiency from either the MBO or EFC, the Contractor shall respond with a written remedy to such notice within seven (7) business days of receipt.

#### D. Eligibility for MWBE Participation Credit

1. To receive MWBE participation credit, Contractors or Subcontractors performing work that have been identified in an approved MWBE Utilization Plan must be certified as an MBE or WBE by ESD.
  - a. A Contractor, who is a certified MBE or WBE, will be credited for up to 100% of the category of their certification. However, good faith efforts to seek participation in the other category are also required.
2. Prime Contractors may also include second or lower tier Subcontractors (Subcontractors hired by Subcontractors) on their MWBE Utilization Plan.
3. Credit for MWBE participation shall be granted only for MWBE firms performing a commercially useful business function according to custom and practice in the industry. An MWBE does not perform a commercially useful function if its role adds no substantive value and is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of participation.
  - a. "Commercially useful functions" normally include:



- i. Providing technical assistance to a purchaser prior to a purchase, during installation, and after the supplies or equipment are placed in service;
  - ii. Manufacturing or being the first tier below the manufacturer of supplies or equipment;
  - iii. Providing functions other than merely accepting and referring requests for supplies or equipment to another party for direct shipment to a Contractor; or,
  - iv. Being responsible for ordering, negotiating price, and determining quality and quantity of materials and supplies.
- b. For construction Contracts or Subcontracts, the following rules apply when calculating MWBE utilization:
  - i. The portion of a Contract or Subcontract with an MWBE serving as a manufacturer that shall be deemed to represent the commercially useful function performed by the MWBE shall be 100% of the total value of the Contract or Subcontract.
  - ii. the portion of a Contract or Subcontract with an MWBE serving as a supplier (as denoted by a NAICS code beginning with 423 or 424, or a NIGP code that does not begin with the number 9), and so designated in ESD's Directory, that shall be deemed to represent the commercially useful function performed by the MWBE shall be 60% of the total value of the Contract or Subcontract.
  - iii. the portion of a Contract or Subcontract with an MWBE serving as a broker (as denoted by NAICS code 425120) 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. For non-construction Contracts or Subcontracts, the following rules apply when calculating MWBE utilization:
  - i. the portion of a Contract or Subcontract with an MWBE serving as a broker that shall be deemed to represent the commercially useful function performed by the MWBE shall be 25% of the total value of the contract. Any firms that are listed as brokers or manufacturers' representatives (NAICS code 425120) and not specifically as suppliers fall in this category.
- d. No credit will be granted for MWBEs that do not perform a commercially useful function.

#### E. Requests for Waiver

1. If the Contractor's application of good faith efforts does not result in the utilization of MWBE firms to achieve the aforementioned goals or a specialty equipment/service waiver is requested, the Contractor may request a full or partial waiver of MWBE participation goals by completing a Request for Waiver form, attaching appropriate documentation of good faith efforts, and submitting same to the MBO. See also Required Contract Language, Section 1(III)(C). Even if an MWBE waiver is granted, EEO information must still be submitted.
2. The MBO and EFC will review each waiver request based on the good faith effort criteria presented above and the documentation submitted with the waiver request. EFC will not issue any automatic waivers from MWBE responsibilities.
3. Specialty Equipment/Service Exclusion: A specialty equipment/service exclusion may be granted in cases where:
  - a. equipment is made by only one non-MWBE manufacturer,
  - b. the technical specifications call for equipment that is not available through an MWBE supplier;
  - c. the equipment is constructed on site by specially trained non-MWBE labor;
  - d. the service is not available through an MWBE (such as work done by National Grid);
  - e. the service is proprietary in nature (such as use of certain computer software necessary for control systems); or,

- f. the service cannot be subcontracted (such as litigation services).

If the contract includes specialty equipment or services, and documentation is submitted demonstrating that there are no MWBE firms capable of completing this portion of the contract, the specialty amount of the contract may be deducted from the total contract amount to determine the MWBE Eligible Amount and the goals will be applied to the MWBE Eligible Amount. This determination is made at the discretion of the MBO and EFC.

Example:

$$\begin{array}{rcl} \$200,000 & - & \$50,000 \\ \text{(Contract)} & \text{(Specialty equipment/service)} & \\ \hline & & = \$150,000 \\ & & \text{(MWBE Eligible Amount)} \end{array}$$

The MWBE goal is applied to the MWBE Eligible Amount.

A request for this specialty equipment/service deduction can be completed by filling out a Request for Waiver form and submitting it to the MBO. The request must include a copy of the page from the contract where the equipment/ service is described, an ESD search result for the manufacturer or manufacturer's representative, and documentation of the cost of each item. For construction Contracts, the schedule of values or bid tabulation sheet should also be submitted. Additional documentation may be requested by the MBO or EFC.

#### **IV. Subcontractor's Responsibilities**

Subcontractors should:

1. Maintain their MWBE certifications and notify the Contractor and MBO of any change in their certification status.
2. Notify the Contractor of any MWBE Subcontractors they hire so they may be included on the Contractor's Utilization Plan.
3. Respond promptly to solicitation requests by completing and submitting bid information in a timely manner.
4. Maintain business records that should include, but not be limited to, Contracts/agreements, records of receipts, correspondence, purchase orders, and canceled checks.
5. Ensure that a required EEO Policy Statement and applicable MWBE requirements are included in each subcontract.
6. Notify the MBO and EFC when contract problems arise, such as non-payment for services or when the Subcontractor is not employed as described in the MWBE Utilization Plan.

#### **V. Protests/Complaints**

Contractors or Subcontractors who have any concerns, issues, or complaints regarding the implementation of the SRF MWBE & EEO Program or wish to protest should do so in writing to the MBO and EFC. The MBO, in consultation with EFC, will review the circumstances described in the submission, investigate to develop additional information, if warranted, and determine whether action is required. If the Contractor or Subcontractor believes the issue has not been resolved to their satisfaction, they may appeal in writing to EFC for consideration.

#### **VI. Waste, Fraud and Abuse**

Subcontractors, Contractors, or Recipients who know of or suspect any instances of waste, fraud, or abuse within the MWBE & EEO Program should notify the project MBO and EFC immediately. Additionally, suspected fraud activity should be reported to the USEPA – Office of Inspector General Hotline at (888) 546-8740, the New York State Office of Inspector General at (800) 367-4448, or the ESD Compliance Office at (212) 803-3266.

## **SECTION 2            GUIDANCE FOR NEW YORK STATE CERTIFIED SERVICE-DISABLED VETERAN-OWNED BUSINESS ENTERPRISES (“SDVOB”) PARTICIPATION OPPORTUNITIES**

Contractor may contact the Office of General Services’ Division of Service-Disabled Veteran’s Business Development at 518-474-2015 or VeteransDevelopment@ogs.ny.gov to discuss methods of maximizing participation by SDVOBs on the Contract. The directory of New York State Certified SDVOBs can be viewed at: <http://ogs.ny.gov/Core/SDVOBA.asp> .

Please contact EFC if you have any questions about utilizing SDVOBs on the Contract.

## **SECTION 3            GUIDANCE FOR AMERICAN IRON AND STEEL (“AIS”) REQUIREMENT**

Since 2014, if a Recipient uses CWSRF or DWSRF financial assistance to fund all or a part of the construction, alteration, maintenance or repair a public water system or treatment works, the Recipient must use iron and steel products that are produced in the United States for the whole project.

The AIS requirement does not apply to:

1. a project for which engineering plans and specifications were submitted for review by the responsible State agency before January 17, 2014 and approved by that agency before April 15, 2014; or
2. a project funded by a financial assistance agreement with EFC that was signed before January 17, 2014.

The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, construction materials. For one of the listed products to be considered subject to the AIS requirement, it must be made of greater than 50% iron and steel, measured by material cost (with the exception of reinforced precast concrete products).

The term “produced in the United States” means that all manufacturing processes of the iron or steel, including application of coatings, take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

The EPA may waive the AIS requirement for a treatment works project if:

1. applying the requirement would be inconsistent with the public interest;
2. iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

A request for a waiver to use foreign iron or steel products must include adequate information for EPA’s evaluation of the request, including:

1. A description of the foreign and domestic iron, steel, and/or manufactured goods;
2. Unit of measure;
3. Quantity;

4. Cost;
5. Time of delivery or availability;
6. Location of the project;
7. Name and address of the proposed supplier; and,
8. A detailed justification for use of foreign iron or steel products.

Requests for AIS waivers are to be submitted to EFC. Upon review, EFC will submit AIS waiver requests to EPA. When EPA receives a request for a waiver, EPA will publish the request and any accompanying material on EPA's official public Internet site, allowing informal public input on the request for at least 15 days before granting or denying the waiver request.

Additionally, EPA has the authority to issue waivers that are national in scope. National waivers may be for specific products or in the public's interest. These waivers can be found at EPA's website at:

<https://www.epa.gov/cwsrf/american-iron-and-steel-requirement-approved-national-waivers-0>.

The "De Minimis Waiver" is noteworthy. The waiver permits the use of iron and steel products when they occur in de minimis incidental components of DWSRF or CWSRF projects, as long as:

1. the funds used for the de minimis incidental components cumulatively comprise no more than 5% of the total cost of the materials used in a project; and,
2. the cost of an individual item does not exceed 1% of the total cost of the materials used in the project.

Items covered by the de minimis waiver are:

1. essential, but incidental to the construction;
2. incorporated into the physical structure of the project; and,
3. often low-cost and bought in bulk.

Examples of "de minimis" items include: washers, screws, nuts, bolts, fasteners, miscellaneous wire, corner bead, ancillary tubing, etc.

Examples of items that are NOT incidental and therefore are not considered "de minimis" include: process fittings, tees, elbows, flanges, brackets, valves, sewer or water pipes for distribution, treatment or storage tanks, large structural support systems, etc.

To use the de minimis waiver, Contractors should prepare a record in spreadsheet form that tracks the cost of all materials incorporated into the project. This spreadsheet can be either project specific or contract specific. If it is contract specific, a material tracking record for each construction contract should be prepared and items that are subject to the AIS de minimis waiver should be highlighted. There should be a clear calculation available to indicate that the cost of the de minimis iron and steel items is 5% or less of the total cost of all materials.

Additional information, guidance and Questions and Answers about the State Revolving Fund American Iron and Steel (AIS) requirement can be found at EPA's website: <https://www.epa.gov/cwsrf/state-revolving-fund-american-iron-and-steel-ais-requirement>.

## **SECTION 4 GUIDANCE FOR APPLICABLE LABOR STANDARDS**

### **I. Davis-Bacon Act**

The Davis-Bacon Act requires Contractors and Subcontractors performing construction, alteration and repair work under Contracts in excess of \$2,000 funded from SRF monies, to pay their laborers and mechanics not less than the prevailing wage and fringe benefits for the geographic location.

For purposes of this section, "State Recipient" means EFC.

#### **A. Requirements for Recipients.**

This guidance describes how Recipients assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance under the Water Resources Reform and Development Act of 2014 (WRRDA) with respect to State Recipients and Recipients. Recipients with questions about when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring should contact the State Recipient. Recipients can also obtain guidance from DOL's web site at <http://www.dol.gov/whd>.

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements. Under the Water Resources Reform and Development Act of 2014 (WRRDA), DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund. If a Recipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the Recipient must discuss the situation with the State Recipient before authorizing work on that site.

2. Obtaining Wage Determinations.

(a) Recipients must obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting Contracts (solicitation) for activities subject to DB. These wage determinations must be incorporated into solicitations and any subsequent Contracts. Prime Contracts must contain a provision requiring that Subcontractors follow the wage determination incorporated into the prime Contract.

(i) While the solicitation remains open, the Recipient must monitor <https://beta.sam.gov> weekly to ensure that the wage determination contained in the solicitation remains current. Recipients must amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the Recipient may request a finding from the State Recipient that there is not a reasonable time to notify interested Contractors of the modification of the wage determination. The State Recipient will provide a report of its findings to the Recipient.

(ii) If the Recipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersessions DOL makes to the wage determination contained in the solicitation shall be effective unless the State Recipient, at the request of the Recipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The Recipient shall monitor <https://beta.sam.gov> on a weekly basis if it does not award the Contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

(b) If the Recipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing Contractor (ordering instrument) rather than by publishing a solicitation, the Recipient must insert the appropriate DOL wage determination from <https://beta.sam.gov> into the ordering instrument.

(c) Recipients must review all Subcontracts subject to DB entered into by prime Contractors to verify that the prime Contractor has required its Subcontractors to include the applicable wage determinations.

(d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a Recipient's Contract after the award of a Contract or the issuance of an ordering instrument if DOL determines that the Recipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the Contract or ordering instrument. If this occurs, the Recipient must either terminate the Contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the Contract or ordering instrument by change order. The Recipient's Contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

B. Additional requirements for Recipients that are not governmental entities

Recipients that are not governmental entities must submit their proposed DB wage determinations to the State Recipient for approval prior to including the wage determinations in any solicitation, Contract or issuing task orders, work assignments, or similar instruments to existing Contractors, as well as ordering instruments unless subsequently directed otherwise by the State Recipient award official as identified below.

Recipients must obtain proposed wage determinations for specific localities at <https://beta.sam.gov> . After the Recipient obtains its proposed wage determination, it must submit the wage determination to the State Recipient award official at: Timothy Burns, P.E., Director, Engineering and Program Management, New York State Environmental Facilities Corporation, at 518-402-7396 or at the following email address: Timothy.Burns@efc.ny.gov.

C. Compliance Verification

(a) The Recipient must periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that Contractors or Subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The Recipient must use Standard Form 1445 or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The Recipient must establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by Contractors or Subcontractors and the duration of the Contract or Subcontract. Recipients must increase the frequency of the interviews if the initial interviews or other information indicates that there is a risk that the Contractor or Subcontractor is not complying with DB. Recipients must immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews must be conducted in confidence.

(c) The Recipient must periodically conduct spot checks of a representative sample of weekly payroll data to verify that Contractors or Subcontractors are paying the appropriate wage rates. The Recipient must establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by Contractors or Subcontractors and the duration of the Contract or Subcontract. At a minimum, the Recipient must spot check payroll data within two weeks of each Contractor or Subcontractor's submission of its initial payroll data and two weeks prior to the completion date the Contract or Subcontract. Recipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the Contractor or Subcontractor is not complying with DB. In addition, during the examinations the Recipient must verify evidence of fringe benefit plans and payments thereunder by Contractors and Subcontractors who claim credit for fringe benefit contributions.

(d) The Recipient must periodically review Contractors' and Subcontractors' use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that Contractors and Subcontractors are not using disproportionate numbers of laborers, trainees and apprentices. These reviews must be conducted in accordance with the schedules for spot checks and interviews described in Item (b) and (c) immediately above.

(e) Upon the request of EFC, the Recipient must provide EFC with a written certification indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies from Contractors/Subcontractors for the specified week.

(f) Recipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at <https://beta.sam.gov> .

## **II. Responsibilities of Contractors and Subcontractors**

After execution of any SRF eligible Contracts, the Contractor and Subcontractor have the following responsibilities:

1. Post Davis Bacon Wage Poster and applicable federal, state, and local wages in a visible area at the construction site. This poster may be found on the EFC website under the Resource Library. (Refer to the attached required forms)
2. Make your employees available for wage interviews if necessary. Wage interviews must be conducted confidentially and using Labor Standard Interview Form (SF-1445). (Refer to the attached required forms)
3. Use federal payroll form WH-347 and complete the certifications on the back. If another form is being used, inform the Recipient and obtain a determination that the form is equivalent to the federal form. (Refer to the attached required forms)
4. Pay the higher of applicable prevailing federal, state, or local wages, including benefits (fringe & holidays), to each trade and overtime not less than one and one-half times the basic rate of pay for hours in excess of forty hours on Contracts in excess of \$100,000. The wage rates apply to Subcontractor trades as well.
5. Maintain proof of apprentice and trainee ratios for both Contractor and Subcontractor and certifications onsite.
6. Pay wages to your employees and your Subcontractors on a weekly basis. Ensure that your Subcontractors are paying their employees weekly.
7. Ensure that the Subcontracts contain the Davis Bacon contract language, the applicable federal, state, or local wage determinations and equal employment opportunity language. This language is provided in the Part 2: Required Contract Language. Federal wage determinations are available at <https://beta.sam.gov>.
8. Provide payroll forms and apprentice and trainee certifications to the Recipient for their records.
9. Report potential waste, fraud and abuse violations to the EPA Davis Bacon Contact and DOL Wages and Hours District Office found on their website. <https://beta.sam.gov>. Any violations in payroll reporting or unpaid wages are subject to a daily monetary penalty.

## **SECTION 5 GUIDANCE FOR STATE AND/OR LOCAL PREVAILING WAGE REQUIREMENTS**

Contractors and Subcontractors working under a public works contract are subject to labor standards under State Labor Law, including but not limited to prevailing wage requirements, and may be subject to additional labor requirements under applicable local laws. When preparing the bid for an SRF project, the Contractor, and any Subcontractors, must use the higher of the applicable prevailing federal, State, or local wage rates paid to each trade.

## **SECTION 6 GUIDANCE FOR REQUIREMENTS REGARDING SUSPENSION AND DEBARMENT**

A list of debarred and suspended contractors, pursuant to 2 CFR Parts 180 and 1532, 29 CFR § 5.12, and Executive Order 11246 is available on the US Department of Labor's website at <https://www.sam.gov/portal/public/SAM>.

A list of contractors and subcontractors deemed ineligible to submit a bid on or be awarded a public contract or subcontract, pursuant to Article 8 of the State Labor Law, is available on the New York State Department of Labor's website at <http://labor.ny.gov/workerprotection/publicwork/PDFs/debarred.pdf>

A list of contractors deemed ineligible to submit a bid is maintained by Empire State Development's Division of Minority and Women's Business Development.



## **SECTION 7            GUIDANCE FOR RESTRICTIONS ON LOBBYING**

Each Contractor and any Subcontractor that has a Contract or Subcontract exceeding \$100,000 shall provide to the Recipient a completed Certification Regarding Lobbying pursuant to 40 CFR Part 34 ("Lobbying Certification") in the form attached hereto as Attachment 9 consistent with the prescribed form provided in Appendix A to 40 CFR Part 34. The form provides a certification that the Contractor or Subcontractor will not expend appropriated federal funds to pay any person for influencing or attempting to influence an officer or employee of any agency, Member of Congress, officer or employee of Congress or any employee of any Member of Congress in accordance with the provisions of 40 CFR Part 34, and to maintain such certification for their own records.



## **SECTION 8            SUMMARY OF CONTRACTOR REQUIREMENTS FOR SRF-FUNDED PROJECTS**

Forms can be found as attachments to this document or online at [www.efc.ny.gov](http://www.efc.ny.gov)

Forms should be submitted electronically via email or through EFC's [dropbox](#)

### **To be submitted with the bid:**

- ☐ Lobbying Certification
- ☐ AIS Contractor's Certification

**Refer to Part 3  
Guidance Section  
Section 7  
Section 3**

### **To be submitted prior to or upon Contract award:**

- ☐ Executed Subcontracts, agreements, and purchase orders
- ☐ MWBE Utilization Plan and/or Waiver Request

Section 1

### **Tasks for construction start:**

- ☐ Ensure that all Subcontracts contain Part 2: Required Contract Language
- ☐ Post EEO Poster
- ☐ Pay the higher of prevailing federal, state, or local wages including benefits
- ☐ Post Davis Bacon Wage Poster AND Wage Rates
- ☐ Use Federal Payroll Form (WH-347)
- ☐ Obtain apprentice and trainee certifications
- ☐ Obtain AIS Manufacturer's Certifications for all iron & steel products

Section 1

Section 4

Section 4

Section 4

Section 4

Section 3

### **Ongoing documentation & tasks:**

- ☐ Submit EEO-1 Report, online
- ☐ Submit Monthly MWBE Reports to MBO
- ☐ Maintain weekly certified payrolls for all Prime & Subcontractors
- ☐ Maintain proof of payments for MWBE Subcontractors
- ☐ Maintain AIS Manufacturer's Certifications

Section 1

Section 1

Section 4

Section 1

Section 3

# ATTACHMENTS (Required Forms)

## **Attachment 1 – Monthly MWBE Contractor Compliance Report**

**New York State Environmental Facilities Corporation**  
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**  
**("Monthly MWBE-SDVOB Report")**

**Instructions:**

- Contractors are to complete the report in Word version and email to the Recipient's Minority Business Officer ("MBO") on a monthly basis.
- If you require additional pages, you may find them on EFC's website at [www.efc.ny.gov](http://www.efc.ny.gov).
- All** MWBE Subcontractors for this contract **MUST** be listed on the form regardless of whether they were paid this month.
- Please save Report as "*MReport – (Project No). – (Municipality) – (Firm Name) – (Date)*" and send the Word version of this document.
- Proofs of payment in the amounts shown below must be transmitted to the MBO with the report.

Municipality:		County:		Contract ID:		Month:	Year:	
Project No.:		GIGP/EPG No:		Registration No. (NYC only):				
Prime Contractor/Service Provider:				Award Date:		Start Date:		
<b>Date all MWBE / SDVOB subs paid in full:</b>								
<b>Signature of Contractor:</b> <input type="checkbox"/> I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief.         Date:								
Last Month's Contract Amt: \$ Revised Contract Amt: \$  Change Order Amt: \$	<b>MWBE Eligible Amt: \$</b> (Goals are applied to this amount and includes eligible change orders, amendments & waivers)		<b>EFC MWBE Goals</b>		<b>Total Paid to Prime</b>			
			MBE: %	MBE Amt: \$				
	<b>SDVOB Eligible Amount \$</b>		WBE: %	WBE Amt: \$	Total Paid this Month: \$ Total Paid to Date: \$			
			Total: %	Total Amt: \$				
		<b>EFC SDVOB Goals</b>						
		SDVOB 6 %	SDVOB Amt: \$					
NYS Certified MWBE / SDVOB Contractor & Subcontractor		Please Specify Any Revisions this Month.		Subcontractor Total Amount		Payments this Month	Previous Payments	Total Payments Made to Date
				Original	Revised			
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A		<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED						
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A		<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED						

**New York State Environmental Facilities Corporation**  
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**  
**("Monthly MWBE-SDVOB Report")**

NYS Certified M/WBE / SDVOB Contractor & Subcontractor	Please Specify Any Revisions this Month.	Subcontractor Contract Amount		Payments this Month	Previous Payments	Total Payments Made to Date
		Original	Revised			
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					

**New York State Environmental Facilities Corporation**  
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**  
**("Monthly MWBE-SDVOB Report")**

NYS Certified M/WBE / SDVOB Contractor & Subcontractor	Please Specify Any Revisions this Month.	Subcontractor Total Amount		Payments this Month	Previous Payments	Total Payments Made to Date
		Original	Revised			
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: <u>Choose all that apply:</u> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: <u>MWBE Only - Select Only One:</u> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					

**New York State Environmental Facilities Corporation**  
**Monthly Minority- & Women- Owned Business Enterprise (MWBE) Contractor Compliance Report**  
**("Monthly MWBE-SDVOB Report")**

NYS Certified M/WBE / SDVOB Contractor & Subcontractor	Please Specify Any Revisions this Month.	Subcontractor Total Amount		Payments this Month	Previous Payments	Total Payments Made to Date
		Original	Revised			
Name: Fed. Employer ID#: Choose all that apply: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: MWBE Only - Select Only One: <input type="checkbox"/> Broker __% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: Choose all that apply: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: MWBE Only - Select Only One: <input type="checkbox"/> Broker __% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: Choose all that apply: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: MWBE Only - Select Only One: <input type="checkbox"/> Broker __% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Name: Fed. Employer ID#: Choose all that apply: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> SDVOB <input type="checkbox"/> DSDVBD Control #: MWBE Only - Select Only One: <input type="checkbox"/> Broker __% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<input type="checkbox"/> Subcontractor is REMOVED <input type="checkbox"/> NEW Subcontractor <input type="checkbox"/> Subcontract Amt. INCREASED <input type="checkbox"/> Subcontract Amt. DECREASED					
Additional Pages can be found at <a href="http://www.efc.ny.gov">www.efc.ny.gov</a> TOTAL						
Please explain any revisions and note the scope of work that new subcontractors will be providing. Please note that change orders over \$25K may require that good faith efforts be made to obtain additional participation:						

## Attachment 2 – MWBE Utilization Plan



**NYS Environmental Facilities Corporation  
Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

**Instructions for Contractors & Service Providers:**

Contractors and Service Providers must complete Sections 2 and 3. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format to the Recipient's designated Minority Business Officer (MBO) no later than the date of contract execution.** Incomplete forms will be found deficient. If more than 10 subcontractors are used, additional pages for Section 3 can be found on EFC's website.

**If the prime contract is being performed by the parties to a Joint Venture, Teaming Agreement, or Mentor-Protégé Agreement that includes a certified MWBE, please contact EFC for assistance.**

MWBE firms must be certified by the NYS Empire State Development Corporation (ESD) in order to be counted towards satisfaction of MWBE participation goals. The utilization of certified MWBEs for non-commercially useful functions may not be counted towards utilization of certified MWBEs in the Utilization Plan. Please note whether a firm is serving as a broker or supplier on the contract. A broker is denoted by NAICS code 425120 and is designated as a broker in ESD's MWBE Directory. A supplier is denoted by a NAICS code beginning with 423 or 424, or a NIGP code that does not begin with the number 9, and is designated as a supplier in ESD's MWBE Directory. If a firm is serving as a broker, please additionally provide the percentage of the broker's commission on the contract.

See the Bid Packet at [www.efc.ny.gov](http://www.efc.ny.gov) or consult your designated MBO for further guidance.

**Instructions for Minority Business Officers (MBO):**

The MBO must complete Section 1. The MBO may designate an Authorized Representative to complete and submit quarterly payment reports on its behalf, and, if so designated, the MBO's Authorized Representative must also complete Section 1. The Authorized Representative may only submit quarterly payment reports on behalf of the MBO and may not submit any other required forms or reports for the MBO. The MBO must complete Section 1 even if designating an Authorized Representative. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format via e-mail to your EFC MWBE Representative.**

The subject heading of the e-mail to the EFC MWBE Representative should follow the format "UP, Project Number, Contractor." EFC will review the Utilization Plan and notify the MBO via e-mail of its acceptance or denial.

**NYS Environmental Facilities Corporation  
Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

SECTION 1: MUNICIPAL INFORMATION			
Recipient/Municipality:		County:	
Project No.:	GIGP/EPG No.:	Contract ID:	Registration No. (NYC only):
Minority Business Officer:		Email:	Phone #:
Address of MBO:			
<b>Electronic Signature of MBO:</b> <input type="checkbox"/> I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief.			<b>Date:</b>
<b>Complete if applicable:</b>			
Authorized Representative:		Title:	
Authorized Rep. Company:		Email:	Phone #:
<b>Electronic Signature of Authorized Rep.:</b> <input type="checkbox"/> I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief.			<b>Date:</b>

SECTION 2: PRIME CONTRACTOR / SERVICE PROVIDER INFORMATION				
Firm Name:			Contract Type: <input type="checkbox"/> Construction <input type="checkbox"/> Other Services	
<b>Prime Firm is Certified as:</b> <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> N/A <input type="checkbox"/> Other: Please repeat information in the Utilization Plan below (Section 3). If dual certified, you must select either MBE <u>or</u> WBE.				
Address:		Phone #:		Fed. Employer ID #:
Description of Work:				
Award Date:	Start Date:	Completion Date:	<b>MWBE GOAL Total</b>	<b>PROPOSED MWBE Participation</b>
<b>Total Contract Amount: \$</b> <b>MWBE Eligible Contract Amount: \$</b> (MWBE Goals are applied to this amount and includes all change orders, amendments, & waivers)			<b>MBE:</b> %   \$	<b>MBE:</b> %   \$
			<b>WBE:</b> %   \$	<b>WBE:</b> %   \$
			<b>Total:</b> %   \$	<b>Total:</b> %   \$

**NYS Environmental Facilities Corporation  
Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

SECTION 3: MWBE SUBCONTRACTOR INFORMATION				
<b>This Submittal is:</b>	<input type="checkbox"/> The First/Original Utilization Plan <input type="checkbox"/> Revised Utilization Plan #:			
NYS Certified M/WBE Subcontractor Info		Contract Amount:		For EFC Use:
		MBE (\$)	WBE (\$)	
Name:	Fed. Employer ID#:			
Address:	Phone #:			
Scope of Work:	Email:			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	Start Date:			
Select Only One: <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	Completion Date:			
Full Contract Amount: \$				
Name:	Fed. Employer ID#:			
Address:	Phone #:			
Scope of Work:	Email:			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	Start Date:			
Select Only One: <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	Completion Date:			
Full Contract Amount: \$				
Name:	Fed. Employer ID#:			
Address:	Phone #:			
Scope of Work:	Email:			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	Start Date:			
Select Only One: <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	Completion Date:			
Full Contract Amount: \$				
Name:	Fed. Employer ID#:			
Address:	Phone #:			
Scope of Work:	Email:			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	Start Date:			
Select Only One: <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	Completion Date:			
Full Contract Amount: \$				

**NYS Environmental Facilities Corporation  
Minority- & Women- Owned Business Enterprise (MWBE) Utilization Plan**

SECTION 3: M/WBE SUBCONTRACTOR INFORMATION continued				
<b>Name:</b>	<b>Fed. Employer ID#:</b>			
<b>Address:</b>	<b>Phone #:</b>			
<b>Scope of Work:</b>	<b>Email:</b>			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	<b>Start Date:</b>			
<b>Select Only One:</b> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<b>Completion Date:</b>			
<b>Full Contract Amount: \$</b>				
<b>Name:</b>	<b>Fed. Employer ID#:</b>			
<b>Address:</b>	<b>Phone #:</b>			
<b>Scope of Work:</b>	<b>Email:</b>			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	<b>Start Date:</b>			
<b>Select Only One:</b> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<b>Completion Date:</b>			
<b>Full Contract Amount: \$</b>				
<b>Name:</b>	<b>Fed. Employer ID#:</b>			
<b>Address:</b>	<b>Phone #:</b>			
<b>Scope of Work:</b>	<b>Email:</b>			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	<b>Start Date:</b>			
<b>Select Only One:</b> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<b>Completion Date:</b>			
<b>Full Contract Amount: \$</b>				
<b>Name:</b>	<b>Fed. Employer ID#:</b>			
<b>Address:</b>	<b>Phone #:</b>			
<b>Scope of Work:</b>	<b>Email:</b>			
Select Only One: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> Other:	<b>Start Date:</b>			
<b>Select Only One:</b> <input type="checkbox"/> Broker ___% <input type="checkbox"/> Supplier <input type="checkbox"/> N/A	<b>Completion Date:</b>			
<b>Full Contract Amount: \$</b>				
<b>SIGNATURE</b>				
<b>Electronic Signature of Contractor:</b> <input type="checkbox"/> I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and that all MWBE subcontractors will perform a commercially useful function. <b>Name (Please Type):</b>				<b>Date:</b>

## **Attachment 3 – MWBE Waiver Request**

**New York State Environmental Facilities Corporation  
Minority & Women Owned Business Enterprise (MWBE) Waiver Request Form**

**Instructions for Contractors & Service Providers:**

Contractors and Service Providers must complete Sections 2, 3, and 4. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format to the Recipient's designated Minority Business Officer (MBO).** Incomplete forms will be found deficient.

See the Bid Packet at [www.efc.ny.gov](http://www.efc.ny.gov) or consult your designated MBO for further guidance.

**Instructions for Minority Business Officers (MBO):**

The MBO must complete Section 1. **Submit the completed, signed (electronic signature box checked and dated) form in Microsoft Word format via e-mail to your EFC MWBE Representative.** The subject heading of the e-mail to the EFC MWBE Representative should follow the format "Waiver Request, Project Number, Contractor." EFC will review and notify the MBO via e-mail of its acceptance or denial.

If a partial MWBE waiver is requested, an MWBE Utilization Plan must also be submitted for the amount of proposed MWBE participation.

SECTION 1: MUNICIPAL INFORMATION				
Recipient/Municipality:			County:	
Project No.:	GIGP/EPG No.:	Contract ID:	Registration No. (NYC only):	
Minority Business Officer (MBO):		Email:	Phone #:	
Address of MBO:				
Signature of MBO: <input type="checkbox"/> I certify that the information submitted herein is true, accurate and complete to the best of my knowledge and belief.				Date:

SECTION 2: PRIME CONTRACTOR / SERVICE PROVIDER INFORMATION				
Firm Name:			Contract Type: <input type="checkbox"/> Construction <input type="checkbox"/> Other Services	
Prime Firm is Certified as: <input type="checkbox"/> MBE <input type="checkbox"/> WBE <input type="checkbox"/> N/A <input type="checkbox"/> Other:				
Address:		Phone #:	Fed. Employer ID #:	
Contact Information of Firm Representative Authorized to Discuss Waiver Request:				
Name:	Title:	Phone #:	E-mail:	
Description of Work:			<b>EFC MWBE GOAL Total</b>	
Award Date:	Start Date:	Completion Date:	<b>MBE:</b>	% \$
Total Contract Amount: \$ MWBE Eligible Contract Amount: \$ (MWBE Goals are applied to this amount and includes all change orders, amendments, & waivers)			<b>WBE:</b>	% \$
			<b>Total:</b>	% \$

**New York State Environmental Facilities Corporation  
Minority & Women Owned Business Enterprise (MWBE) Waiver Request Form**

**SECTION 3: TYPE OF MWBE WAIVER REQUESTED**

1. ☐ **Full Waiver** (No MWBE participation)
2. ☐ **Partial Waiver** (Less than the MWBE goals; indicate below the proposed MWBE participation)

**PROPOSED MWBE Participation**

**MBE:**        %    \$

**WBE:**        %    \$

**Total:**       %    \$

3. ☐ **Specialty Equipment/Services Exclusion** (Must be of SIGNIFICANT cost - list of equipment and cost must be attached in addition to the supporting documentation outlined below)

**SECTION 4: SUPPORTING DOCUMENTATION**

To be considered, the Request for Waiver Form must be accompanied by the documentation requested in items 1 – 9, as listed below. If a Specialty Equipment Exclusion is requested, it must be accompanied by the documentation requested in items 1 - 13. If a Specialty Services Exclusion is requested, it must be accompanied by the items requested in items 1 – 9 and item 14. Copies of the following information and all relevant supporting documentation must be submitted along with the request. Please contact EFC for assistance, including sample documentation.

1. A letter of explanation setting forth your basis for requesting a partial or total waiver and detailing the good faith efforts that were made.
2. Copies of advertisements in any general circulation, trade association, and minority- and women-oriented publications in which you solicited MWBEs for the purposes of complying with your participation goals, with the dates of publication.
3. Screenshots of search results (by business description or commodity code) from Empire State Development Corporation's (ESD) MWBE Directory of all certified MWBEs that were solicited for purposes of complying with your MWBE participation goals.
4. Copies of faxes, letters, or e-mails sent to MWBE firms to solicit participation and their responses.
5. A log of solicitation results, consisting of the list of MWBE firms solicited for the contract and the outcome of the solicitations. The log should be broken out into separate areas for each task that is solicited (e.g., trucking, materials, electricians) and clearly provide a rationale for firms included on the completed Utilization Plan as well as for those not chosen. The log should show: that each MWBE firm was contacted twice by two different methods (e.g., fax and phone); who was spoken to; what was said; and the final outcome of the solicitation.
6. A description of any contract documents, plans, or specifications made available to MWBEs for purposes of soliciting their bids and the date and manner in which these documents were made available. Specifically, include information on the scope of work in the contract and a breakout of tasks or equipment, such as

**New York State Environmental Facilities Corporation  
Minority & Women Owned Business Enterprise (MWBE) Waiver Request Form**

a schedule of values for a construction contract or a proposal or excerpt from a professional services agreement.

7. Documentation of any negotiations between you, the Contractor, and the MWBEs undertaken for purposes of complying with your MWBE participation goals.
8. Any other information you deem relevant which may help us in evaluating your request for a waiver. Examples may include sign-in sheets from any pre-bid meetings where MWBE firms were invited, attendance at MWBE forums, etc.
9. EFC and the MBO reserve the right to request additional information and/or documentation.

**Additional Documentation for Requests for Specialty Equipment Exclusions:**

10. Copies of the appropriate pages of the technical specification related to the equipment showing the choices for manufacturers or other information that limits the choice of vendor.
11. Letter, e-mail or screenshot of website from the manufacturer listing their distributors in NYS and the locations.
12. Screenshots of ESD's MWBE Directory searches for the manufacturer and distributor showing that they are not found in the Directory.
13. An invoice or executed purchase order showing the value of the equipment.

**Additional Documentation for Requests for Specialty Service Exclusions:**

14. A letter of explanation containing information about the scope of work and why no MWBE firms could be subcontracted to provide that service.

**Note:** Unless a Total Waiver has been granted, Firms will be required to submit all reports and documents pursuant to the provisions set forth in the procurement and/or contract, as deemed appropriate by EFC, to determine MWBE compliance. In cases where EFC accepts a full or partial waiver of MWBE participation goals, the waiver request will be posted to EFC's website.

**SIGNATURE**

**Electronic Signature of Contractor:**

☐ I certify that the information submitted herein is true, accurate and complete to the best of my knowledge.

**Name:** (Please Type):

**Date:**



## **Attachment 4 – Lobbying Certification**



# Environmental Facilities Corporation

**New York State Environmental Facilities Corporation  
CERTIFICATION REGARDING LOBBYING  
FOR  
CONTRACTS, GRANTS, LOANS, AND  
COOPERATIVE AGREEMENTS  
40 CFR Part 34**

**SRF Project No.:** \_\_\_\_\_

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company Name: \_\_\_\_\_

Date: \_\_\_\_\_

Contract ID: \_\_\_\_\_

## **Attachment 5 – AIS Contractor’s Certification**



# Environmental Facilities Corporation

AIS CONTRACTOR CERTIFICATION  
FOR CONSTRUCTION CONTRACTS PAID FOR WITH FUNDS FROM  
THE NYS CLEAN WATER STATE REVOLVING FUND OR  
THE NYS DRINKING WATER STATE REVOLVING FUND VIA THE  
NYS ENVIRONMENTAL FACILITIES CORPORATION

Project Title: \_\_\_\_\_

Contractor's Name: \_\_\_\_\_

Contract ID: \_\_\_\_\_

SRF Project #: \_\_\_\_\_

SRF Recipient Name: \_\_\_\_\_

I certify that the iron and steel products that will be permanently incorporated into the public water system or wastewater treatment works project under this construction contract will have been produced in the United States, in accordance with the requirements of the US Environmental Protection Agency. I will also develop and maintain at the project location the necessary documentation to demonstrate that the iron and steel products incorporated into the project were produced in the United States, and make such documentation available to The NYS Environmental Facilities Corporation or their authorized representatives, upon request.

Signature: \_\_\_\_\_

Name (print): \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## **Attachment 6 – AIS Manufacturer’s Certification**

1. The following information is provided as a manufacturer's sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

*Date*

*Company Name*

*Company Address*

*City, State Zip*

*Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)*

*I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.*

*Item, Products and/or Materials:*

*1. Xxx*

*2. Xxx*

*3. Xxx*

*Such process took place at the following location: \_\_\_\_\_*

*If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.*

*[Signed by company representative]*

2. The following information is provided as a manufacturer's sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

*Date*

*Company Name*

*Company Address*

*City, State Zip*

*Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)*

*I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.*

*Item, Products and/or Materials:*

*1. Xxx*

*2. Xxx*

*3. Xxx*

*Such process took place at the following location: \_\_\_\_\_*

*If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.*

*[Signed by company representative]*

**Attachment 7 – Federal Payroll Form (WH-347)**



NAME OF CONTRACTOR		OR SUBCONTRACTOR		ADDRESS		OMB No.: 1235-0008 Expires: 02/28/2018	
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PAYROLL NO.		FOR WEEK ENDING		PROJECT AND LOCATION		PROJECT OR CONTRACT NO.	
-------------	--	-----------------	--	----------------------	--	-------------------------	--

(1)  NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2)  NO. OF WITHHOLDING EXEMPTIONS	(3)  WORK CLASSIFICATION	OT OR ST.	(4) DAY AND DATE							(5)  TOTAL HOURS	(6)  RATE OF PAY	(7)  GROSS AMOUNT EARNED	(8)  DEDUCTIONS						(9)  NET WAGES PAID FOR WEEK
														FICA	WITH- HOLDING TAX			OTHER	TOTAL DEDUCTIONS	
				HOURS WORKED EACH DAY																
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Date \_\_\_\_\_

I, \_\_\_\_\_  
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by \_\_\_\_\_ on the \_\_\_\_\_  
(Contractor or Subcontractor)  
\_\_\_\_\_ ; that during the payroll period commencing on the \_\_\_\_\_  
(Building or Work)  
\_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, and ending the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_,  
all persons employed on said project have been paid the full weekly wages earned, that no rebates have  
been or will be made either directly or indirectly to or on behalf of said  
\_\_\_\_\_ from the full  
(Contractor or Subcontractor)  
weekly wages earned by any person and that no deductions have been made either directly or indirectly  
from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part  
3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948,  
63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2) That any payrolls otherwise under this contract required to be submitted for the above period are  
correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the  
applicable wage rates contained in any wage determination incorporated into the contract; that the classifications  
set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship  
program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and  
Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered  
with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:  
(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

- in addition to the basic hourly wage rates paid to each laborer or mechanic listed in  
the above referenced payroll, payments of fringe benefits as listed in the contract  
have been or will be made to appropriate programs for the benefit of such employees,  
except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

- Each laborer or mechanic listed in the above referenced payroll has been paid,  
as indicated on the payroll, an amount not less than the sum of the applicable  
basic hourly wage rate plus the amount of the required fringe benefits as listed  
in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR  
SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE  
31 OF THE UNITED STATES CODE.

## Attachment 8 – EEO Poster

# Equal Employment Opportunity is **THE LAW**

## **Private Employers, State and Local Governments, Educational Institutions, Employment Agencies and Labor Organizations**

Applicants to and employees of most private employers, state and local governments, educational institutions, employment agencies and labor organizations are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Title VII of the Civil Rights Act of 1964, as amended, protects applicants and employees from discrimination in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment, on the basis of race, color, religion, sex (including pregnancy), or national origin. Religious discrimination includes failing to reasonably accommodate an employee's religious practices where the accommodation does not impose undue hardship.

### **DISABILITY**

Title I and Title V of the Americans with Disabilities Act of 1990, as amended, protect qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship.

### **AGE**

The Age Discrimination in Employment Act of 1967, as amended, protects applicants and employees 40 years of age or older from discrimination based on age in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment.

### **SEX (WAGES)**

In addition to sex discrimination prohibited by Title VII of the Civil Rights Act, as amended, the Equal Pay Act of 1963, as amended, prohibits sex discrimination in the payment of wages to women and men performing substantially equal work, in jobs that require equal skill, effort, and responsibility, under similar working conditions, in the same establishment.

### **GENETICS**

Title II of the Genetic Information Nondiscrimination Act of 2008 protects applicants and employees from discrimination based on genetic information in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. GINA also restricts employers' acquisition of genetic information and strictly limits disclosure of genetic information. Genetic information includes information about genetic tests of applicants, employees, or their family members; the manifestation of diseases or disorders in family members (family medical history); and requests for or receipt of genetic services by applicants, employees, or their family members.

### **RETALIATION**

All of these Federal laws prohibit covered entities from retaliating against a person who files a charge of discrimination, participates in a discrimination proceeding, or otherwise opposes an unlawful employment practice.

### **WHAT TO DO IF YOU BELIEVE DISCRIMINATION HAS OCCURRED**

There are strict time limits for filing charges of employment discrimination. To preserve the ability of EEOC to act on your behalf and to protect your right to file a private lawsuit, should you ultimately need to, you should contact EEOC promptly when discrimination is suspected:

The U.S. Equal Employment Opportunity Commission (EEOC), 1-800-669-4000 (toll-free) or 1-800-669-6820 (toll-free TTY number for individuals with hearing impairments). EEOC field office information is available at [www.eeoc.gov](http://www.eeoc.gov) or in most telephone directories in the U.S. Government or Federal Government section. Additional information about EEOC, including information about charge filing, is available at [www.eeoc.gov](http://www.eeoc.gov).

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## Employers Holding Federal Contracts or Subcontracts

Applicants to and employees of companies with a Federal government contract or subcontract are protected under Federal law from discrimination on the following bases:

### **RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN**

Executive Order 11246, as amended, prohibits job discrimination on the basis of race, color, religion, sex or national origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment.

### **INDIVIDUALS WITH DISABILITIES**

Section 503 of the Rehabilitation Act of 1973, as amended, protects qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship. Section 503 also requires that Federal contractors take affirmative action to employ and advance in employment qualified individuals with disabilities at all levels of employment, including the executive level.

### **DISABLED, RECENTLY SEPARATED, OTHER PROTECTED, AND ARMED FORCES SERVICE MEDAL VETERANS**

The Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, 38 U.S.C. 4212, prohibits job discrimination and requires affirmative action to employ and advance in employment disabled veterans, recently separated veterans (within

three years of discharge or release from active duty), other protected veterans (veterans who served during a war or in a campaign or expedition for which a campaign badge has been authorized), and Armed Forces service medal veterans (veterans who, while on active duty, participated in a U.S. military operation for which an Armed Forces service medal was awarded).

### **RETALIATION**

Retaliation is prohibited against a person who files a complaint of discrimination, participates in an OFCCP proceeding, or otherwise opposes discrimination under these Federal laws.

Any person who believes a contractor has violated its nondiscrimination or affirmative action obligations under the authorities above should contact immediately:

The Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, 1-800-397-6251 (toll-free) or (202) 693-1337 (TTY). OFCCP may also be contacted by e-mail at [OFCCP-Public@dol.gov](mailto:OFCCP-Public@dol.gov), or by calling an OFCCP regional or district office, listed in most telephone directories under U.S. Government, Department of Labor.

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## Programs or Activities Receiving Federal Financial Assistance

### **RACE, COLOR, NATIONAL ORIGIN, SEX**

In addition to the protections of Title VII of the Civil Rights Act of 1964, as amended, Title VI of the Civil Rights Act of 1964, as amended, prohibits discrimination on the basis of race, color or national origin in programs or activities receiving Federal financial assistance. Employment discrimination is covered by Title VI if the primary objective of the financial assistance is provision of employment, or where employment discrimination causes or may cause discrimination in providing services under such programs. Title IX of the Education Amendments of 1972 prohibits employment discrimination on the basis of sex in educational programs or activities which receive Federal financial assistance.

### **INDIVIDUALS WITH DISABILITIES**

Section 504 of the Rehabilitation Act of 1973, as amended, prohibits employment discrimination on the basis of disability in any program or activity which receives Federal financial assistance. Discrimination is prohibited in all aspects of employment against persons with disabilities who, with or without reasonable accommodation, can perform the essential functions of the job.

If you believe you have been discriminated against in a program of any institution which receives Federal financial assistance, you should immediately contact the Federal agency providing such assistance.

## **Exhibit D**



# Village of Suffern

61 Washington Avenue  
Suffern, New York 10901

Telephone: (845) 357-2600 • FAX: (845) 357-0649  
[www.suffernvillage.com](http://www.suffernvillage.com)

## VILLAGE OF SUFFERN

### RESOLUTION NO. 6, 2013

WHEREAS, the New York State Legislature adopted Article 23 of the New York State Labor Law in 1961 to authorize the State Commissioner of Lab or to develop standards for apprenticeship training and a process for certifying programs which meet said standards, and;

WHEREAS, the promotion of apprenticeship training programs will expand the pool of skilled workers in the Village of Suffern by providing many residents the means to earn a decent living thereby fostering the local and regional economies; and

WHEREAS, Article 8, Section 222 of New York State Labor Law authorizes villages to incorporate Project Labor Agreements involving multiple trades where doing so would be cost effective.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Trustees of the Village of Suffern hereby establishes a policy to promote apprenticeship training as authorized by Section 816-b of New York State Labor Law, and be it

FURTHER RESOLVED, that the term "Public Works Contract," for the purposes of this resolution, shall mean any contract to which the Village of Suffern shall be a signatory which involves the construction, reconstruction, improvement, rehabilitation, installation, alteration,



renovation, demolition of any building, facility, physical structure, highway or bridge, sewer or drainage facility with a value in excess of \$250,000.00, and be it

FURTHER RESOLVED, that "contractor or subcontractor" shall mean a contractor or subcontractor which directly employs labor under a Public Works Contract or Drainage Contract for which an apprenticeship program has been approved by the New York State Commissioner of Labor in accordance with Article 23 of New York State Labor Law, and be it

FURTHER RESOLVED, that the Village of Suffern hereby requires any contractor or subcontractor, prior to entering into a Public Works Contract or Drainage Contract with the Village of Suffern to have apprenticeship agreements, appropriate for the type and scope of work to be performed, which have been registered with, and approved by, the New York State Commissioner of Labor in accordance with Article 23 of New York State Labor Law anything in Section 103 of the New York State General Municipal Law to the contrary notwithstanding, and be it

FURTHER RESOLVED, that the Village shall also, as permitted by Section 222 of New York State Labor Law, conduct feasibility studies and consider the use of Project Labor Agreements in Public Works Contracts involving multiple trades, and be it

FURTHER RESOLVED, that the Superintendent of Public Works is hereby authorized, empowered, and directed to promulgate such rules and regulations necessary and appropriate for the implementation and enforcement of any provisions of the law, and be it

FURTHER RESOLVED, that the Board of Trustees acting as lead agency pursuant to the

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State Environmental Quality Review Act (SEQRA) hereby finds and determines that this resolution constitutes a Type II action pursuant to Section 617.15(c)(20) and (27) of Title 6 of the New York Code of Rules and Regulations (5 NYCRR) and within the meaning of Section 8-0109(2) of the New York State Environmental Conservation Law as a promulgation of regulations, rules, policies, procedures, and legislative decisions in connection with continuing agency administration, management and information collection, and be it

FURTHER RESOLVED, that if any clause, sentence, paragraph, subdivision, section or part of this law or the application thereof to any person, individual, corporation, firm, partnership, entity, or circumstance, shall be adjudged by any court of competent jurisdiction to be invalid or unconstitutional, such order or judgment shall not affect, impair, or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, subdivision, section or part of this law, or in its application to the person, individual, corporation, firm, partnership, entity, or circumstance, directly involved in the controversy in which judgment or order shall be rendered.



# Fact SHEET

## Apprenticeship Program

### What is Apprenticeship?

Apprenticeship is a time-honored approach to training skilled workers through a combination of on-the-job training and classroom instruction. Apprentices are full-time employees who produce high-quality work while they learn skills that enhance their employment prospects. An apprentice operates under the close supervision of a skilled worker on the job and takes related classroom instruction at night or on weekends. A graduated pay scale assures that salary reflects the degree of skill achieved.

### Who may operate an Apprenticeship Program?

Apprenticeship programs are conducted by employers, jointly by employers and unions, or by groups of employers. The State Department of Labor registers apprenticeship programs, working with forward-looking businesses across the state to develop the skilled workforce of the future. Training funds may be available for some programs.

### What are the advantages of operating a registered Apprenticeship Program?

*Ready Source of Trained Workers* - You know that there is a steady supply of competent workers because you have invested in their future by training them in-house.

*Economical* - Apprentice Training Programs cost businesses very little because the participants work while they learn. Sponsors incur the costs associated with classroom learning.

*Reduced Turnover* - Being an apprentice assures workers that their jobs have a future. Their satisfaction helps keep them on the job for you.

*Better Employee Relations* - You establish a mutually beneficial association with the apprentices who work for you.

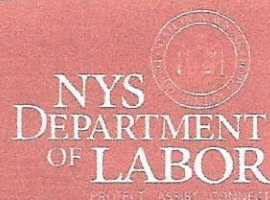
*Public Recognition* - Apprenticeship training programs approved by New York State enjoy the respect of industry and labor alike, and are nationally recognized and therefore portable.

### What jobs are appropriate for Apprenticeship Programs?

Apprenticeship opportunities are available for a wide range of positions, from skilled crafts to health care to information technology. Call your Apprentice Program representative to see if your job functions fit the bill, or look online at [www.labor.ny.gov/apprenticeship/appindex.shtm](http://www.labor.ny.gov/apprenticeship/appindex.shtm) for a list of apprenticeable occupations in New York State.

### Who can help me set up an Apprentice Program?

The State Department of Labor staff can provide, free of charge, complete details and technical assistance in setting up your own apprentice training program. Program offices are listed on the back; or call 1-800-HIRE-992.



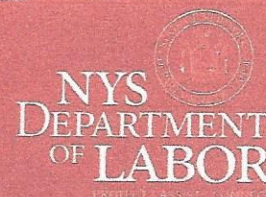
FIELD OFFICES	COUNTIES	PHONE	FAX
<b>Long Island</b> 303 W. Old Country Rd. Hicksville, NY 11801	Nassau, Suffolk	516-934-8525	516-934-8557
<b>New York City</b> 75 Varick Street 7th Floor New York, NY 10013	Bronx, Kings, New York, Queens, Richmond, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester	212-775-3354	212-775-3507
<b>Albany</b> State Office Campus Bldg. 12, Room 288 Albany, NY 12240	Albany, Clinton, Columbia, Essex, Franklin, Fulton, Greene, Hamilton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, Warren, Washington, Dutchess	518-457-7745	518-458-5057
<b>Binghamton</b> Glendale Technology Park 2001 Perimeter Road East Suite 3 Endicott, NY 13760	Broome, Chemung, Chenango, Delaware, Otsego, Schuyler, Steuben, Tompkins, Tioga	607-741-4577	607-741-4529
<b>Syracuse</b> 450 S. Salina Street, Room 203 Syracuse, NY 13202	Cayuga, Cortland, Jefferson, Lewis, Onondaga, Oswego, Herkimer, Madison, Oneida, St. Lawrence	315-479-3228	315-479-3217
<b>Rochester</b> 276 Waring Road Rochester, NY 14609	Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates	585-258-8885	585-258-8882
<b>Buffalo</b> 290 Main Street Room 213 Buffalo, NY 14202	Allegany, Cattaraugus, Chautauqua, Erie, Niagara	716-851-2726	716-851-2797

**PROTECT** *all Workers*  
**ASSIST** *the Unemployed*  
**CONNECT** *Employers and Workers*

The New York State Department of Labor is an Equal Opportunity Employer/Program.  
 Auxiliary aids and services are available upon request to individuals with disabilities.

[www.labor.ny.gov](http://www.labor.ny.gov)

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**New York State  
Department of Labor**

Governor W. Averell Harriman  
State Office Building Campus  
Albany, New York 12240

Andrew M. Cuomo  
Governor

Peter M. Rivera  
Commissioner of Labor

**MEETING NOTICE**

**NYS APPRENTICESHIP & TRAINING COUNCIL**

**Where:** Two Locations – Albany and New York City

New York State Department of Labor  
State Campus, Building 12 ([Map](#))  
Training Rooms D & E (1<sup>st</sup> Floor)  
Albany, New York 12240

**AND**

New York State Insurance Fund  
199 Church Street, Auditorium  
New York, New York 10007

**When:** Tuesday, December 4, 2012

**Time:** 1:00 P.M. – 4:00 P.M.

Under the State Open Meetings Law, the public is invited to participate in the above stated meeting as the NYS Apprenticeship and Training Council deliberates on apprenticeship matters. In an effort to save time and travel expenses for interested parties, the meeting will be held in Albany and New York City with a video conference connection. The Council meeting will also be available via a delayed webcast and will be posted within approximately four (4) business days following the meeting on the New York State Department of Labor (NYSDOL) website at [www.labor.ny.gov](http://www.labor.ny.gov).

**In order to avoid unnecessary delays in checking attendees in due to the time required for New York State Insurance Fund (NYSIF) personnel to create the necessary individualized badges for each attendee, and to expedite checking in attendees at both sites, those planning on attending are kindly asked to pre-register by contacting the NYSDOL Apprenticeship Training Unit by November 30, 2012 at (518) 457-6820 or e-mail [ATCO@labor.ny.gov](mailto:ATCO@labor.ny.gov) and indicate which location you plan to attend.**

While no one will be turned away for failing to pre-register, NYSIF will not make the facility available to us in the future if we do not substantially comply with this requirement.

**Attendees at the NYSIF should arrive no later than 12:30 P.M. in order to pass through security. All attendees are reminded that both the NYSDOL and the NYSIF require photo identification to present to security upon entering the buildings.** Buildings are handicapped accessible.

For the Albany location, parking is only available in "N Lot" at the Department of Labor.

If you would prefer to receive future meeting notices via e-mail, rather than hard copy, please e-mail us at [ATCO@labor.ny.gov](mailto:ATCO@labor.ny.gov) indicating your name, agency and e-mail address and we will add your e-mail address to our electronic mailing list.

# Department of Purchasing

Paul Brennan, CPPB, CPM, Director

Rockland County, NY

## COUNTY OF ROCKLAND DEPARTMENT OF GENERAL SERVICES PURCHASING DIVISION

EFFECTIVE JUNE 27, 2003  
(Revised April 15, 2004)

RULES AND REGULATIONS  
Local Law No. 5 of 2003

### APPRENTICESHIP TRAINING PROGRAMS FOR CONSTRUCTION CONTRACTS

#### **Purpose**

The purpose of these rules and regulations is to implement Local Law No. 5 of 2003 requiring Apprenticeship Training Programs on construction contracts in excess of \$250,000. The legislative intent of Local Law No. 5 is to promote apprenticeship training as authorized by Section 816-b of the New York Labor Law.

#### **Definitions**

**"Alteration"** – the process of improving real property that adds value to its permanent value and prolongs its intended life appreciably; does not include routine repair, operation, or maintenance of existing real property.

**"Apprenticeship Agreement"** shall be as defined in New York State Labor Law Article 23.

**"Construction contract"** shall mean any contract to which the county of Rockland shall be a signatory which involves the construction, reconstruction, improvement, rehabilitation, installation, alteration, renovation, demolition or otherwise providing for any building, facility, or physical structure of any kind with a value in excess of \$250,000.

**"Construction"** – the process of building, altering, improving, or demolishing any public structure or building, or other public improvement of any kind to any public real property; does not include routine repair, operation, or maintenance of existing real property.

**"Contractor or subcontractor"** shall mean a contractor or subcontractor, which directly employs labor under a construction contract for which an apprenticeship program has been approved by the New York State Commissioner of Labor in accordance with Article 23 of the New York Labor Law.

**"Demolition"** – the process of taking down or removing a facility or physical structure from real property; does not include routine repair, operation, or maintenance of existing real property.

**"Improvement"** – the process of alteration or renovation of real property that adds value to its permanent value and prolongs its intended life appreciably; does not include routine repair, operation, or maintenance of existing real property.

**"Installation"** – the process of installing material and equipment in relation to a construction contract as defined above; does not include routine repair, operation, or maintenance of existing real property.



**"Maintenance and Repair"** shall mean the upkeep of real property that neither adds to its permanent value nor prolongs its intended life appreciably, but instead keeps it in an efficient operating condition.

**"Physical Structure"** – shall be defined as buildings, garages, shelters, and bridges.

**"Real Property"** is the land and its permanently affixed buildings and structures.

**"Reconstruction"** – the process of rebuilding, altering, improving, or demolishing any public structure or building, or other public improvement of any kind to any public real property; does not include routine repair, operation, or maintenance of existing real property.

**"Rehabilitation"** – the process of reconstruction, improvement, alteration, installation, or renovation of real property that adds value to its permanent value and prolongs its intended life appreciably; does not include routine repair, operation, or maintenance of existing real property.

**"Renovation"** – the process of reconstruction, improvement, installation and alteration of real property that adds value to its permanent value and prolongs its intended life appreciably; does not include routine repair, operation, or maintenance of existing real property.

#### **Effective Date**

These rules and regulations shall take effect for all County of Rockland Bid Solicitations for construction contracts issued on or after June 27, 2003.

#### **Application**

These rules and regulations shall apply to all County of Rockland construction contracts in excess of \$250,000.

These rules and regulations shall apply to all subcontractors that are entitled to receive in excess of \$25,000 from a County of Rockland construction contract.

These rules and regulation shall not apply to contracts for the routine repair, operation, or maintenance of existing real property.

These rules and regulations shall not apply to contracts for the routine repair, operation, or maintenance of County owned streams.

These rules and regulation shall not apply to professional service contracts associated with a County of Rockland construction contract.

These rules and regulations shall not apply to subcontractors providing only materials, supplies and equipment to a prime contractor.

These rules and regulations shall not apply to contracts or subcontracts for the purchase, delivery and installation of furnishings, furniture and office equipment in relation to a construction contract.

These rules and regulations shall not apply to materials and services purchased under New York State Contracts. The terms and conditions stated in the Office of General Services contract shall apply.

These rules and regulations shall not apply to projects financed through Federal/State Grants and NYS Revolving Fund financing which require M/WBE participation programs.

These rules and regulations shall not apply to sewer line construction projects and highway road and culvert projects.

These rules and regulations shall not apply to highway projects that receive federal aid or when the New York State Department of Transportation has concluded that the provisions of Local Law No. 5 could restrict competition.

These rules and regulations shall not apply to heavy non-building construction projects including athletic fields, dams, dikes, docks, drainage projects, golf courses, harbors, parks, reservoirs, canals, sewage treatment plants, water treatment plants, hydroelectric plants and other mass transit projects.

These rules and regulations may not apply to certain contracts that involve the expenditure of federal assistance or contract funds. In this case, the Department Head of the contracting agency and the Director of Purchasing shall make a written determination as to the reason(s); these rules and regulations, and Local Law No. 5 of 2003 does not apply regarding that specific contract.

Original Contract Amount – The County will utilize the Bid Price or Initial Contract amount by Trade to determine the applicability of Local No. 5 of 2003.

These rules and regulations shall not apply to Construction contracts in which the original Bid Price or Initial Contract amount is \$250,000 or less, but where the final contract amount is in excess of \$250,000 due to field change orders.

#### **Required Contractor Certification of Compliance**

Contractors shall be required to submit, with each bid proposal in excess of \$250,000, a notarized Certification of Compliance with Local Law No. 5 of 2003 form. As part of this certification, the contractor shall attach and submit proof of apprenticeship agreements from the New York State Commissioner of Labor and/or Trade Unions for the type and scope of work to be performed.

#### **Required Subcontractor Certification of Compliance**

Contractors shall be required to submit, for each subcontractor receiving in excess of \$25,000, a notarized Certification of Compliance with Local Law No. 5 of 2003 form. As part of this certification, the subcontractor shall attach and submit proof of apprenticeship agreements from the New York State Commissioner of Labor and/or Trade Unions for the type and scope of work to be performed.

#### **Procedure for Review of Prime Contractors Certifications**

Prior to award, certification forms received in relation to a bid shall be reviewed for compliance by the county agency that issued the bid documents. Upon determination of compliance, a memorandum stating that the bidder(s) to be awarded a contract(s) have met the requirements of Local Law No. 5 of 2003 shall be prepared and included in the permanent bid and contract file.

#### **Procedure for Review of Subcontractors Certifications**

Prior to a county agency approving the use of a subcontractor by a prime contractor; the county agency that issued the bid documents shall review the Certification of Compliance of Local Law No. 5 of 2003 form; for all proposed subcontractors. Upon determination of compliance, a memorandum stating that the subcontractor to be approved has met the requirements of Local Law No. 5 of 2003 shall be prepared and included in the permanent bid and contract file.

#### **Procedure for Requesting Waiver of Applicability**

Instances will arise in which a procedure to waive the applicability of Local Law No. 5 of 2003 will be in the best interest of the County. In this case the Department Head of the County agency that will be issuing the bidding documents or a Contractor shall document in writing to the Director of Purchasing the reason(s) for requesting such a waiver.



Some examples to implement a waiver are as follows:

- A lack of availability or approved apprentice programs for a specific trade within the Hudson Valley.
- A lack of availability of apprentices in specific trades. A Contractor may apply for a waiver prior to the Bid Opening Date if there are no apprentices available. A Subcontractor may apply for a waiver prior to being approved by the County if there are no apprentices available.
- At the request of a county agency provided they have provided sufficient information to determine that it is in the best interest of the County to do so.
- Contracts in which there is a disproportionately high ratio of material costs to labor costs
- Participating contractors and subcontractors demonstrate a good faith effort to comply
- Other criteria the Purchasing Director deems appropriate, subject to prior review by the County Executive and County Legislature.

If, upon his review of the waiver request, the Purchasing Director determines that the request to waive the applicability of Local Law No. 5 of 2003 is in the best interests of the County; then the Director of Purchasing shall forward a resolution request to the County Executive for his review and approval; and if approved by the County Executive the resolution will be forwarded to the Legislature for appropriate action.

#### **Enforcement**

The Office of the Public Advocate shall handle all complaints regarding the application of Local Law No. 5 of 2003 and the enforcement of Local Law No. 5 of 2003.

## **Division 01**



SECTION 011000  
SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.

1.2 PROJECT INFORMATION

A. Project Identification: Contract 1 – Suffern WWTP Upgrades

1. Project Location: Village of Suffern

B. Owner: Village of Suffern

1. Owner's Representative: Charles Sawicki, Director of Public Works – (845) 357 - 2602.

C. Engineer: Delaware Engineering, D.P.C. – 28 Madison Ave Ext., Albany, NY 12203

1. Engineer Representative: Robert Flores, P.E. – (518) 452-1290, [rflores@delawareengineering.com](mailto:rflores@delawareengineering.com).

D. Project Coordinator for Multiple Contracts: The ENGINEER has been engaged by Owner to serve as Project coordinator.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. This work consists of a new headworks building and upgrades to the existing trickling filters.

B. Type of Contract:

1. Project will be constructed under coordinated, concurrent multiple contracts. See Section "Multiple Contract Summary" for a description of work included under each of the multiple contracts:
  - a. Contract #1G – General Construction

SECTION 011000  
SUMMARY

b. Contract #1E – Electrical Construction

1.4 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with operations performed by Owner. Owner operations need to be maintained during construction.

1.5 ACCESS TO SITE

- A. Use of Site: Limit use of Project site to areas within the highway right-of-way indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Driveways, Roads, Walkways and Entrances: Keep driveways and entrances serving private property clear and available to the public, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
    - a. Schedule Work to minimize use of driveways and entrances by construction operations.
    - b. Schedule Work to minimize space and time requirements for storage of materials and equipment on-site.
- B. Condition of Existing Work Site: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- 1. Maintain access to existing walkways, driveways, and other adjacent occupied or used facilities. Do not close or obstruct walkways, driveways, or other occupied or used facilities without written permission from property owner and approval of authorities having jurisdiction.
- 2. Notify any property owner not less than 72 hours in advance of activities that will affect their operations.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of NYSDOT, Owner, and public streets and with other requirements of authorities having jurisdiction. If DOT road involved
- B. On-Site Work Hours: Limit work to daytime working hours of 7:00 a.m. to 4:00 p.m., Monday through Friday, unless otherwise indicated.

SECTION 011000  
SUMMARY

1. Weekend Hours: As approved by Owner and Engineer.
- A. Existing Utility Interruptions: Do not interrupt any services and or operations of any utilities serving facilities occupied or owned by Owner or others unless permitted under the following conditions and then only after providing temporary utilities/services according to requirements indicated:
  1. Notify Engineer and Owner not less than three days in advance of proposed interruptions.
  2. Obtain Engineer's and Owner's written permission before proceeding with any interruptions.
- B. Restricted Substances: Use of tobacco products and other controlled substances within the work area is not permitted.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 011000  
SUMMARY

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SECTION 011200  
MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.
- C. Related Requirements:
  - 1. Section 011000 "Summary" for the Work covered by the Contract Documents, restrictions on use of Project site, coordination with occupants, and work restrictions.

1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Engineer, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight; and openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.3 PROJECT COORDINATOR

- A. Project coordinator (Engineer) shall be responsible for coordination between the General Construction Contract and Electrical Contract

1.4 PROJECT COORDINATOR RESPONSIBILITIES

- A. Project coordinator shall perform Project coordination activities for the multiple contracts, including, but not limited to, the following:
  - 1. Provide typical overall coordination of the Work.
  - 2. Coordinate shared access to workspaces.
  - 3. Coordinate product selections for compatibility.
  - 4. Provide overall coordination of temporary facilities and controls.
  - 5. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
  - 6. Coordinate construction and operations of the Work with work performed by each Contract.
  - 7. Coordinate preparation of Project Record Documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.



SECTION 011200  
MULTIPLE CONTRACT SUMMARY

1.5 GENERAL REQUIREMENTS OF CONTRACTS

- A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.
1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
  2. Trenches and other excavation for the work of each contract shall be the work of each contract for its own work.
  3. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of each contract for its own work.
  4. Equipment pads for the work of each contract shall be the work of each contract for its own work.
  5. Painting for the work of each contract shall be the work of each contract for its own work.
  6. Cutting and Patching: Each contract shall perform its own cutting; patching shall be each contract for its own work.
  7. Through-penetration firestopping for the work of each contract shall be provided by each contract for its own work.
  8. Contractors' Startup Construction Schedule: Within five working days after startup horizontal bar-chart-type construction schedule submittal has been received from Project coordinator, submit a matching startup horizontal bar-chart schedule showing construction operations sequenced and coordinated with overall construction.
- B. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section each contractor is responsible for the following:
1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
  2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
  3. Staging and scaffolding for its own construction activities.
  4. General hoisting facilities for its own construction activities, up to 2 tons.
  5. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
  6. Progress cleaning of work areas affected by its operations on a daily basis.
  7. Secure lockup of its own tools, materials, and equipment.
  8. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- C. Temporary Heating, Cooling, and Ventilation: The General Construction Contract is responsible for temporary heating, cooling, and ventilation before weathertight enclosure of building is complete.
- D. Use Charges: Comply with the following:
1. Sewer Service: The use of Owner sewer services will be available to the Contractors at no cost.

SECTION 011200  
MULTIPLE CONTRACT SUMMARY

2. Water Service: The use of Owner water service will be available to the Contractors at no cost.
3. Electric Power Service: The use of Owner electric power will be available to the Contractors at no cost.

1.6 GENERAL CONSTRUCTION CONTRACT

A. Work of the General Construction Contract includes, but is not limited to, the following:

1. Remaining work not identified as work under other contracts.
2. Site preparation, including clearing, relocations, and earthwork.
3. Site improvements, including roadways, parking lots, pedestrian paving, site development furnishings and equipment, and landscaping.
4. Selective demolition.
5. Removal of existing equipment, piping, equipment pads.
6. Foundations, including footings, foundation walls.
7. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
8. Below-grade building construction, including excavation, backfill, and insulation and waterproofing/damp proofing.
9. Superstructure, including floor and roof construction.
10. Exterior closure, including walls, doors, windows.
11. Roofing, including roof insulation, coverings, flashings roof specialties and roof accessories.
12. Interior construction, including partitions, doors, interior glazed openings, and fittings.
13. Fire-protection specialties.
14. Stairs, including railings and finishes.
15. Interior finishes, finish carpentry, interior specialties, and floor and ceiling finishes.
16. Interior and exterior painting of building areas and process piping, and conduits.
17. Miscellaneous items, painting of mechanical and electrical work.
18. Conveying systems such as cranes.
19. Mechanical piping, valves, and supports.
20. Concrete pads for equipment and control panels
21. Mounting control panels
22. Coordinate installation of unit heaters
23. Rough openings for fans and louvers
24. Routing of manufacturer provided power and control cables
25. Terminating control and instrumentation wires at the control panels.
26. Cleaning wastewater tanks as needed to perform work.
27. Sludge disposal.
28. Mold removal as needed to perform work.
29. Removal of blowers, grinders, and other equipment.
30. Equipment, including the following:
  - a. Mechanical Screens and washer compactors with control panel
  - b. Grit removal, Grit pump, Grit classifier
  - c. Parshall flume
  - d. Slide gates
  - e. Carbon odor control system
  - f. Trickling filter media and upgrades
  - g. SCADA equipment, fiber cables, and instrumentation

SECTION 011200  
MULTIPLE CONTRACT SUMMARY

- B. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:
1. Temporary facilities and controls that are not otherwise specifically assigned to the other Contracts.
  2. Sediment and erosion control.
  3. Unpiped sewers and drainage, including drainage ditches, dry wells, stabilization ponds, and containers.
  4. Stormwater control.
  5. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
  6. Temporary enclosure for building exterior, except as indicated.
  7. Excavation support and protection, unless required solely for the Work of another contract.
  8. Special or unusual hoisting requirements for construction activities, including hoisting loads in excess of 2 tons, hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
  9. Project identification and temporary signs.
  10. General waste disposal facilities.
  11. Pest control.
  12. Temporary stairs.
  13. Barricades, warning signs, and lights.
  14. Site enclosure fence.
  15. Security enclosure and lockup.
  16. Environmental protection.
  17. Maintenance and restoration of Owner's existing facilities used as temporary facilities.

1.7 ELECTRICAL CONTRACT

- A. Work of the Electrical Contract includes, but is not limited to, the following:
1. All power panels.
  2. All disconnects.
  3. All power and control conduit and wire.
  4. Trenching for power and control conduit where needed.
  5. Termination of power supply and control signals to equipment and equipment panels supplied by other Contracts.
  6. Building and site lighting
  7. Outlets
  8. Wall mounting of power panels, transformers, and other equipment supplied by the Electrical Contractor.
  9. Power and control conduit and conductors to Instrumentation
- B. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:
1. Electric power service and distribution.
  2. Lighting, including site lighting.
  3. Electrical connections to existing systems and temporary facilities and controls furnished by the General Construction Contract.

SECTION 011200  
MULTIPLE CONTRACT SUMMARY

1.8 HVAC CONTRACT

- A. Work of the HVAC Contract includes, but is not limited to, the following:
  - 1. Providing unit heaters for headworks building
  - 2. Providing fans and louvers for headworks building
  - 3. Controls and start-up
- B. Temporary facilities and controls in the HVAC Contract include, but are not limited to, the following:
  - 1. Temporary heat

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011200

SECTION 011200  
MULTIPLE CONTRACT SUMMARY

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SECTION 012100  
ALLOWANCES

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
  - 1. Contingency allowances.

1.2 DEFINITIONS

- A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

SECTION 012100  
ALLOWANCES

1.6 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Engineer for Owner's purposes and only by work directives that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Work directives authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.7 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
  - 2. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
  - 3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

SECTION 012100  
ALLOWANCES

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1G Contingency Allowance: Include a contingency allowance of \$75,000.00 for use according to Engineer's written instructions.
- B. Allowance No. 2G Contingency Allowance: Include a contingency allowance of \$25,000.00 for sludge disposal and other use according to Engineer's written instructions.
- C. Allowance No. 1E Contingency Allowance: Include a contingency allowance of \$25,000.00 for use according to Engineer's written instructions.
- D. Allowance No. 1H Contingency Allowance: Include a contingency allowance of \$10,000.00 for use according to Engineer's written instructions.

END OF SECTION 012100



SECTION 012100  
ALLOWANCES

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SECTION 013050  
CONSTRUCTION SEQUENCING

PART 1            GENERAL

1.1      WORK INCLUDED

- A. The Wastewater Treatment Plant will continue to operate during execution of this Contract 24 hours per day, 7 days per week. Normal operating hours for the administration areas is 7:00 AM to 3:00 PM.
- B. Demolition of existing facilities and construction of new facilities must be scheduled so as not to interrupt to plant operations. Plant operations includes all processes, equipment, power and controls necessary to maintain compliance with the facility's SPDES permit.
- C. Coordination between the all prime contractors and their sub-contractors is a requirement of this project. This coordination is necessary in several areas to insure uninterrupted operations of the WWTP. All contractors shall coordinate scheduling through the Engineer and Owner and the General Contractor will be the lead.
- D. Except where specifically noted below, prime contractors are responsible for providing all temporary facilities required to maintain plant operation during the execution of this contract. The prime contractors shall provide a detailed construction sequence plan, including a schedule, covering the specific work tasks described below and any and all other tasks that may affect plant operations to the Engineer prior to starting any work on this project.
- E. All contractors will be required to attend scheduled construction meetings to discuss and resolve critical items.
- F. The Contractor shall provide the Engineer with a minimum of 1 week notice of their intent to place any new structure or piece of equipment into operation.
- G. No equipment shall be placed into temporary or permanent operation without prior approval of the Engineer. All equipment shall be placed into operation in the presence of a manufacturers' designated representative.
- H. The Contractor shall include sufficient time in all construction sequencing to properly clean existing structures prior to initiating work.
- I. The General Contractor shall be responsible for preparation of an overall construction schedule for the WWTP. The schedule shall allow for sufficient time to complete all tasks required by each Prime Contractor and their subcontractors. The schedule will be reviewed by all Prime Contractors for verification of sufficient time to complete all tasks. The schedule will be subject to the approval of the Owner and Engineer and shall meet all the time frames outlined in the contract documents.
- J. The General Contractor shall be responsible for maintaining the existing plant flows during the construction. bypass pumping required within the WWTP as required to maintain these flows will be vary in duration. The General Contractor is responsible for any required bypass pumping.
- K. The General Contractor will be responsible for draining existing tanks at the WWTP as required for contractor access. The General Contractor will be responsible for final cleaning / pressure washing of the tanks as required to complete their work. Any costs associated with the removal of grit / solid accumulation (defined as materials that cannot be transferred to another tank via a pump and requires removal via a vacuum truck or other mechanical means) will be paid via the allowance.

1.2      WWTP GENERAL SEQUENCE OF CONSTRUCTION

- A. The WWTP will operate in the following the temporary construction process during the Work. Note that this is not a complete list but only to serve as a guideline for establishing a basis for maintaining plant operations.
  - 1.            See Drawing C-005.

PART 2            PRODUCTS

SECTION 013050  
CONSTRUCTION SEQUENCING

Not Used

PART 3

Not Used

EXECUTION

END OF SECTION

SECTION 013100  
PROJECT MANAGEMENT AND COORDINATION

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures
  - 2. Coordination drawings
  - 3. RFIs
  - 4. Digital project management procedures
  - 5. Project meetings
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

SECTION 013100  
PROJECT MANAGEMENT AND COORDINATION

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall cooperate with Project coordinator who shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors and direction of Project coordinator to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of 3 week look ahead schedule.
  - 3. Preparation of the schedule of values.
  - 4. Installation and removal of temporary facilities and controls.
  - 5. Delivery and processing of submittals.
  - 6. Progress meetings.
  - 7. Preinstallation conferences.
  - 8. Project closeout activities.
  - 9. Startup and adjustment of systems.

SECTION 013100  
PROJECT MANAGEMENT AND COORDINATION

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of Architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show Architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate subframing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:

SECTION 013100  
PROJECT MANAGEMENT AND COORDINATION

- a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
  - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
  - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
- a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
  - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
  - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
  - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
- a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Engineer will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Engineer determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Engineer will so inform Contractor, who shall make suitable modifications and resubmit.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
- 1. Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.
  - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Engineer.
- 1. Attachments shall be electronic files in PDF format.
- C. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
- 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.

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- c. Requests for approval of Contractor's means and methods.
  - d. Requests for coordination information already indicated in the Contract Documents.
  - e. Requests for adjustments in the Contract Time or the Contract Sum.
  - f. Requests for interpretation of Engineer's actions on submittals.
  - g. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt by Engineer of additional information.
  - 3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within five days of the meeting.
- B. Preconstruction Conference: Engineer will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Responsibilities and personnel assignments.
    - b. Tentative construction schedule.
    - c. Phasing.
    - d. Critical work sequencing and long lead items.
    - e. Designation of key personnel and their duties.
    - f. Lines of communications.
    - g. Use of web-based Project software.
    - h. Procedures for processing field decisions and Change Orders.
    - i. Procedures for RFIs.



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PROJECT MANAGEMENT AND COORDINATION

- j. Procedures for testing and inspecting.
  - k. Procedures for processing Applications for Payment.
  - l. Distribution of the Contract Documents.
  - m. Submittal procedures.
  - n. Work restrictions.
  - o. Working hours.
  - p. Owner's occupancy requirements.
  - q. Responsibility for temporary facilities and controls.
  - r. Procedures for disruptions and shutdowns.
  - s. Construction waste management and recycling.
  - t. Parking availability.
  - u. Office, work, and storage areas.
  - v. Equipment deliveries and priorities.
  - w. First aid.
  - x. Security.
  - y. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Engineer will conduct progress meetings at regular intervals.
- 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- D. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
- 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

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PROJECT MANAGEMENT AND COORDINATION

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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PROJECT MANAGEMENT AND COORDINATION

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SECTION 013300  
SUBMITTAL PROCEDURES

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
  - 1. Submittal schedule requirements.
  - 2. Administrative and procedural requirements for submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
  - 3. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Name of subcontractor.
    - d. Description of the Work covered.
    - e. Scheduled date for Engineer's final release or approval.

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SUBMITTAL PROCEDURES

1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
  2. Date.
  3. Name of Engineer.
  4. Name of Contractor.
  5. Name of firm or entity that prepared submittal.
  6. Names of subcontractor, manufacturer, and supplier.
  7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
  8. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
  9. Drawing number and detail references, as appropriate.
  10. Indication of full or partial submittal.
  11. Location(s) where product is to be installed, as appropriate.
  12. Other necessary identification.
  13. Remarks.
  14. Signature of transmitter.
- B. Options: Identify options requiring selection by Engineer.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Engineer on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Email: Prepare submittals as PDF package, and transmit to Engineer by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Engineer.
    - a. Engineer will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
  2. Paper: Prepare submittals in paper form, and deliver to Engineer.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

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SUBMITTAL PROCEDURES

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 10 days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:

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- a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams that show factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- D. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- E. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

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2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

F. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - a. Name of evaluation organization.
  - b. Date of evaluation.
  - c. Time period when report is in effect.
  - d. Product and manufacturers' names.
  - e. Description of product.
  - f. Test procedures and results.
  - g. Limitations of use.



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SUBMITTAL PROCEDURES

1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
  - 1. Engineer will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 ENGINEER'S REVIEW

- A. Action Submittals: Engineer will review each submittal, indicate corrections or revisions required, and return it.
  - 1. PDF Submittals: Engineer will indicate, via markup on each submittal, the appropriate action.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.

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- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Engineer will discard submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Engineer without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

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SUBMITTAL PROCEDURES

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SECTION 014000  
QUALITY REQUIREMENTS

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
  - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of 5 previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

SECTION 014000  
QUALITY REQUIREMENTS

- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Engineer.

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

SECTION 014000  
QUALITY REQUIREMENTS

1.6 ACTION SUBMITTALS

- A. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
  - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
  - 2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

SECTION 014000  
QUALITY REQUIREMENTS

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Engineer. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including Subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
  - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Engineer has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, telephone number, and email address of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.

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QUALITY REQUIREMENTS

6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.



SECTION 014000  
QUALITY REQUIREMENTS

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.11 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Engage a qualified testing agency to perform quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

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3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- C. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform duties of Contractor.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.

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6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspection equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Engineer with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

- A. Determined upon review.

3.2 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
  2. Description of the Work tested or inspected.
  3. Date test or inspection results were transmitted to Engineer.
  4. Identification of testing agency or special inspector conducting test or inspection.

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- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.
  - 1. Submit log at Project closeout as part of Project Record Documents.

3.3 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

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REFERENCES

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
  - 1. AABC - Associated Air Balance Council; [www.aabc.com](http://www.aabc.com).
  - 2. AAMA - American Engineerural Manufacturers Association; [www.aamanet.org](http://www.aamanet.org).
  - 3. AAPFCO - Association of American Plant Food Control Officials; [www.aapfco.org](http://www.aapfco.org).
  - 4. AASHTO - American Association of State Highway and Transportation Officials; [www.transportation.org](http://www.transportation.org).
  - 5. AATCC - American Association of Textile Chemists and Colorists; [www.aatcc.org](http://www.aatcc.org).
  - 6. ABMA - American Bearing Manufacturers Association; [www.americanbearings.org](http://www.americanbearings.org).
  - 7. ABMA - American Boiler Manufacturers Association; [www.abma.com](http://www.abma.com).
  - 8. ACI - American Concrete Institute; (Formerly: ACI International); [www.concrete.org](http://www.concrete.org)
  - 9. ACPA - American Concrete Pipe Association; [www.concrete-pipe.org](http://www.concrete-pipe.org).
  - 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); [www.aeic.org](http://www.aeic.org).
  - 11. AF&PA - American Forest & Paper Association; [www.afandpa.org](http://www.afandpa.org).
  - 12. AGA - American Gas Association; [www.aga.org](http://www.aga.org).
  - 13. AHAM - Association of Home Appliance Manufacturers; [www.aham.org](http://www.aham.org).
  - 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); [www.ahrinet.org](http://www.ahrinet.org).
  - 15. AI - Asphalt Institute; [www.asphaltinstitute.org](http://www.asphaltinstitute.org).
  - 16. AIA - American Institute of Engineers (The); [www.aia.org](http://www.aia.org).
  - 17. AISC - American Institute of Steel Construction; [www.aisc.org](http://www.aisc.org).
  - 18. AISI - American Iron and Steel Institute; [www.steel.org](http://www.steel.org).
  - 19. AITC - American Institute of Timber Construction; [www.aitc-glulam.org](http://www.aitc-glulam.org).
  - 20. AMCA - Air Movement and Control Association International, Inc.; [www.amca.org](http://www.amca.org).
  - 21. ANSI - American National Standards Institute; [www.ansi.org](http://www.ansi.org).
  - 22. AOSA - Association of Official Seed Analysts, Inc.; [www.aosaseed.com](http://www.aosaseed.com).
  - 23. APA - APA - The Engineered Wood Association; [www.apawood.org](http://www.apawood.org).
  - 24. APA - Engineerural Precast Association; [www.archprecast.org](http://www.archprecast.org).
  - 25. API - American Petroleum Institute; [www.api.org](http://www.api.org).
  - 26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
  - 27. ARI - American Refrigeration Institute; (See AHRI).

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28. ARMA - Asphalt Roofing Manufacturers Association; [www.asphaltroofing.org](http://www.asphaltroofing.org).
29. ASCE - American Society of Civil Engineers; [www.asce.org](http://www.asce.org).
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; [www.ashrae.org](http://www.ashrae.org).
32. ASME - ASME International; (American Society of Mechanical Engineers); [www.asme.org](http://www.asme.org).
33. ASSE - American Society of Safety Engineers (The); [www.asse.org](http://www.asse.org).
34. ASSE - American Society of Sanitary Engineering; [www.asse-plumbing.org](http://www.asse-plumbing.org).
35. ASTM - ASTM International; [www.astm.org](http://www.astm.org).
36. ATIS - Alliance for Telecommunications Industry Solutions; [www.atis.org](http://www.atis.org).
37. AWEA - American Wind Energy Association; [www.awea.org](http://www.awea.org).
38. AWI - Engineerural Woodwork Institute; [www.awinet.org](http://www.awinet.org).
39. AWMAC - Engineerural Woodwork Manufacturers Association of Canada; [www.awmac.com](http://www.awmac.com).
40. AWPA - American Wood Protection Association; [www.awpa.com](http://www.awpa.com).
41. AWS - American Welding Society; [www.aws.org](http://www.aws.org).
42. AWWA - American Water Works Association; [www.awwa.org](http://www.awwa.org).
43. BHMA - Builders Hardware Manufacturers Association; [www.buildershardware.com](http://www.buildershardware.com).
44. BIA - Brick Industry Association (The); [www.gobrick.com](http://www.gobrick.com).
45. BICSI - BICSI, Inc.; [www.bicsi.org](http://www.bicsi.org).
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); [www.bifma.org](http://www.bifma.org).
47. BISSC - Baking Industry Sanitation Standards Committee; [www.bissc.org](http://www.bissc.org).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); [www.bissc.org](http://www.bissc.org).
49. CDA - Copper Development Association; [www.copper.org](http://www.copper.org).
50. CE - Conformite Europeenne; <http://ec.europa.eu/growth/single-market/ce-marking/>
51. CEA - Canadian Electricity Association; [www.electricity.ca](http://www.electricity.ca).
52. CEA - Consumer Electronics Association; [www.ce.org](http://www.ce.org).
53. CFFA - Chemical Fabrics and Film Association, Inc.; [www.chemicalfabricsandfilm.com](http://www.chemicalfabricsandfilm.com).
54. CFSEI - Cold-Formed Steel Engineers Institute; [www.cfsei.org](http://www.cfsei.org).
55. CGA - Compressed Gas Association; [www.cganet.com](http://www.cganet.com).
56. CIMA - Cellulose Insulation Manufacturers Association; [www.cellulose.org](http://www.cellulose.org).
57. CISCA - Ceilings & Interior Systems Construction Association; [www.cisca.org](http://www.cisca.org).
58. CISPI - Cast Iron Soil Pipe Institute; [www.cispi.org](http://www.cispi.org).
59. CLFMI - Chain Link Fence Manufacturers Institute; [www.chainlinkinfo.org](http://www.chainlinkinfo.org).
60. CPA - Composite Panel Association; [www.pbmdf.com](http://www.pbmdf.com).
61. CRI - Carpet and Rug Institute (The); [www.carpet-rug.org](http://www.carpet-rug.org).
62. CRRC - Cool Roof Rating Council; [www.coolroofs.org](http://www.coolroofs.org).
63. CRSI - Concrete Reinforcing Steel Institute; [www.crsi.org](http://www.crsi.org).
64. CSA - Canadian Standards Association; [www.csa.ca](http://www.csa.ca).
65. CSA - CSA International; (Formerly: IAS - International Approval Services); [www.csa-international.org](http://www.csa-international.org).
66. CSI - Construction Specifications Institute (The); [www.csinet.org](http://www.csinet.org).
67. CSSB - Cedar Shake & Shingle Bureau; [www.cedarbureau.org](http://www.cedarbureau.org).
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); [www.cti.org](http://www.cti.org).
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; [www.dasma.com](http://www.dasma.com).
71. DHI - Door and Hardware Institute; [www.dhi.org](http://www.dhi.org).



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72. ECA - Electronic Components Association; (See ECIA).
73. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
74. ECIA - Electronic Components Industry Association; [www.eciaonline.org](http://www.eciaonline.org).
75. EIA - Electronic Industries Alliance; (See TIA).
76. EIMA - EIFS Industry Members Association; [www.eima.com](http://www.eima.com).
77. EJMA - Expansion Joint Manufacturers Association, Inc.; [www.ejma.org](http://www.ejma.org).
78. ESD - ESD Association; (Electrostatic Discharge Association); [www.esda.org](http://www.esda.org).
79. ESTA - Entertainment Services and Technology Association; (See PLASA).
80. ETL - Intertek (See Intertek); [www.intertek.com](http://www.intertek.com).
81. EVO - Efficiency Valuation Organization; [www.evo-world.org](http://www.evo-world.org).
82. FCI - Fluid Controls Institute; [www.fluidcontrolsintstitute.org](http://www.fluidcontrolsintstitute.org).
83. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); [www.fiba.com](http://www.fiba.com).
84. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); [www.fivb.org](http://www.fivb.org).
85. FM Approvals - FM Approvals LLC; [www.fmglobal.com](http://www.fmglobal.com).
86. FM Global - FM Global; (Formerly: FMG - FM Global); [www.fmglobal.com](http://www.fmglobal.com).
87. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; [www.floridarroof.com](http://www.floridarroof.com).
88. FSA - Fluid Sealing Association; [www.fluidsealing.com](http://www.fluidsealing.com).
89. FSC - Forest Stewardship Council U.S.; [www.fscus.org](http://www.fscus.org).
90. GA - Gypsum Association; [www.gypsum.org](http://www.gypsum.org).
91. GANA - Glass Association of North America; [www.glasswebsite.com](http://www.glasswebsite.com).
92. GS - Green Seal; [www.greenseal.org](http://www.greenseal.org).
93. HI - Hydraulic Institute; [www.pumps.org](http://www.pumps.org).
94. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
95. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
96. HPVA - Hardwood Plywood & Veneer Association; [www.hpva.org](http://www.hpva.org).
97. HPW - H. P. White Laboratory, Inc.; [www.hpwhite.com](http://www.hpwhite.com).
98. IAPSC - International Association of Professional Security Consultants; [www.iapsc.org](http://www.iapsc.org).
99. IAS - International Accreditation Service; [www.iasonline.org](http://www.iasonline.org).
100. IAS - International Approval Services; (See CSA).
101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
103. ICEA - Insulated Cable Engineers Association, Inc.; [www.icea.net](http://www.icea.net).
104. ICPA - International Cast Polymer Alliance; [www.icpa-hq.org](http://www.icpa-hq.org).
105. ICRI - International Concrete Repair Institute, Inc.; [www.icri.org](http://www.icri.org).
106. IEC - International Electrotechnical Commission; [www.iec.ch](http://www.iec.ch).
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); [www.ieee.org](http://www.ieee.org).
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); [www.ies.org](http://www.ies.org).
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; [www.iest.org](http://www.iest.org).
111. IGMA - Insulating Glass Manufacturers Alliance; [www.igmaonline.org](http://www.igmaonline.org).
112. IGSHPA - International Ground Source Heat Pump Association; [www.igshpa.okstate.edu](http://www.igshpa.okstate.edu).
113. ILI - Indiana Limestone Institute of America, Inc.; [www.iliai.com](http://www.iliai.com).
114. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); [www.intertek.com](http://www.intertek.com).
115. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); [www.isa.org](http://www.isa.org).

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116. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
117. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); [www.isfanow.org](http://www.isfanow.org).
118. ISO - International Organization for Standardization; [www.iso.org](http://www.iso.org).
119. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
120. ITU - International Telecommunication Union; [www.itu.int/home](http://www.itu.int/home).
121. KCMA - Kitchen Cabinet Manufacturers Association; [www.kcma.org](http://www.kcma.org).
122. LMA - Laminating Materials Association; (See CPA).
123. LPI - Lightning Protection Institute; [www.lightning.org](http://www.lightning.org).
124. MBMA - Metal Building Manufacturers Association; [www.mbma.com](http://www.mbma.com).
125. MCA - Metal Construction Association; [www.metalconstruction.org](http://www.metalconstruction.org).
126. MFMA - Maple Flooring Manufacturers Association, Inc.; [www.maplefloor.org](http://www.maplefloor.org).
127. MFMA - Metal Framing Manufacturers Association, Inc.; [www.metalframingmfg.org](http://www.metalframingmfg.org).
128. MHIA - Material Handling Industry of America; [www.mhia.org](http://www.mhia.org).
129. MIA - Marble Institute of America; [www.marble-institute.com](http://www.marble-institute.com).
130. MMPA - Moulding & Millwork Producers Association; [www.wmmpa.com](http://www.wmmpa.com).
131. MPI - Master Painters Institute; [www.paintinfo.com](http://www.paintinfo.com).
132. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; [www.mss-hq.org](http://www.mss-hq.org).
133. NAAMM - National Association of Engineerural Metal Manufacturers; [www.naamm.org](http://www.naamm.org).
134. NACE - NACE International; (National Association of Corrosion Engineers International); [www.nace.org](http://www.nace.org).
135. NADCA - National Air Duct Cleaners Association; [www.nadca.com](http://www.nadca.com).
136. NAIMA - North American Insulation Manufacturers Association; [www.naima.org](http://www.naima.org).
137. NBGQA - National Building Granite Quarries Association, Inc.; [www.nbgqa.com](http://www.nbgqa.com).
138. NBI - New Buildings Institute; [www.newbuildings.org](http://www.newbuildings.org).
139. NCAA - National Collegiate Athletic Association (The); [www.ncaa.org](http://www.ncaa.org).
140. NCMA - National Concrete Masonry Association; [www.ncma.org](http://www.ncma.org).
141. NEBB - National Environmental Balancing Bureau; [www.nebb.org](http://www.nebb.org).
142. NECA - National Electrical Contractors Association; [www.necanet.org](http://www.necanet.org).
143. NeLMA - Northeastern Lumber Manufacturers Association; [www.nelma.org](http://www.nelma.org).
144. NEMA - National Electrical Manufacturers Association; [www.nema.org](http://www.nema.org).
145. NETA - InterNational Electrical Testing Association; [www.netaworld.org](http://www.netaworld.org).
146. NFHS - National Federation of State High School Associations; [www.nfhs.org](http://www.nfhs.org).
147. NFPA - National Fire Protection Association; [www.nfpa.org](http://www.nfpa.org).
148. NFPA - NFPA International; (See NFPA).
149. NFRC - National Fenestration Rating Council; [www.nfrc.org](http://www.nfrc.org).
150. NHLA - National Hardwood Lumber Association; [www.nhla.com](http://www.nhla.com).
151. NLGA - National Lumber Grades Authority; [www.nlga.org](http://www.nlga.org).
152. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
153. NOMMA - National Ornamental & Miscellaneous Metals Association; [www.nomma.org](http://www.nomma.org).
154. NRCA - National Roofing Contractors Association; [www.nrca.net](http://www.nrca.net).
155. NRMCA - National Ready Mixed Concrete Association; [www.nrmca.org](http://www.nrmca.org).
156. NSF - NSF International; [www.nsf.org](http://www.nsf.org).
157. NSPE - National Society of Professional Engineers; [www.nspe.org](http://www.nspe.org).
158. NSSGA - National Stone, Sand & Gravel Association; [www.nssga.org](http://www.nssga.org).
159. NTMA - National Terrazzo & Mosaic Association, Inc. (The); [www.ntma.com](http://www.ntma.com).
160. NWFA - National Wood Flooring Association; [www.nwfa.org](http://www.nwfa.org).
161. PCI - Precast/Prestressed Concrete Institute; [www.pci.org](http://www.pci.org).
162. PDI - Plumbing & Drainage Institute; [www.pdionline.org](http://www.pdionline.org).

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163. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); <http://www.plasa.org>.
164. RCSC - Research Council on Structural Connections; [www.boltcouncil.org](http://www.boltcouncil.org).
165. RFCI - Resilient Floor Covering Institute; [www.rfci.com](http://www.rfci.com).
166. RIS - Redwood Inspection Service; [www.redwoodinspection.com](http://www.redwoodinspection.com).
167. SAE - SAE International; [www.sae.org](http://www.sae.org).
168. SCTE - Society of Cable Telecommunications Engineers; [www.scte.org](http://www.scte.org).
169. SDI - Steel Deck Institute; [www.sdi.org](http://www.sdi.org).
170. SDI - Steel Door Institute; [www.steeldoor.org](http://www.steeldoor.org).
171. SEFA - Scientific Equipment and Furniture Association (The); [www.sefalabs.com](http://www.sefalabs.com).
172. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
173. SIA - Security Industry Association; [www.siaonline.org](http://www.siaonline.org).
174. SJI - Steel Joist Institute; [www.steeljoist.org](http://www.steeljoist.org).
175. SMA - Screen Manufacturers Association; [www.smainfo.org](http://www.smainfo.org).
176. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; [www.smacna.org](http://www.smacna.org).
177. SMPTE - Society of Motion Picture and Television Engineers; [www.smpte.org](http://www.smpte.org).
178. SPFA - Spray Polyurethane Foam Alliance; [www.sprayfoam.org](http://www.sprayfoam.org).
179. SPIB - Southern Pine Inspection Bureau; [www.spib.org](http://www.spib.org).
180. SPRI - Single Ply Roofing Industry; [www.spri.org](http://www.spri.org).
181. SRCC - Solar Rating & Certification Corporation; [www.solar-rating.org](http://www.solar-rating.org).
182. SSINA - Specialty Steel Industry of North America; [www.ssina.com](http://www.ssina.com).
183. SSPC - SSPC: The Society for Protective Coatings; [www.sspc.org](http://www.sspc.org).
184. STI - Steel Tank Institute; [www.steeltank.com](http://www.steeltank.com).
185. SWI - Steel Window Institute; [www.steelwindows.com](http://www.steelwindows.com).
186. SWPA - Submersible Wastewater Pump Association; [www.swpa.org](http://www.swpa.org).
187. TCA - Tilt-Up Concrete Association; [www.tilt-up.org](http://www.tilt-up.org).
188. TCNA - Tile Council of North America, Inc.; [www.tileusa.com](http://www.tileusa.com).
189. TEMA - Tubular Exchanger Manufacturers Association, Inc.; [www.tema.org](http://www.tema.org).
190. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); [www.tiaonline.org](http://www.tiaonline.org).
191. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
192. TMS - The Masonry Society; [www.masonrysociety.org](http://www.masonrysociety.org).
193. TPI - Truss Plate Institute; [www.tpinst.org](http://www.tpinst.org).
194. TPI - Turfgrass Producers International; [www.turfgrasssod.org](http://www.turfgrasssod.org).
195. TRI - Tile Roofing Institute; [www.tilerroofing.org](http://www.tilerroofing.org).
196. UL - Underwriters Laboratories Inc.; <http://www.ul.com>.
197. UNI - Uni-Bell PVC Pipe Association; [www.uni-bell.org](http://www.uni-bell.org).
198. USAV - USA Volleyball; [www.usavolleyball.org](http://www.usavolleyball.org).
199. USGBC - U.S. Green Building Council; [www.usgbc.org](http://www.usgbc.org).
200. USITT - United States Institute for Theatre Technology, Inc.; [www.usitt.org](http://www.usitt.org).
201. WASTEC - Waste Equipment Technology Association; [www.wastec.org](http://www.wastec.org).
202. WCLIB - West Coast Lumber Inspection Bureau; [www.wclib.org](http://www.wclib.org).
203. WCMA - Window Covering Manufacturers Association; [www.wcmanet.org](http://www.wcmanet.org).
204. WDMA - Window & Door Manufacturers Association; [www.wdma.com](http://www.wdma.com).
205. WI - Woodwork Institute; [www.wicnet.org](http://www.wicnet.org).
206. WSRCA - Western States Roofing Contractors Association; [www.wsrca.com](http://www.wsrca.com).
207. WWPA - Western Wood Products Association; [www.wwpa.org](http://www.wwpa.org).

SECTION 014200  
REFERENCES

- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. DIN - Deutsches Institut fur Normung e.V.; [www.din.de](http://www.din.de).
  2. IAPMO - International Association of Plumbing and Mechanical Officials; [www.iapmo.org](http://www.iapmo.org).
  3. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
  4. ICC-ES - ICC Evaluation Service, LLC; [www.icc-es.org](http://www.icc-es.org).
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; [www.usace.army.mil](http://www.usace.army.mil).
  2. CPSC - Consumer Product Safety Commission; [www.cpsc.gov](http://www.cpsc.gov).
  3. DOC - Department of Commerce; National Institute of Standards and Technology; [www.nist.gov](http://www.nist.gov).
  4. DOD - Department of Defense; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
  5. DOE - Department of Energy; [www.energy.gov](http://www.energy.gov).
  6. EPA - Environmental Protection Agency; [www.epa.gov](http://www.epa.gov).
  7. FAA - Federal Aviation Administration; [www.faa.gov](http://www.faa.gov).
  8. FG - Federal Government Publications; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).
  9. GSA - General Services Administration; [www.gsa.gov](http://www.gsa.gov).
  10. HUD - Department of Housing and Urban Development; [www.hud.gov](http://www.hud.gov).
  11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; [www.eetd.lbl.gov](http://www.eetd.lbl.gov).
  12. OSHA - Occupational Safety & Health Administration; [www.osha.gov](http://www.osha.gov).
  13. SD - Department of State; [www.state.gov](http://www.state.gov).
  14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; [www.trb.org](http://www.trb.org).
  15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; [www.ars.usda.gov](http://www.ars.usda.gov).
  16. USDA - Department of Agriculture; Rural Utilities Service; [www.usda.gov](http://www.usda.gov).
  17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; [www.ojp.usdoj.gov](http://www.ojp.usdoj.gov).
  18. USP - U.S. Pharmacopeial Convention; [www.usp.org](http://www.usp.org).
  19. USPS - United States Postal Service; [www.usps.com](http://www.usps.com).
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).
  2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
  3. DSCC - Defense Supply Center Columbus; (See FS).
  4. FED-STD - Federal Standard; (See FS).

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REFERENCES

5. FS - Federal Specification; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
    - a. Available from Defense Standardization Program; [www.dsp.dla.mil](http://www.dsp.dla.mil).
    - b. Available from General Services Administration; [www.gsa.gov](http://www.gsa.gov).
    - c. Available from National Institute of Building Sciences/Whole Building Design Guide; [www.wbdg.org/cdb](http://www.wbdg.org/cdb).
  6. MILSPEC - Military Specification and Standards; (See DOD).
  7. USAB - United States Access Board; [www.access-board.gov](http://www.access-board.gov).
  8. USATBCB - U.S. Engineerural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; [www.bearhfti.ca.gov](http://www.bearhfti.ca.gov).
  2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; [www.calregs.com](http://www.calregs.com).
  3. CDHS; California Department of Health Services; (See CDPH).
  4. CDPH; California Department of Public Health; Indoor Air Quality Program; [www.cal-iaq.org](http://www.cal-iaq.org).
  5. CPUC; California Public Utilities Commission; [www.cpuc.ca.gov](http://www.cpuc.ca.gov).
  6. SCAQMD; South Coast Air Quality Management District; [www.aqmd.gov](http://www.aqmd.gov).
  7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; [www.txforestservation.tamu.edu](http://www.txforestservation.tamu.edu).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- D. Sewer, Water, and Electric Power Service: Use charges are specified in Section 011200 "Multiple Contract Summary."

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

- D. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
  - 1. Locations of dust-control partitions at each phase of work.
  - 2. HVAC system isolation schematic drawing.
  - 3. Location of proposed air-filtration system discharge.
  - 4. Waste-handling procedures.
  - 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails, with galvanized barbed-wire top strand.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete galvanized-steel bases for supporting posts.
- C. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.



SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
  1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
  1. Install electric power service underground unless otherwise indicated.
  2. Connect temporary service to Owner's existing power source, as directed by Owner.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

D. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

G. Temporary Elevator Use: Use of elevators is not permitted.

H. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

I. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with NYSDEC Standards requirements specified in Section 311000 "Site Clearing."
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to NYSDEC Standards.
  1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
  2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- F. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- H. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- I. Site Enclosure Fence: Prior to commencing earthwork, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
  1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

- J. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- L. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- M. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- N. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
  - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
  - 2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
    - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
  - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
  - 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
  - 1. Protect porous materials from water damage.
  - 2. Protect stored and installed material from flowing or standing water.
  - 3. Keep porous and organic materials from coming into prolonged contact with concrete.

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TEMPORARY FACILITIES AND CONTROLS

4. Remove standing water from decks.
  5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
  2. Keep interior spaces reasonably clean and protected from water damage.
  3. Periodically collect and remove waste containing cellulose or other organic matter.
  4. Discard or replace water-damaged material.
  5. Do not install material that is wet.
  6. Discard and replace stored or installed material that begins to grow mold.
  7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
  3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
    - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Engineer.
    - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

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TEMPORARY FACILITIES AND CONTROLS

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

END OF SECTION 015000

SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS

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SECTION 016500  
STARTING OF SYSTEMS

PART 1                      GENERAL

1.1      SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

1.2      RELATED TOPICS

- A. Quality Control: Manufacturers field reports.
- B. Contract Closeout: System operation and maintenance data and extra materials.

1.3      STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer seven (7) days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative and/or Contractors' personnel (as specified in individual Sections) in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report indicating that equipment or system has been properly installed and is functioning correctly.

1.4      DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two (2) weeks prior to date of Substantial Completion.
- B. Demonstrate project equipment and instruct in a classroom environment located at the site and instructed by a qualified manufacturers' representative who is knowledgeable about the project.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.
- G. The Owner reserves the right to videotape any of the demonstrations or instructions provided under this section.



SECTION 016500  
STARTING OF SYSTEMS

1.5 TESTING, ADJUSTING, AND BALANCING

- A. Appoint, employ, and pay for services of an independent firm to perform testing, adjusting, and balancing.
- B. Reports will be submitted by the independent firm to the Engineer indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

PART 2                      PRODUCTS  
Not Used

PART 3                      EXECUTION  
Not Used

END OF SECTION

SECTION 017300  
EXECUTION

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  - 1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
  - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

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- a. Primary operational systems and equipment.
  - b. Fire separation assemblies.
  - c. Air or smoke barriers.
  - d. Fire-suppression systems.
  - e. Plumbing piping systems.
  - f. Mechanical systems piping and ducts.
  - g. Control systems.
  - h. Communication systems.
  - i. Fire-detection and -alarm systems.
  - j. Conveying systems.
  - k. Electrical wiring systems.
  - l. Operating systems of special construction.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work. General Contractor shall engage a utility location service to locate all such utilities by non-destructive means prior to starting any demolition.
- 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

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- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

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- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish limits on use of Project site.
  - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 4. Inform installers of lines and levels to which they must comply.
  - 5. Check the location, level and plumb, of every major element as the Work progresses.
  - 6. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.
  - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.
  - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- D. Final Property Survey: Engage a professional engineering to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification,

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signed by professional engineering, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 78 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
  2. Allow for building movement, including thermal expansion and contraction.
  3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

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- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Repair or remove and replace damaged, defective, or nonconforming Work.
  - 1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

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5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
  1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.



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2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

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- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

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EXECUTION

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SECTION 017700  
CLOSEOUT PROCEDURES

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

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CLOSEOUT PROCEDURES

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number.
  - 5. Submit testing, adjusting, and balancing records.
  - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  - 6. Advise Owner of changeover in utility services.
  - 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 8. Complete final cleaning requirements.
  - 9. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

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CLOSEOUT PROCEDURES

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
  1. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Organize list of spaces in sequential order,
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Engineer.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. MS Excel electronic file. Engineer will return annotated file.

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CLOSEOUT PROCEDURES

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- C. Warranties in Paper Form:
  - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

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CLOSEOUT PROCEDURES

- b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- q. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.



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CLOSEOUT PROCEDURES

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017839  
PROJECT RECORD DOCUMENTS

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set(s) of marked-up record prints.
  - 2. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit record PDF files.
      - 3) Plot each drawing file, whether or not changes and additional information were recorded.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

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PROJECT RECORD DOCUMENTS

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
  - b. Accurately record information in an acceptable drawing technique.
  - c. Record data as soon as possible after obtaining it.
  - d. Record and check the markup before enclosing concealed installations.
  - e. Cross-reference record prints to corresponding photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
- a. Dimensional changes to Drawings.
  - b. Revisions to details shown on Drawings.
  - c. Depths of foundations.
  - d. Locations and depths of underground utilities.
  - e. Revisions to routing of piping and conduits.
  - f. Revisions to electrical circuitry.
  - g. Actual equipment locations.
  - h. Duct size and routing.
  - i. Locations of concealed internal utilities.
  - j. Changes made by Change Order or Work Change Directive.
  - k. Changes made following Engineer's written orders.
  - l. Details not on the original Contract Drawings.
  - m. Field records for variable and concealed conditions.
  - n. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file.
  2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Engineer for resolution.
  4. Engineer will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

SECTION 017839  
PROJECT RECORD DOCUMENTS

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

SECTION 017839  
PROJECT RECORD DOCUMENTS

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## **Division 02**



SECTION 021105  
CARE AND PROTECTION OF PROPERTY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Protection of Property
- B. Work within Highway Right-of-Way
- C. Notice to Property Owner

1.02 PROTECTION OF PROPERTY

- A. Do not enter or occupy with workers, tools, materials or equipment any land other than the right-of-way and easements without the written consent from the property owner.
  - 1. File a copy of the written consent with the ENGINEER.
  - 2. Assume full responsibility for the use of said private properties and defend the OWNER against all claims for damages from use of same.
- B. Provide and maintain all necessary watchman, barricades, lights and warning signs and take all necessary precautions for the protection and safety of the public, the OWNER, the ENGINEER and property.
- C. Continuously maintain adequate protection to all Work from damage, and take all reasonable precautions to protect the Public's and the OWNER's property from injury or loss arising in connection with this Contract.
- D. Make good any damage, injury or loss to the work and to the property of the OWNER and the Public resulting from lack of reasonable protective precautions, except as may be due to errors in the Contract Documents, or caused by the agents or employees of the OWNER.
- E. In an emergency affecting the safety of life, the work, or adjoining property, the CONTRACTOR is, without special instructions or authorization from the ENGINEER, hereby permitted to act at his sole discretion to prevent such threatened loss or injury. He shall also act, without appeal, if so authorized or instructed by the ENGINEER.
- F. Any compensation claimed on account of emergency work, to protect the public, the work, or adjoining property, will be determined by agreement or by arbitration.
- G. Exercise extreme care to prevent damage to trees, flowers, shrubs, etc. Bear all costs of replacing or repairing trees, shrubs, flowers, etc.
- H. Replace or re-erect all fences and guard rails taken down or disturbed to the satisfaction of the ENGINEER, at no additional cost to OWNER.
- I. Conduct work in a manner to properly protect all other utility facilities, such as gas mains, telephone and power conduits and poles, sewers, drainage, cable, fiber optics and other similar facilities. Work near these facilities in accordance with the utility's requirements, rules and regulations. If any utility is damaged, immediately notify the utility involved so that proper inspection and repair can be made.
- J. The OWNER or ENGINEER will attempt to notify the CONTRACTOR of any hazardous condition during non-working hours by telephone. If the OWNER or ENGINEER is unable to reach the CONTRACTOR or the CONTRACTOR fails to correct the hazardous condition utilizing all necessary safety devices within one (1) hour after notification, the OWNER will make all necessary repairs at the expense of the CONTRACTOR. If the hazardous condition is of such a nature, in the opinion of



SECTION 021105  
CARE AND PROTECTION OF PROPERTY

the ENGINEER, that it should be remedied immediately and the CONTRACTOR is unable or refuses to do so, the OWNER will make all necessary repairs at the expense of the CONTRACTOR.

1.03 NOTICE TO PROPERTY OWNERS

- A. Notify property owners at least one (1) week advance of pending construction. Keep driveways open and in good conditions at all times.

1.04 WORK WITHIN HIGHWAY RIGHTS-OF-WAY

- A. Perform and complete all work in State, County and Town rights-of-ways to the full satisfaction of the various Departments of Public Works concerned. Obtain all permits required.
- B. Conduct operations associated with the Work so as not to interfere with the movement of traffic on highways and with the operations of the particular Department of Public Works.
- C. If at any time during the work, traffic or facilities of the State of New York, County, Village or Town are endangered, immediately do such work as the representative of the particular Department of Public Works concerned may direct to restore safety. Bear all expenses of restoring safety based on the directions of the particular Department of Public Works representative, at no additional cost to the OWNER.
- D. Permit inspection by the State of New York, County, Village or Town at all times as the work progresses.
- E. Give written notice to the State of New York, County, Village or the Town five (5) days before work begins within their right-of-way.

1.05 WORK WITHIN WETLANDS AND WETLAND BUFFER ZONES

- A. The OWNER will obtain all necessary permits for working within wetlands and wetland buffer zones.
- B. The CONTRACTOR shall adhere to all of the requirements of the permits.
- C. No refueling, oiling, or greasing of construction equipment is allowed in the Wetland or New York State Wetland Buffer Zone.
- E. In the event of spillage of petroleum products within the Wetlands or Wetlands Buffer Zone, take prompt remedial action to stop, contain and remove any spilled materials.
- F. Remove excess spoils, in their entirety, off-site in an amount proportionate to the volume of the pipe and any bedding material installed. Maintain the original bottom contour surface elevations.

END OF SECTION

SECTION 021560  
PROTECTION OF THE ENVIRONMENT

PART 1 GENERAL

1.01 SUMMARY

- A. CONTRACTOR, in executing Work, shall maintain Work areas on- and off-site free from environmental pollution that would be in violation of federal, state or local regulations.
- B. CONTRACTOR is required to sign and submit ENGINEER's SWPPP to the OWNER and ENGINEER to file, when applicable.

1.02 PROTECTION OF STORM SEWERS

- A. Prevent construction material, pavement, concrete, earth or other debris from entering existing storm sewer or sewer structure.

1.03 PROTECTION OF WATERWAYS

- A. Observe rules and regulations of the State of New York and agencies of U.S. government prohibiting pollution of lakes, streams, rivers or wetlands by dumping of refuse, rubbish, dredge material or debris.
- B. Disposal of materials into waters of state must conform to requirements of the State of New York and the U.S. Army Corps of Engineers. All permits will be obtained by CONTRACTOR, copies provided to the ENGINEER, and posted on the job site.
- C. Apply appropriate soil conservation measures to protect project area and adjacent lands. These measures may include, but not be limited to, mulching, rapid growth vegetation, fabric mat, filter barriers, sediment traps, and basins.
- D. All work for this section shall be performed in strict accordance with "New York State Standards and Specifications for Erosion and Sediment Control", NYSDEC, latest edition, (i.e., Standards). The Standards are incorporated herein by reference.
- E. Prepare and submit the following to ENGINEER:
  - 1. Limits of disturbance.
  - 2. Sequence of construction as it relates to installation, phasing, and removal of sediment control measures.
- F. Provide erosion control measures, in place, before commencing work on project site.
  - 1. Maintain erosion control measure during course of construction.
  - 2. Remove erosion control measures upon establishment of permanent, surface stabilization.
- G. Complete temporary or permanent stabilization of surface of perimeter controls, dikes, swales, ditches, perimeter slopes, and slopes greater than 3:1 within 7 calendar days following initial soil disturbance. Stabilize other disturbed or graded areas within 14 calendar days.

SECTION 021560  
PROTECTION OF THE ENVIRONMENT

1.04 DISPOSAL OF EXCESS EXCAVATED AND OTHER WASTE MATERIALS

- A. Excess excavated material not required or suitable not for backfill and other waste material shall be disposed of in accordance with State and local regulatory requirements.
- B. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

1.05 PROTECTION OF AIR QUALITY

- A. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use.
- B. Do not burn trash on construction site.
- C. If temporary heating devices are necessary for protection of Work, they shall not cause air pollution.

1.06 THAWING OF FROZEN GROUND

- A. Obtain permit from appropriate local authority before building fire to thaw frozen ground, and comply with conditions of permit.
- B. Use fuel which does not create air pollution or inconvenience public.
- C. ENGINEER reserves right to prohibit fires for thawing whenever deemed undesirable.

1.07 USE OF CHEMICALS

- A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall be approved by U.S. EPA or U.S. Department of Agriculture or any other applicable regulatory agency.
- B. Use and disposal of chemicals and residues shall comply manufacturer's instructions.

1.08 NOISE CONTROL

- A. Conduct operations to cause least annoyance to residents in vicinity of Work, and comply with applicable local ordinances.
- B. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.
- C. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
- D. Line storage bins and hoppers with material that will deaden sounds.

SECTION 021560  
PROTECTION OF THE ENVIRONMENT

- E. Conduct operation of dumping rock and of carrying rock away in trucks so as to cause minimum of noise and dust.
- F. Route vehicles carrying rock, concrete or other material over such streets as will cause least annoyance to public and do not operate on public streets between hours of 6:00 p.m. and 7:00 a.m., or on Saturdays, Sundays or legal holidays unless approved by ENGINEER.

1.09 DUST CONTROL

- A. Due to close geographic location of Project to other off-site facilities and residential homes, take special care in providing and maintaining temporary site roadways, OWNER'S existing roads, and public roads used during construction operations in clean, dust free condition.
- B. Comply with state and local environmental regulations for dust control. If CONTRACTOR'S dust control measures are considered inadequate by ENGINEER, ENGINEER may require CONTRACTOR to take additional dust control measures.
- C. The use of calcium chloride is prohibited.

1.10 FUELS AND LUBRICANTS

- A. Comply with local, state and federal regulations concerning transportation and storage of fuels and lubricants.
- B. Fuel storage area and fuel equipment shall be approved by OWNER prior to installation. Submit containment provisions to OWNER for approval.
- C. Keep motorized equipment in good working order with no fuel or lubricant leakage. In the event of a leak, protect ground surface from leakage using tarps or other methods, and immediately remove leaking equipment or make repairs. Report spills or leaks from fueling equipment or construction equipment to OWNER and cleanup as required.
- D. OWNER may require CONTRACTOR to remove damaged or leaking equipment from Project site.
- E. Refueling, lubrication, and any other maintenance of equipment shall not be performed in or near any streams or wetland areas. Maintenance tasks shall be conducted at an upland staging area at least 100 feet away from any waters or wetlands. The CONTRACTOR shall have spill-kits on site at all times.

PART 2 PRODUCTS

2.01 (Not Used)

PART 3 EXECUTION

3.01 (Not Used)

END OF SECTION

SECTION 021560  
PROTECTION OF THE ENVIRONMENT

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SECTION 024116  
DEMOLITION

SECTION 024116 - DEMOLITION

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. Demolition and removal of buildings and site improvements.
  - 2. Disconnecting, capping or sealing, and abandoning in-place/removing site utilities.
  - 3. Salvaging items for reuse by Owner.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREDEMOLITION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be demolished.
  - 2. Review structural load limitations of existing structures.
  - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review and finalize protection requirements.

SECTION 024116  
DEMOLITION

5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
  1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.
- B. Schedule of Building Demolition Activities: Indicate the following:
  1. Detailed sequence of demolition work, with starting and ending dates for each activity.
  2. Temporary interruption of utility services.
  3. Shutoff and capping or re-routing of utility services.
- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building/facility immediately adjacent to demolition area. Conduct demolition so Owner's operations will not be disrupted.
- B. Buildings, tanks, and systems to be demolished will be vacated and their use discontinued before start of the Work.
- C. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
- D. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
- E. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- F. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner.

SECTION 024116  
DEMOLITION

- G. On-site storage or sale of removed items or materials is not permitted.

1.9 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

- A. Salvaged Items: Comply with the following:
  - 1. Clean salvaged items of dirt and demolition debris.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.



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DEMOLITION

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
1. Owner will arrange to shut off utilities when requested by Contractor.
  2. Arrange to shut off utilities with utility companies.
  3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
  4. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
  5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of demolition.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
  2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
    - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
1. Protect adjacent buildings and facilities from damage due to demolition activities.
  2. Protect existing site improvements, appurtenances, and landscaping to remain.
  3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
  4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.

SECTION 024116  
DEMOLITION

6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
  7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

- A. General: Demolish indicated building elements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
  2. Maintain fire watch during and for at least 30 minutes after flame-cutting operations.
  3. Maintain adequate ventilation when using cutting torches.
  4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
  2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Salvage: Items to be removed and salvaged are indicated below:

SECTION 024116  
DEMOLITION

1. None.
- D. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
- E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.7 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them at a licensed landfill.
  1. Do not allow demolished materials to accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
  1. Clean roadways of debris caused by debris transport.

END OF SECTION 024116

SECTION 029550  
TEMPORARY BYPASS PUMPING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

- A. The Contractor is required to furnish all material, labor, equipment, power, fuel, maintenance, etc. to implement any temporary pumping systems required for the purpose of diverting existing flows around various work areas during the project.
- B. The design, installation and operation of the temporary pumping systems shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Engineer that he specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least three (3) references of projects of a similar size and complexity as this project performed by his firm within the past three years. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
  - a. The maximum monthly daily flow to be handled is <2.0 MGD.
  - b. The average flow to be handled is 1.5 MGD.
  - c. The peak flow is 3,500 gpm.

1.2 SUBMITTALS

- A. The Contractor shall prepare with the vendor a specific, detailed description of the proposed pumping system and submit it and the vendor's references. Submittals without an acceptable detailed plan for the temporary bypass pumping system shall be rejected.
- B. The Contractor shall submit to the engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the contractor regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these contract documents. No construction shall begin until all provisions and requirements have been reviewed by the engineer.

The plan shall include but not limited to details of the following:

- B.1. Staging areas for pumps
- B.2. Number, size, material, location and method of Installation of suction piping
- B.3. Number, size, material, method of Installation and Location of installation of discharge piping
- B.4. Bypass pump sizes, capacity, number of each size to be on site and power requirements
- B.5. Calculations of static lift, friction losses, and flow Velocity (pump curves showing pump operating range shall be submitted)
- B.6. Downstream discharge plan
- B.7. Method of protecting discharge manholes or structures from erosion and damage

SECTION 029550  
TEMPORARY BYPASS PUMPING SYSTEMS

- B.8. Thrust and restraint block sizes and vent locations
- B.9. Any temporary pipe supports and anchoring required
- B.10. Design plans and computation for access to bypass pumping locations indicated on the drawings
- B.11. Calculations for selection of bypass pumping pipe size
- B.12. Schedule for installation of and maintenance of bypass pumping lines
- B.13. Plan indicating selection location of bypass pumping line locations

1.3 EQUIPMENT

- A. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.
- B. The Contractor shall provide check valves to isolate each pump separately when using a common manifold.
- C. The Contractor shall include one back-up pump of each size to be maintained on site.
- D. Back-up pumps shall be on-line, isolated from the primary system by a valve, and be set up with auto start control to bring pumps on line automatically.
- E. Discharge Piping – in order to prevent the accidental spillage of flows all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum “Irrigation” type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the engineer. Maximum velocities shall not exceed 10 ft/sec.
- F. Allowable piping materials will be quick disconnect galvanized steel pipe or fused, high-density polyethylene pipe as manufactured by Phillips Driscopipe, Inc. or equal.

1.4 SYSTEM DESCRIPTION – DESIGN REQUIREMENTS

- B. The Contractor is responsible for ensuring that the bypass pumping system is capable of meeting all flow requirements during the time at which the work is completed and of handling any additional flows resulting from inclement weather. The Contractor shall provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be replaced. Bypass pumping system will be required to be operated 24 hours per day as needed.
- B. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure. The Contractor shall provide a 24 hour, 7 day per week contact name and phone number for emergencies.
- C. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performances of work.

SECTION 029550  
TEMPORARY BYPASS PUMPING SYSTEMS

1.5 PERFORMANCE REQUIREMENTS

- A. It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, The Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and discharge it to a location that will allow for proper treatment and plant operational control.
- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- C. The Contractor shall provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstances.
- D. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.
- E. The Contractor shall protect water resources, wetlands and other natural resources. No discharge of wastewater is allowed to the on-site storm drainage system.

1.6 FIELD QUALITY CONTROL AND MAINTENANCE

- A. Inspection – Contractor shall inspect bypass pumping system every two hours to ensure that the system is working correctly.
- B. Maintenance Service – The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.
- C. Extra Materials – Spare parts for pumps and piping shall be kept on site as required. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

1.7 PREPARATION

- A. Precautions – Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
- B. During all bypass pumping operations, the Contractor shall protect the pumping station and main and all local sewer lines from damage inflicted by any equipment. The Contractor shall

SECTION 029550  
TEMPORARY BYPASS PUMPING SYSTEMS

be responsible for all physical damage to the pumping station and main and all local sewer lines caused by human or mechanical failure.

1.8      INSTALLATION AND REMOVAL

- A.      The Contractor shall make connections to the existing sewer and construct temporary bypass pumping structures only at access locations approved by the Engineer and Owner.
- B.      Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C.      When working inside manholes, treatment structures or piping systems, the Contractor shall exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces.
- D.      The Contractor must protect the bypass pipelines from traffic damage. Upon completion of the bypass pumping operations, and after the receipt of written permission from the engineer, the Contractor shall remove all piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining Owner's approval for placement of the temporary pipeline, prior to installation.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION ( Not used)

END OF SECTION

## **Division 03**





SECTION 031000  
CONCRETE FORMWORK

PART 1. GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment and incidentals required to design, install and remove formwork for cast-in-place concrete as shown on the drawings and as specified herein.
- B. Secure to forms or set for embedment all miscellaneous metal items, sleeves, reglets, anchor bolts, inserts, waterstops, fiberglass reinforced plastic components and other items furnished under other Sections and required to be cast into concrete.
- C. The General Contractor shall coordinate with other contractors as to inserting sleeves that are necessary to complete construction. The General Contractor shall be responsible for placement of such items for the other contractors.

1.02 SUBMITTALS AND TESTING

- A. Submit in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
  - 1. Form release agent
  - 2. Form ties
  - 3. Form liners (if shown on drawings)

1.03 REFERENCE STANDARDS (Most Current Edition)

- A. American Concrete Institute (ACI)
  - 1. ACI 301 - Specifications for Structural Concrete for Buildings
  - 2. ACI 318 - Building Code Requirements for Reinforced Concrete
  - 3. ACI 347R - Guide to Formwork for Concrete
- B. American Plywood Association (APA)
  - 1. Material grades and designations as specified

1.04 DESIGN OF FORMS

- A. Structural design responsibility: Contractor shall provide all forms and shoring designed by a professional engineer registered in the State of New York. Design and erect formwork in accordance with the requirements of ACI 301 and ACI 318 and as recommended in ACI 347R. Comply with all applicable regulations and codes. Consider special requirements due to the use of plasticized and/or retarded set concrete.
- B. Review of the submitted materials will not relieve the Contractor of responsibility for the strength, safety, or correctness of methods used.
- C. Demonstrate to the Engineer on a designated area of the concrete substructure exterior surface that the form release agent will not impair the bond of paint, sealant, waterproofing, or other coatings and will not affect the forming materials.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Make forms for cast-in-place concrete of wood or steel, except as specified in Paragraphs 2.1B. Construct wood forms of sound lumber or plywood free from knotholes and loose knots.

SECTION 031000  
CONCRETE FORMWORK

Construct steel forms to produce surfaces equivalent in smoothness and appearance to those produced by new plywood panels. Design and construct all forms to provide a flat, uniform concrete surface requiring no grinding, repairs, or finishing except as specified in Section 03345.

- B. Make forms for exposed (non-submerged) exterior and interior concrete of new and unused Plyform exterior grade plywood panels manufactured in compliance with the APA and bearing the APA trademark. Provide B grade or better veneer on all faces to be in contact with concrete.
- C. Provide rigid forms that will not deflect, move, or leak. Design forms to withstand the high hydraulic pressures resulting from rapid filling of the forms and heavy high frequency vibrations of the concrete. Limit deflection to 1/400 of each component span.
- D. Column forms shall have a 3/4" chamfer on all corners unless otherwise indicated.
- E. Form release agent shall be applied to all form surfaces that come in contact with concrete. The form agent shall be non-staining, non-residual, water based, and bond breaking. The form release agent shall not impair the bond of paint, sealant, waterproofing or other coatings.
- F. Form ties shall be as follows:
  - 1. Flat bar ties for panel forms shall have plastic or rubber inserts with a minimum depth of 1.5" and manufactured to permit patching of the tie hole.
  - 2. Wire ties shall be manufactured so that after removal of the projecting part, no metal remains within 1.5" of the face of the concrete. The part of the tie to be removed shall be provided with a plastic or wooden cone at least 1/2" diameter and 1.5" long. Provide cone washer type ties in concrete exposed to view or sewage.
  - 3. Provide ties for liquid containment structures and exterior below grade basement walls that have a neoprene rubber washer waterstop.

PART 3. EXECUTION

3.01 GENERAL

- A. Clean, fill and seal form tie holes with non-shrink cement grout.
- B. Provide forms for all cast-in-place concrete including the sides of footings. Construct and place forms to provide concrete of the shape, lines, dimensions and appearances indicated.
- C. Provide removable panels at the bottom of the forms for walls and columns to allow cleaning, inspection, and joint surface preparation. Provide closable intermediate inspection ports in forms for walls. Provide tremies, flexible hose, and hoppers for placement of concrete to prevent drops of greater than 5'-0" and to prevent accumulation of hardened concrete on forms and reinforcing above the freshly placed concrete.
- D. Place molding, bevels or other types of chamfer strips securely in forms.
- E. Provide rigid forms to withstand construction loads and vibration and remain within tolerance of deflection limits.

3.02 FORM PREPARATION

- A. Clean, repair, remove projecting nails and fill holes, and smooth protrusions on all form surfaces to be in contact with concrete before reuse.
- B. Coat wood forms in contact with concrete using a form releasing agent prior to form installation.
- C. Clean steel forms by sandblasting or other means to remove mill scale and other ferrous deposits from the contact surface. Coat steel forms in contact with concrete form releasing agent prior to form installation.

3.03 FORM INSPECTION

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CONCRETE FORMWORK

- A. Notify Engineer when forms are complete and at least 2 working days before the placement of concrete.

3.04 REMOVAL OF FORMS

- A. The Contractor is responsible for all damage resulting from the removal of forms and shall repair at no cost to the Owner.

END OF SECTION

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CONCRETE FORMWORK

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SECTION 032000  
CONCRETE REINFORCEMENT

PART 1. GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment and incidentals required to design, install reinforcement for cast-in-place concrete as shown on the drawings and as specified herein.
- B. Dowels embedded into concrete and reinforcing of lintels for masonry units.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. All steel used on the project must meet the requirements of the American Iron and Steel Act. Submit certification with shop drawings.

1.03 SUBMITTALS AND TESTING

- A. Submit in accordance with Section 01300, shop drawings and product data showing materials of construction and details of installation for:
  - 1. Reinforcing steel in accordance with ACI 315
- B. Review of the submitted materials will not relieve the Contractor of responsibility for the strength, safety, or correctness of methods used.

1.04 REFERENCE STANDARDS (Most Current Edition)

- A. American Concrete Institute (ACI)
  - 1. ACI 301 - Specifications for Structural Concrete for Buildings
  - 2. ACI 318 - Building Code Requirements for Reinforced Concrete
  - 3. ACI 315 (SP-66) - Details and Detailing of Concrete Reinforcement
- B. American Society for Testing and Materials
  - 1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - 2. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
  - 3. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
  - 4. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
  - 5. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
  - 6. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
- C. American Welding Society (AWS)
  - 1. AWS D1.4 Structural Welding Code - Reinforcing Steel
- D. Concrete Reinforcing Steel Institute (CRSI)
  - 1. Manual of Standard Practice

1.05 DELIVERY, HANDLING AND STORAGE

- A. Reinforcing steel shall be free of mill scale, rust, dirt, grease and other foreign matter.

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CONCRETE REINFORCEMENT

- B. Ship and store reinforcing steel with bars of the same size / shape / grade and tag with a waterproof mark designation that is the same as those on the submitted shop drawings.
- C. Store reinforcing steel off of the ground and protect against dirt and moisture.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Deformed Concrete Reinforcing Bars are to be Grade 60, ASTM A615
- B. Deformed Concrete Reinforcing Bars required to be field bent or welded are ASTM A706
- C. Welded Steel Wire Fabric to be ASTM A185
- D. Welded Deformed Steel Wire Fabric to be ASTM A497
- E. Reinforcing Steel Accessories
  - 1. Plastic Protected Wire Bar Supports: CRSI Bar Supports, Class 1 - Maximum Protection.
  - 2. Stainless Steel Protected Wire Bar Supports: CRSI Bar Supports, Class 2 - Moderate Protection with legs made wholly from stainless steel wire
  - 3. Precast Concrete Bar supports: CRSI Bar Supports, Precast Concrete Bar Supports. Precast concrete blocks that have equal or greater strength than the surrounding concrete.
- F. Tie Wire for reinforcing shall be 16-gauge or heavier black annealed wire

2.02 FABRICATION

- A. Comply with the CRSI Manual of Standard Practices
- B. Bend bars cold. Do not straighten or re-bend or heat bars
- C. Bend bars around a revolving collar having a diameter not less than that recommended by The CRSI manual
- D. Saw cut bar ends that are to be butt spliced, placed through limited diameter holes in metal or threaded.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Comply with the CRSI Manual of Standard Practice for surface condition, bending, spacing, and tolerances of placement for reinforcement. Provide the amount of reinforcing indicated at the spacing and clearances shown on the drawings.
- B. Determine clear concrete cover based on exposure. Unless noted otherwise on the drawings, provide the following minimum concrete cover:
  - 1. Concrete cast against and permanently exposed to earth 3"
  - 2. Concrete exposed to soil, water, sewage, sludge and/or weather:
    - a. Slabs and walls (both faces) 3"
    - b. Beams and columns (ties, spirals, stirrups) 3"
  - 3. Concrete not exposed to soil, water, sewage, sludge and/or weather:
    - a. Slabs and walls (both faces) 1"
    - b. Beams and columns (ties, spirals, stirrups) 1.5"
- C. Coat placed reinforcement that will be exposed for 60 + days with a heavy coat of neat cement slurry.
- D. Do not weld reinforcing either during fabrication or erection unless indicated on the drawings or as specified herein or prior written approval by the engineer. Remove all bars that have been

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CONCRETE REINFORCEMENT

welded (including tack welds) without such approvals or directions. Comply with AWS D1.4 when authorized or instructed to weld reinforcement.

- E. Reinforcement bars interfering with the location of the other reinforcing steel, conduits or embedded items may be moved within the specific tolerances or one bar diameter, whichever is greater. Obtain engineers approval should a greater displacement be required to avoid the interference. Do not cut reinforcement to install inserts, conduits, sleeves, etc.
- F. Secure, support and tie reinforcing steel to prevent movement during concrete placement. Secure dowels in place before placing concrete.
- G. Closely inspect the reinforcing steel for breaks. Replace and repair by cutting out damaged bar(s) and splicing new bars.

3.02 REINFORCEMENT AROUND OPENINGS

- A. Provide additional reinforcing steel on each side of the opening equivalent to one half of the cross-sectional area of the reinforcing steel interrupted by the opening unless indicated otherwise. Extend each end of each bar beyond the edge of the opening or penetration by the tension development length for that bar size.

3.03 SPLICING OF REINFORCEMENT

- A. Compression splices - provide lap splice of 30 bar diameters, but not less than 12" unless indicated on the Drawings. Base the lap splice length for column vertical bars on the bar size in the column above.
- B. Tension lap splices shall be in accordance with ACI 318. Stagger splices in adjacent bars. Provide Class B tension lap splices at all locations unless otherwise indicated.
- C. Lap splices in welded wire fabric in accordance with the requirements of ACI 318 but not less than 12". Tie the spliced fabrics together with wire ties spaced not more than 24" on center and lace with wire of the same diameter as the welded wire fabric. Offset splices in adjacent widths to prevent continuous splices.

3.04 ACCESSORIES

- A. Provide and install accessories such as chairs, chair bars and the like to support the reinforcement at the spacings and clearances indicated on the Drawings. Secure accessories to prevent the displacement of such items during erection and concrete placement.
- B. Use precast concrete blocks where reinforcing is to be supported over soil.
- C. Provide #5 support bars (minimum). Do not reposition upper bars in a bar mat for use as support bars.

3.05 INSPECTION

- A. Notify engineer when the reinforcing is complete and ready for inspection at least two working days prior to placement of concrete. Do not cover the reinforcing steel with concrete until the engineer has inspected and approved the reinforcement for size, spacing, splice lengths and positions.
- B. Forms are to be kept open for the engineer to perform the inspection.

END OF SECTION



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CONCRETE REINFORCEMENT

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SECTION 033000  
CAST-IN-PLACE CONCRETE

PART 1. GENERAL

1.01 SUMMARY

This section describes materials and methods for cast-in-place concrete, including materials, reinforcement, formwork, and testing. These Specifications shall apply to all concrete installed by any Contractor on the project.

1.02 REFERENCES

The American Concrete Building Code Requirements for Reinforced Concrete ACI 318, ACI 350 and all standards cited in this code shall apply to all work. These include but are not limited to the following:

A. American Concrete Institute (ACI)

1. ACI 117-90 - Standard Specifications for Tolerances for Concrete Construction and Materials
2. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
3. ACI 212.3R-04 - Chemical Admixtures for Concrete
4. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete
5. ACI 305R - Hot Weather Concreting
6. ACI 306R - Cold Weather Concreting
7. ACI 318 - Building Code Requirements for Reinforced Concrete
8. ACI 350 - Environmental Engineering Concrete Structures

B. American Society for Testing and Materials

1. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 - Standard Specification for Concrete Aggregates
3. ASTM C39 - Standard Test Method for Compressive Strength of Cylinder Concrete Specimens
4. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94 - Standard Specification for Ready-Mixed Concrete
6. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete
7. ASTM C150 - Standard Specification for Portland Cement
8. ASTM C171 - Standard Specification for Sheet Materials for curing Concrete
9. ASTM C173 - Standard Test Method for Air content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 - Standard Test Method for Air content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete
12. ASTM C311 - Standard Test Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
13. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete
14. ASTM C618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete

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15. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for use in Construction and Criteria for Laboratory Evaluation
16. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates
17. ASTM E329 - Standard Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction

C. National Ready Mixed Concrete Association (NRMCA)

1. Quality Control Manual

D. Truck Mixer Manufacturers Bureau (TMMB)

1. TMMB 100 - Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards

1.03 SUBMITTALS AND TESTING

A. Concrete Mix Submittals

1. Submit concrete mix design for each formulation of concrete proposed for use. Include sources of cement, fly ash, aggregates, air-entraining admixture, water reducing admixture, water / cement ratio and concrete slump.
2. Include in the concrete mix submittal concrete test reports to substantiate concrete suppliers standard deviation and concrete mix design. The concrete supplier shall certify that all concrete mix designs meet all requirements of ASTM C33, including all provisions regarding alkali silica reaction (ASR).

B. Reinforcement Shop Drawings

1. The Contractor shall furnish shop drawings detailing all reinforcement indicated on the contract drawings. No reinforcement shall be fabricated prior to the approval of these drawings.
2. The Contractor shall submit mix designs for all types of concrete to be used in the work, and the name and location of concrete material suppliers.

C. Qualifications of the testing laboratory shall be submitted and contain the following:

1. Name and address
2. List of technical services to be provided
3. Name and qualifications of the employees taking the samples and performing the tests

D. Material certifications for the following shall be submitted, all material certifications shall be signed by the supplier.

1. Cementitious materials
2. Admixtures
3. Steel reinforcement and accessories
4. Aggregates
5. Curing compounds

E. Field Testing

1. The contractor shall provide field testing by an independent testing laboratory as follows:

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CAST-IN-PLACE CONCRETE

- a. A laboratory test consisting of six (6) concrete cylinders shall be made of the concrete used in each major pour. The concrete contractor shall perform one such test on each day that concrete is poured and for each 50 cubic yards, or fraction thereof, as a part of the Contract. A record shall be kept showing the time and location of the batch from which the test was made. Three (3) copies of the test reports shall be transmitted directly from the testing laboratory to the Engineer who, in turn, will transmit one to the Owner. Tests results submitted by the Contractor shall not be accepted. The cost of all concrete testing shall be borne by the Contractor.
  - b. Test specimens shall consist of 6" by 12" cylinders, prepared in accordance with the latest edition of the ASTM Standard Specifications entitled "Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field". All tests will be as follows:
    - 2 cyl - 7 days
    - 2 cyl - 14 days
    - 2 cyl - 28 days
  - c. All specimens shall be tested by a certified testing laboratory, approved by the Engineer, in accordance with the latest edition of the ASTM Standard Specifications entitled "Standard Method of Test for Compressive Strength of Molded Concrete Cylinders: Serial Designation: C39.
  - d. The testing laboratory shall conduct field tests for air entrainment and slump on all batches from which cylinders are collected in accordance with ASTM C172-0 Standard Practice for Sampling Freshly Mixed Concrete.
  - e. Any concrete that fails to meet the specified requirements shall be removed and replaced with approved materials at the Contractor's expense, when and as directed by the Engineer.
- F. All submittals shall include a certification of full compliance with ARRA Buy American requirements
- G. Other Items
- 1. The Contractor shall provide copies of all concrete batch plant truck slips at the time of delivery.

1.04 DELIVERING, HANDLING AND STORAGE

- A. Cement: Store in weather tight container to protect against contamination
- B. Aggregate: Do not use frozen or partially frozen aggregate
- C. Sand: Allow sand to drain to uniform moisture content before using. Do not use partially frozen sand.
- D. Admixtures: Store in weather tight container to protect against contamination, do not allow to freeze and allow provide agitating equipment for uniform dispersion in concrete mix.

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CAST-IN-PLACE CONCRETE

1.05 QUALITY ASSURANCE

- A. Comply with American Concrete Building Code Requirements for Reinforced Concrete ACI 318, 350R and all standards cited (most recent edition) in this code shall apply to all work.
- B. Independent testing laboratory shall meet the requirements of ASTM E329 and ASTM C1077 and be acceptable to the Engineer. There shall be no relationship / co-ownership between the Contractor or concrete manufacturer and the Testing Laboratory that would cause a conflict of interest.
- C. Any concrete that fails to meet the specified requirements shall be removed and replaced with approved materials at the Contractor's expense, when and as directed by the Engineer.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Delivery, Storage and Handling:
  - 1. All materials shall be so delivered, stored and handled as to prevent the inclusion of foreign materials and damage of material by water. All materials shall be of the respective type specified herein.
- B. Water
  - 1. Water shall be clean and free from deleterious materials.
- C. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type II, gray, with low alkali (less than 0.6% NaOH). Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class F with maximum carbon content of 3%.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- D. Aggregates

Aggregates shall conform to ASTM C-33. In addition, the amount of fine aggregate passing through a #200 sieve shall be less than 0.5%. Aggregates shall be tested and show no potential for alkali reactivity in accordance with ASTM C1260.
- E. Reinforcing Bars

All reinforcement, used in this work, shall be of clean, new stock free from defects and free from bends not required by the drawings. The reinforcement shall be delivered, at the site of the work, free of mill or rust scales. The reinforcement shall be sorted for mesh and size and/or for size and length, properly identified and stored in racks suitably protected from the weather.

Reinforcing Bars shall conform to specifications for Deformed Billet Steel Bars for Concrete Reinforcement (ASTM A615). The yield strength of all bars (fy) shall be 60,000 psi, unless noted otherwise on the contract plans.

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All reinforcement shall be tied in accordance with ACI recommendations for allowable movement during construction.

F. Mesh

Reinforcement shall be welded mesh fabric of the respective weights and sizes called for on the drawings, or as may be hereinafter specified. Wire mesh shall conform in all respects to the ASTM Standard Specifications for "Cold Drawn Steel Wire for Concrete Reinforcement" - Serial Designation A185-37.

G. Admixtures

All admixtures shall be subject to approval by the Engineer.

Air Entraining admixtures shall conform to the specifications of ASTM C260.

Water Reducing admixtures shall conform to ASTM C494, Type A or Type F.

Proportion and mix is accordance with manufacturer's recommendations.

H. Flexible PVC Waterstops:

CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes. Profile shall be ribbed without center bulb and dimensions shall be 6 inches by 3/8" thickness

I. Self-Expanding Waterstops:

Manufactured rectangular or trapezoidal strip, with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.

J. Injection Waterstops:

Flexible tubular strip reinforced with spiral wire and covered with woven membrane and injected with a polyurethane hydrophobic polymer grout.

K. Liquid Water-Repellant:

All exposed exterior concrete which does not contain the waterproofing admixture shall have a water repellant applied to 1' below scheduled finish grade and 1' below the normal water surface level. Additionally, all existing exterior concrete not scheduled to have other sealants applied shall be coated with liquid water repellant. The repellant shall be a non-toxic, breathable, clear water repellent intended for single-coat application that, after cure, leaves no visible surface residue, color or gloss. Silicone or acrylic based materials will not be accepted. Repellant shall be Hydrozo Clear 600 as manufactured by Hydrozo Coatings Co., Barrier B-28 percent as manufactured by Barrier Chemical Corp. or approved equal.

L. Waterproofing:

Xypex Concentrate Admix C-2000 / C-1000 concrete waterproofing or Penetron® Admix concrete waterproofing as manufactured by Penetron®. The admixture shall be used in all concrete tank walls and slabs that contain liquids.

M. Sealant:

All interior concrete slabs not receiving the water proof admixture shall be sealed with an aqueous, urethane fortified, thermoplastic resin. Sealant shall be Sikafloor® WB-20 Concrete Sealer as manufactured by the Sika Cooperation or approved equal.

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2.02 CONCRETE

All concreting, both labor and materials, shall conform to the following:

- A. Develop concrete mixes and their testing by an independent testing laboratory engaged by and at the expense of the Contractor
- B. The ingredients shall be proportioned to meet the design strength and materials limits specified in Table 1 and to produce workable, durable concrete conforming to these specifications
- C. Base concrete mixes on standard deviation data of prior mixes with essentially the same proportions of the same materials or develop concrete mixes by laboratory tests using the materials proposed for the work. For concrete mixes developed by laboratory testing, base cement content of the concrete on curves showing the relationship between water : cement ratio and 7 and 28-day compressive strengths of concrete made using the proposed materials. Determine curves by four or more points, each representing an average value of at least three test specimens and one water : cement ratio at each age. Provide curves with a range of values sufficient to yield the desired data, including the compressive strengths specified, without extrapolation. The cement content of the concrete mixes to be used, as determined from the curve, shall correspond to the required average compressive strength in Table 5.3.2.2 of ACI 318. The resulting mix shall not conflict with the limiting values for maximum water : cement ratio and net minimum cement content specified in Table A of this section.
- D. Test the fly ash and/or the fly ash and concrete mixture to provide test data confirming that the fly ash in combination with the cement to be used meets all strength requirements and is compatible with the other concrete additives.
- E. Test aggregates for potential alkali reactivity in accordance with ASTM C1260.
- F. Entrained Air shall be measured by ASTM C231 and be in accordance with Table A
- G. Slump shall be measured by ASTM C143 and be in accordance with Table A
- H. Proportion admixtures according to the manufacturer's recommendations. Two or more admixtures specified may be used in the same mix provided that the admixtures in combination retain full efficiency and have no deleterious effect on the concrete or on the properties of the other admixture(s). The aggregates shall be proportioned so as to produce a conglomerate aggregate of the minimum void content, plus the necessary excess of fines as may be required to give the desired workability. The mixed concrete shall contain a sufficient quantity of cement paste to slightly overfill the void.

All mixes should conform to the following Table A:

Mix A - For concrete fill applications

Mix B - For Non-liquid holding structures; walks, building foundations / slabs

Mix C - For Liquid containing structures with walls / slabs 16" thick or greater

Mix D - For Liquid containing structures with walls / slabs 16" thick or less

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TABLE A					
Mix	28-Day Design Strength (PSI)	Cement ASTM*	Fine Aggregate*	Coarse Aggregate*	Cement Content (Lbs/CY)
A	2500	C150 Type II	C33	C33	440
B	4000	C150 Type II	C33	C33	520
C	4500	C150 Type II	C33	C33	590
D	4500	C150 Type II	C33	C33	590
Mix	Water/Cement Ratio	Fly Ash**	Entrained Air (%)	Water Reducer	Slump Range
A	0.50	Yes	4.5 to 7.5	Yes	3.0" - 5.0"
B	0.44	Yes	4.5 to 7.5	Yes	3.0" - 5.0"
C	0.42	Yes	4.5 to 7.5	Yes	3.0" - 5.0"
D	0.42	Yes	4.5 to 7.5	Yes	3.0" - 5.0"

All sidewalks shall include 1.5 lb. fiberglass fibers per cubic yard, Fibermesh, Grace or equal.

Flyash content shall be between 15% and 25% if the total cementitious material used in the batch.

All interior floor slabs shall contain as close to 0% entrained air as possible. Do not allow air content to rise above 3%. Any concrete intended for interior floor slabs with an air content greater than 3% will be rejected.

The Engineer must approve all mixes to be used prior to construction. No mix or concrete may be used without approval by the Engineer.

The batch plant and the Contractor shall conform to all batch times and time limits specified by NYSDOT. Loads exceeding those times will be rejected.

### PART 3. EXECUTION

#### 3.01 WORKMANSHIP

Workmanship shall be of the highest quality and only competent and experienced workmen, skilled in their trade, shall be employed on this work.

#### 3.02 MEASURING MATERIALS

- A. Provide concrete composed of Portland cement, fly ash, fine aggregate, coarse aggregate, water and admixtures as specified and produced by a plant complying with ACI 318 and ASTM C94. Batch all constituents, including admixtures, at the plant.
- B. Measure materials for batching concrete by weighing in conformity with and within the tolerances stated in ASTM C94. Scales must be certified by Sealer of Weights and Measures within one year of use. Weigh cement and fly ash in individual weigh batches that are separate and distinct from those used for other materials.



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- C. Measure the amount of free water in fine aggregates within 0.3% with a moisture meter. Adjust for moisture content of fine aggregates. Record the number of gallons of water as-batched on printed batch tickets.

3.03 MIXING AND TRANSPORTING

- A. Comply with ACI 304R, ACI 318 and ASTM C94 for all central plant and transport methods.
- B. Provide ready-mixed concrete produced by equipment complying with ACI 318 and ASTM C94 and produced by a plant certified by the NRMCA. All truck mixers shall carry a rating plate conforming to TMMB 100. Clean each mix truck drum and reverse drum rotation before truck proceeds under the batching plant. Each transit-mix truck must have a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.
- C. The entire contents of the drum shall be discharged before recharging. The mixer shall be cleaned whenever mixing is suspended and at frequent intervals when in use.
- D. The volume of the mixed material per batch shall not exceed the manufacturer's rated capacity of the mixer.
- E. No concrete shall be placed in the work after its initial set has occurred and re-tempered concrete shall not be used under any conditions.
- F. Contractor is to provide equipment of size and type to provide continuous flow of concrete at the delivery end.
- G. Weigh-tickets shall be prepared and delivered, in duplicate, with each truck showing the actual batch size; quantity delivered; the actual weights of cement, fine and coarse aggregate, fly ash and water; moisture content of fine and coarse aggregate at time of batching; type, brand and quantity of each admixture; time of loading at the ready-mix plant; the time and quantity of any additional water. A blank shall also be provided on the weigh-ticket for the time of arrival at the site; this space is to be filled in and initialed by the Contractor's superintendent or foreman. A copy of the weigh-ticket shall be delivered to the Engineer for each batch of concrete delivered to the site.
- H. The Engineer or representative, shall have access to the batch plant, from which the ready-mixed concrete is supplied, for the purpose of inspecting materials used in the mix and for checking and reporting the time of departure of each truck from the mixing plant to the job site.
- I. The mix truck, used in transporting the concrete shall have its drum rotating from the time it is charged until it is discharged.
- J. Temperature and Mixing Time Control
  - 1. In cold weather, if water or aggregate has been heated, combine water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the mixture temperature is greater than 90° F.

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2. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below 90° F.
3. Maximum time interval from the addition of mixing water and/or cement to the batch and the final placement in the forms shall not exceed:

Temperature of Air or Concrete	Maximum Time
80° F to 90° F.	45 minutes
70° F to 79° F	60 minutes
40° F to 69° F	90 minutes

3.04 PLACING

- A. Before placing concrete, the forms shall be thoroughly cleaned of all chips, shavings and other debris. Provisions shall be made for transporting the concrete rapidly from the place of mixing to the work with as little jostling as possible so that the tendency of the water to rise to the top may be reduced to a minimum.
- B. The concrete shall be placed before it has had time to attain the initial set and under no conditions shall it be re-tempered and used. Any concrete which may have become compacted shall be satisfactorily re-mixed just before placed in the forms.
- C. Concrete shall not be deposited in freestanding water, loose dirt, rubbish or other foreign matter, nor shall water be permitted to rise on or flow over freshly placed concrete until the concrete has set for at least twenty four (24) hours.
- D. Concrete shall be deposited as near its final position as is possible to prevent segregation. thoroughly worked around reinforcement, imbedded accessories and into the corners of the forms.
- E. Concreting shall proceed at such a rate that the previously placed concrete is integrated with fresh plastic cement. Concrete shall at all times be plastic and flow readily into the space between the bars.
- F. Slabs: Place each batch into the edge of the previously placed concrete to avoid stone pockets, segregation and cold joints.
- G. In placing concrete, care shall be taken to avoid disturbing the steel reinforcing extending into the concrete that has partially set.
- H. All concrete shall be adequately protected from mechanical injury or by actions of the elements until such time as the concrete is thoroughly set.
- I. Place concrete in forms using tremie tubes taking care to prevent segregation. Keep end of tremie tubes in contact with the concrete already in place. Do not drop concrete freely more than 4 feet. Place concrete for walls in 12" to 24" lifts keeping the walls surface horizontal.

3.05 COMPACTING

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- A. Consolidate concrete by vibration and puddling, spading, rodding or forking so that concrete is completely worked around reinforcement, embedded items, openings and into corners. Continuously perform puddling, spading, rodding and forking along with vibration of the placement of concrete to eliminate air or stone pockets.
- B. Compact all concrete with mechanical vibrators. Keep standby vibrators on site during placing of concrete
- C. Use vibrators having a minimum frequency of 7000 revolutions per minute. Insert vibrators and withdraw at points from 18" to 30" apart. Vibrate sufficiently at each insertion to consolidate concrete, generally 5 to 15 seconds. Do not over vibrate so as to segregate.
- D. All laborers are to be trained in the correct use of mechanical vibrators in concrete consolidation.

3.06 CURING

- A. As soon as the exposed horizontal concrete surfaces have been finished and are sufficiently hardened (not easily scratched), they shall be cured to retain moisture and maintain a temperature of at least 50° F for a minimum of 7 days after placement. Curing shall be done by one of the two methods outlined below:
  - 1. Water Curing (Liquid Containing Structures, structural slabs, slabs receiving grout):  
All exposed concrete surfaces shall be kept constantly moist by continuously sprinkling with clean water that is within 20° F of the concrete temperature or by covering with burlap which shall be continuously kept moist. Water curing will not be allowed during freezing weather.
  - 2. Sheet Material Curing (slabs not requiring water curing as listed above):  
All finished exposed concrete surfaces cured through the use of sheet material shall conforming to the ASTM C171. The sheet material shall be lapped 6 inches along all edges and remain covering the concrete for at least seven (7) days. All joints shall be taped and any tears resulting from subsequent operations on the slab within the seven days shall be taped or the sheet replaced.

3.07 TEMPERATURE OF CONCRETE

- A. Concrete, when deposited, shall have a temperature ranging between a minimum of fifty (50) degrees F. and a maximum of ninety (90) degrees F.
- B. No concrete shall be deposited during freezing temperatures without explicit permission of the Engineer.
- C. Cold Weather shall be defined as a 3-successive days having an average outdoor temperature of 40° F or lower.
  - 1. Concrete placement, curing, protection, delivery, and batch formula (admixtures, heating) shall comply with ACI 306R
  - 2. Contractor shall provide a cold weather concreting plan outlining methods and procedures for batch formula changes, transportation, placement, protection, curing, concrete temperature monitoring, standby equipment, etc.

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3. The minimum temperature of concrete immediately after placement and during the protection period shall be:  
    < 12" thick section = 55° F                      (Max Temp. 75° F)  
    12" to 36" = 50° F                                (Max Temp. 70° F)
  4. Protect concrete during cold weather by providing continuous warm, moist curing for a total of 350 degree-days of curing. Degree-days are defined as the daily average temperature of the air at the concrete surface over a 24-hour period. Temperature is to be taken in the shade.
  5. Protect the concrete surface from direct exposure to temperatures 40° F and below.
- D. Hot Weather concreting is defined in ACI 305R as a rate of evaporation exceeding 0.2 pounds per square foot per hour as a result of high temperatures, low humidity and wind velocity. The Contractor shall request the Engineer to make a determination of Hot Weather protection measures in accordance with ACI 305R should the climate dictate.
1. Temperature of the concrete being placed shall not exceed 90° F.
  2. Contractor shall provide a hot weather concreting plan outlining methods and procedures for batch formula changes, transportation, placement, protection, curing, concrete temperature monitoring, standby equipment, etc.

3.08 FIELD TESTS

- A. Slump Tests shall be made by the Testing Lab personnel immediately prior to placing the concrete. Such tests shall be made in accordance with ASTM C143. If the slump is greater than the specified range, the concrete will be rejected.
- B. Air Content: Test for air content shall be made by the Testing Lab personnel on a fresh concrete sample. Such tests shall be made in accordance with ASTM C231 or ASTM C173 if the volumetric method is used due to high absorption aggregates.
- C. Water Content: Test for water content shall be made by the Engineer or Testing Lab personnel on a fresh concrete sample. Such tests shall be made in accordance with AASHTO T318.

3.09 DEFECTIVE WORK

- A. All concrete work, not formed as shown on the drawings, out of alignment or level, or showing a defective surface, shall be removed and completely replaced in a manner meeting with the Engineer's approval. Slight imperfections, which may be patched without impairing the strength or appearance of the structure, may be patched, providing the Engineer's permission is obtained prior to the patching.
- B. Permission to patch work shall not be considered as a waiver of the Owner's right to require complete removal of such defective work if the patching done fails to satisfactorily restore the quality and appearance of the work. In short, all defective concrete work shall be made good by patching or replacement, regardless of any previous permission that the Contractor may have received regarding procedure or methods of concrete operations.
- C. Defective areas, which are to be replaced when so directed by the Engineer, shall be chipped away to a depth not less than two (2) inches clear inside of the reinforcement and the edges of the cut shall be perpendicular to the finished surface. The surfaces of the cut and a space

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at least six (6) inches wide, entirely surrounding the cut, shall be wetted thoroughly to prevent absorption of water from the patching mortar. The patch shall be made of the same materials and of the same proportions as were used for the original concrete except that the coarse aggregate shall be omitted and fine aggregate substituted therefore. In order for the patch to match the surrounding concrete, it may be necessary to substitute white cement for a part of the gray cement. The amount of water used in mixing shall be as little as is consistent with the requirements of handling and placing. The mortar shall be thoroughly compacted into place and shall be finished slightly higher than the surrounding surface. It shall then be left undisturbed from two (2) to three (3) hours to permit the initial shrinkage before being finished. The patch shall be finished to match the adjoining surface and shall be protected and cured as provided herein before.

3.10 POINTING AND PATCHING

- A. Immediately after the removal of forms, the concrete surfaces shall be inspected for defective areas and the Contractor shall immediately replace and/or patch all imperfections in accordance with these specifications. No pointing or patching shall be done prior to the inspection of such imperfections by the Engineer and then shall be done only after his approval has been given.
- B. All grout shall be composed of one (1) part Portland Cement and two (2) parts sand.

3.11 CLEANUP

- A. Any and all work, of this and/or other trades, soiled or damaged in the execution of the work covered by this section of the specifications, shall be thoroughly cleaned, repaired and/or replaced, as directed by the Engineer, at this Contractor's expense.
- B. Upon completion of his work this Contractor shall remove all his tools, equipment, surplus material, debris, etc., leaving the premises in an orderly and clean condition.

3.12 COORDINATION

- A. The General Contractor shall coordinate with other contractors as to providing sleeves, anchors, and pads, and other requirements that are necessary to complete construction. The General Contractor shall be responsible for placement of such items for the other contractors.

END OF SECTION

SECTION 033450  
CONCRETE JOINTS AND FINISHES

PART 1. GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, materials, equipment and incidentals required to install joints in concrete, sealants, waterstops, and accessories as shown on the Contract Drawings and specified herein. Concrete joints include construction, expansion, isolation and control joints and shall be of the type shown on the drawings and/or specified herein.

1.02 REFERENCE STANDARDS (Most Current Edition)

- A. American Concrete Institute (ACI)
  - 1. ACI 301 - Specifications for Structural Concrete for Buildings
  - 2. ACI 318 - Building Code Requirements for Reinforced Concrete
  - 3. ACI 315 (SP-66) - Details and Detailing of Concrete Reinforcement
  - 4. ACI 224 - Joints in Concrete Construction
- B. American Society for Testing and Materials
  - 1. ASTM C33 - Standard Specification for Concrete Aggregates
  - 2. ASTM A675 - Standard Specification for Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical Properties

1.03 DELIVERY, HANDLING AND STORAGE

- A. Deliver products in original, unopened containers displaying the manufacturer's label with product identification and batch number.
- B. Store products in accordance with manufacturer recommendations.

1.04 QUALITY ASSURANCE

- A. For concrete that will receive additional finishes, the surface shall be prepared in accordance with the manufacturer's product requirements.

PART 2. PRODUCTS

2.01 MATERIALS

- A. All materials used together in a given joint shall be compatible with one another. Coordinate material selection with suppliers and products to provide compatibility.

2.02 CONSTRUCTION JOINTS

- A. Construction joints for interruptions in slabs on grade concrete placements shall be fabricated from 18 gauge galvanized steel shaped to form a tongue and groove mechanical key joint. Preformed knock-out holes shall be provided at 6" on center. The unit shall be the same depth as the concrete. The units shall be the "Vulco Screed Joint 11" (free flow) as made by Vulcan, the "Tongue Groove" joint #95 as made by Heckmann, the "Keyed Kold Joint" as made by Burke, or equal. Units shall be staked a minimum of 2'-0" on center or more often as required.

2.03 EXPANSION, CONTRACTION AND ISOLATION JOINT

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CONCRETE JOINTS AND FINISHES

- A. Expansion, contraction and isolation joint filler shall be preformed, non-staining, and compatible with sealant and primer. Joint filler material shall be closed cell superior grade polyethylene or non-extruding PVC, such as Sonneborn "Vinylform", Serviced "Rodofoa 11" by W. R. Grace or equal.
- B. If of a supporting type, (supporting concrete) joint filler material shall be closed cell rigid foam, cork, or non-impregnated fiber board, such as Sonneborn ("Sonoflex Cork", Serviced "Standard Cork" filler by W. R. Grace Co.) or equal. Where sealant is to be applied, the joint filler or backer shall be compatible as a back-up material, with regard to the sealant not bonding to or being stained by the backup. If the joint filler is a material that will bond to the sealant, the polyethylene tape shall be used to cover the back up. The polyethylene shall be a type that will not bond to the sealant. Note that joint fillers shall be held back for sealants where possible.
- C. Sealant shall be in accordance with Section 03300

PART 3. EXECUTION

3.01 INSTALLATION OF ISOLATION JOINTS:

- A. Isolation joints for slabs on grade: The floor shall be separated structurally from other building elements to accommodate differential horizontal and vertical movement. Isolation joints shall be used at junction with walls, columns, machine foundations, and footings, or other points of restraint, such as drain pipes, chimneys, sumps, stairways, etc. Joint material shall be removed to the depth required for installation of the sealant. Isolation joints are shown on Contract Drawings.

3.02 INSTALLATION OF CONTRACTION JOINTS IN SLABS ON GRADE:

- A. Contraction joints shall be provided as shown on the drawings. In the event none are shown or are only partially shown, no slab larger than 20 feet shall be constructed without a control joint. All reinforcing steel shall be interrupted at the control joints with a 2" gap. Joints shall be formed either with a pre-molded joint insert or a sawcut. Cutting shall be done as early as possible and within 24 hours after the concrete has set. (Wait just long enough that the blade does not ravel the edges of the fresh concrete.) The saw shall be guided to insure straight cuts. The width of the cut shall be minimum of 1 1/4" and in depth 25% of the slab thickness. As an alternative to sawing, so called "Zip-Strips" may be used if they conform to the requirements for sawn joints. The joints shall be filled with a sealant as specified herein.

3.03 INSTALLATION OF EXPANSION JOINTS

- A. Expansion joints shall be provided as shown on the Drawings. In the event none are shown or are only partially shown, no element longer than 80 feet shall be constructed without an expansion joint.
- B. Reinforcement or other fixed items embedded or bonded into the concrete shall not be run through expansion joints. Provide appropriate expansion dowels as shown. Dress edges of concrete corners to provide a smooth, uniform edge. Thoroughly clean all expansion joints of dust, oil, grease, water, dirt, frost or other foreign materials immediately prior to sealing.
- C. The joints shall be filled with sealant as specified herein.

SECTION 033450  
CONCRETE JOINTS AND FINISHES

3.04 SLAB, WALL AND FLOOR FINISHES

A. The finish of all floors, slabs, flow channels, and tops of walls shall be accomplished by the contractor as described below, by types, and in accordance with the schedule outlined in the project documents. When type of finish is not specified in the project documents, the following finishes shall be used as applicable:

1. Type 1 - Scratched Finish: For surfaces intended to receive bonded applied cementitious applications.
2. Type 2 - Floated Finish: For surfaces intended to receive roofing, water proofing or tile membranes, or sand bed terrazzo.
3. Type 3 - Troweled Finish: For floors intended as walking surfaces, for reception of floor coverings, flow channels, tankage and all areas where in contact with liquids. All walls to have Type 3 finish.
4. Type 4 - Broom or Belt Finish: For sidewalks and ramps.
5. Type 5 - Nonslip Finish: For exterior platforms, steps, and landings; and for exterior and interior pedestrian ramps.
6. Type 6 - Rubbed Finish: Vertical concrete above grade exposed to view, underside of concrete slab exposed to view, interior tank walls exposed to view + 2' below low water level (rough form finish on submerged walls).

B. FINISHING TOLERANCES

Finishes with Class A tolerances shall be true planes within 1/8 inch in 10 feet, as determined by a 10-foot straightedge placed anywhere on the slab in any direction. Where drains are to be provided, pitch concrete surface to drains such that there are no low spots.

C. FINISHES

1. Type 1 - Scratched Finish: After the first floating to a Class C tolerance, the surface shall be roughened with stiff brushes or rakes before final set. (The procedure is same as Type 2 up to first floating.
2. Type 2 - Floated Finish: After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Preferably a magnesium float will be used. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, planeness of surface shall be checked with a 10-foot straightedge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce a surface within Class B tolerance throughout. The slab shall then be refloated immediately to a uniform sandy texture.
3. Type 3 - Troweled Finish: The surface shall first receive a Type 2 float finish. It shall next be power troweled, and finally hand troweled. The first troweling after power floating shall produce a smooth surface which is relatively free of defects but which may still show some trowel marks. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling operations. The finished surface shall be essentially free of trowel marks, uniform in texture and appearance and shall be planed to a Class A tolerance, except tolerance for concrete on metal deck shall be Class B. On surfaces intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding. If the concrete surface contains excess



SECTION 033450  
CONCRETE JOINTS AND FINISHES

alkaline, the Contractor shall acid etch the floor and wash same so that a proper bond can be achieved later between floor covering adhesive and the concrete.

4. Type 4 - Broom or Belt Finish: Immediately after the concrete has received a Type 2 float finish, it shall be given a course transverse scored texture by drawing a broom or burlap belt across the surface.
5. Type 5 - Nonslip Finish: Where the contract documents require a nonslip finish, the surface shall be given a "dry shave" application, as specified herein, of crushed ceramically bonded aluminum oxide. The rate of application of such material shall not be less than 50 pounds per 100 square feet.
6. Type 6 - Rubbed Finish: While the wall is still damp apply a thin coat of medium consistency neat cement slurry by means of bristle brushes to provide a bonding coat within all pits, air holes or blemishes in parent concrete. Avoid coating large areas with slurry at one time. Before the slurry has dried or changed color, apply a dry (almost crumbly) grout proportioned by volume and consisting of 1-part cement to 1.5 parts of clean masonry sand having a fineness modulus of approximately 2.3 and complying with the gradation requirements of ASTM C33 for such materials. Grout shall be uniformly applied by means of damp pads of coarse burlap. Scrub grout into the pits and air holes to provide a dense mortar in all imperfections. Allow the mortar to partially harden for 1-2 hours (weather dependent). If the air is hot and dry, keep the wall damp during this period using a fine / fog spray. When the grout has hardened sufficiently so it can be scraped from the surface with the edge of a steel trowel without damaging the grout in the small pits and holes removed, cut off all that can be removed with a trowel. Rub dried surface vigorously with clean dry burlap to completely remove dried grout. On the day following the repair of pits air holes and blemishes, the walls shall again be rubbed with dry, used, pieces of burlap. The walls shall be washed and scrubbed with a stiff bristle brush. The walls shall be sprayed with a fine fog for 3-days following this wash down.

END OF SECTION

SECTION 036000  
GROUT

PART 1. GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment and incidentals required to supply and place grout.

1.02 SUBMITTALS

- A. Submit in accordance with Section 01300, product data showing materials of construction and details of installation for:
  - 1. Commercially manufactured non-shrink cementitious grout. Include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations and surface preparations.
  - 2. Cement grout. Include the type and brand of cement, the gradation of fine aggregate, product data on any proposed admixtures and proposed grout mix.
- B. Qualifications:
  - 1. Submit documentation that grout manufacturers have at least 10 years experience in the production and use of the grouts proposed.
- C. Review of the submitted materials will not relieve the Contractor of responsibility for the strength, safety, or correctness of methods used.

1.03 REFERENCE STANDARDS (Most Current Edition)

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM C33 - Standard Specification for Concrete Aggregates
  - 2. ASTM C150 - Standard Specification for Portland Cement
  - 3. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
  - 4. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
- B. U.S. Army Corps of Engineers Standard (CRD)
  - 1. CRD-C621 - Corps of Engineers Specification for Non-shrink Grout

1.04 DELIVERY, HANDLING AND STORAGE

- A. Deliver products in original, unopened containers displaying the manufacturer's label with product identification and batch number.
- B. Store products in accordance with manufacturer recommendations.

PART 2. PRODUCTS

2.01 NON-SHRINK GROUT

- A. Non-shrink cementitious grout shall conform to ASTM C1107, Grade B or C and CRD-C621. Acceptable products are as follows:

SECTION 036000  
GROUT

1. General purpose non-shrink cementitious grout: SikaGrout 212 by Sika Corp.; Set Grout by Master Builders, Inc.; Euco NS by The Euclid Chemical Co.; NBEC Grout by Five Star Products, Inc. or equal.
2. Flowable non-shrink cementitious grout: Masterflow 928 by Master Builders; Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Five Star Grout by Five Star Products, Inc. or equal

2.02 CEMENT GROUT

- A. A mixture of one part Portland cement conforming to ASTM C150, Types I, II, or III and one to two parts sand conforming to ASTM C33 with sufficient water to place and work grout.

2.03 WATER

- A. Potable water

2.04 CONCRETE GROUT

- A. Concrete grout shall be concrete as specified in 03300 except with a maximum coarse aggregate size of 3/8".

PART 3. EXECUTION

3.01 PREPARATION

- A. Place grout over cured concrete that has obtained full design strength.
- B. Concrete surfaces to receive grout shall be clean, free of ice, frost, dirt, grease, oil, laitance, loose material and paint that could affect bonding.
- C. Grout shall be applied to a roughen surface.
- D. Wash concrete surface and keep moist for 24 hours prior to application of grout. Remove any excess water prior to placement of grout.

3.02 INSTALLATION

- A. Mix, apply and cure the grout product in accordance with manufacturer's recommendations and as stated herein.
- B. Take precautions to keep temperatures of the receiving concrete and the grout between 40° and 90° F for 24-hours after placement.
- C. Place expansion, contraction and isolation joints in the grout when placing grout over such.
- D. Add washed pea gravel to cement and non-shrink cementitious grout when depth exceeds 3".
- E. Keep grout moist and within recommended temperatures for a minimum of 24-hours after placement. Provide shade if in direct sunlight and wind screens as necessary to prevent excessive evaporation.

END OF SECTION

## **Division 05**



SECTION 055000  
METAL FABRICATIONS

PART 1 GENERAL

1.01 REFERENCES

- A. Standards: Comply with the following unless otherwise specified or indicated:
  - 1. Welding: "Structural Welding Code - Steel, AWS D 1.1:2000", by The American Welding Society (AWS Code).
  - 2. Design and Fabrication: "Construction Manual Series, Section 1, Specifications for Aluminum Structures, December, 1986", by the Aluminum Association, Incorporated (AAI Specification).
  - 3. Welding: "Structural Welding Code – Aluminum, AWS D1.2", by the American Welding Society (AWS Code).

1.02 SUBMITTALS

- A. Shop Drawings: Show fabrication details and connections to adjacent work. Furnish setting drawings and templates for installation of bolts and anchors in other work.
- B. Product Data: Manufacturer's catalog cuts, printed specifications, and installation instructions.

1.03 QUALITY ASSURANCE

- A. Galvanizing: Stamp galvanized items with galvanizer's name, weight of coating and applicable ASTM number.
- B. Alloy Identification: Mill mark aluminum material with allow and heat treatment designation.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Fabricate miscellaneous metal assemblies and components from the following applicable materials required to produce units conforming to the design and types of metal fabrications indicated.
  - 1. Steel Plates, Shapes and Bars: ASTM A 36.
  - 2. Hot-Rolled Carbon Steel Bars: ASTM A 575, Grade as selected by fabricator.
  - 3. Gray Iron Castings: ASTM A 48, Class 30.
  - 4. Steel Pipe: ASTM A 53; Type as selected; Grade A; black finish, except galvanized for exterior locations and elsewhere where indicated; standard weight (Schedule 40), unless otherwise indicated.
  - 5. Aluminum Castings: ASTM B 26 or ASTM B 108, Alloy 514.0, Temper as required.
  - 6. Aluminum Plate and Sheet: ASTM B 209, Alloy 3003, Temper H-16.
  - 7. Extruded Aluminum Shapes and Tubes: ASTM B 221 or ASTM B 308, Alloy 6061, temper as required.
  - 8. Rolled Bars and Rods: ASTM B 211.

SECTION 055000  
METAL FABRICATIONS

9. Rolled or Extruded Structural Shapes: ASTM B 308.
  10. Extruded Structural Pipe and Tube: ASTM B 429.
  11. Aluminum Grating: I-Bar, GIA Series or Aluminum Plank – HD Series Grating by McNichols or equivalent. Grating to be suitable to support the design loading indicated on drawings and 100 psf without exceeding  $\frac{1}{4}$ " deflection.
  12. Hot Dipped Galvanized Steel Grating: Rectangular bar grating with bearing bars  $1\frac{3}{16}$ " on center. Material to be carbon steel with hot dipped galvanized finish (after fabrication). Grating to be suitable to support the design loading indicated on drawings and 100 psf without exceeding  $\frac{1}{4}$ " deflection.
  13. Stainless Steel Grating: Rectangular bar grating with bearing bars  $1\frac{3}{16}$ " on center. Material to be stainless steel type 304. Grating to be suitable to support the design loading indicated on drawings and 100 psf without exceeding  $\frac{1}{4}$ " deflection.
  14. Stairway Treads: Stairway treads to be fabricated from rectangular bar grating with abrasive nosing in material to match stairway construction.
  15. Abrasive Nosing: Provide aluminum corrugated nosing for aluminum fabrications and cast iron abrasive nosing for carbon steel fabrications.
- B. Fasteners and Anchors: Furnish type, size, and grade required for fabrication and installation of the Work of this Section. Fasteners and anchors shall be cadmium plated steel for ferrous metals and stainless steel for non-ferrous metals unless otherwise indicated:
1. Standard Bolts: FS FF-B-575C, Type as required.
  2. Machine Screws: FS FF-S-92B, Type and Style as required.
  3. Machine Bolts:
    - a. ASME/ANSI B18.5, ASME/ANSI B18.9, or ASME/ANSI B18.18.1.
    - b. Type II, Class and Form as required.
  4. Nuts: FS FF-N-836E, Type and Style as required.
  5. Lag Bolts:
    - a. ASME/ANSI B18.2.1 or ASME/ANSI B18.18.1.
    - b. Type as required, Style 1, Grade B.
  6. Plain Washers: FS FF-W-92B, round, general assembly grade, carbon steel.
  7. Lock Washers: FS FF-W-84A, helical spring type carbon steel.
  8. Expansion Anchors:
    - a. FS A-A-1922, FS A-A-1923, FS A-A-1924, FS A-A-1925, FS A-A-55614, or FS A-A-55615.
    - b. Type and Style as required.
  9. Stainless Steel Fasteners: Type 316.
- C. Regalvanizing Paint: Single component giving 93 percent pure zinc in the dried film, and meeting the requirements of MIL-P-21035B (NAVY).
- D. Shop Paint: FS TT-P-615D, Type II.
  1. Shop Paint for Galvanized Steel: FS TT-P-641G, Type II.
- E. Bituminous Paint: Asphaltic Type, SSPC-Paint 12.

2.02 FABRICATION - GENERAL

SECTION 055000  
METAL FABRICATIONS

- A. Fabricate metal items of material, size, and thicknesses indicated. If not indicated, use material of required size and thickness to produce adequate strength and durability for the intended use of the finished product.
- B. Fabricate items intended to be exposed to view of material entirely free of surface blemish, including pitting, roller and seam marks, rolled trade names, or roughness. Remove surface blemishes by grinding or by welding and grinding, prior to cleaning, treating, and finishing.
- C. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the material.
- D. Weld corners and seams continuously. Grind exposed welds smooth and flush, to match and blend with adjoining surfaces.
- E. Form exposed connections with flush, smooth hairline joints. Use concealed fasteners wherever possible. Provide Phillips flathead (countersunk) screws or bolts for exposed fasteners unless otherwise indicated or specified.
- F. Prepare fabricated metal items for anchorage of the type indicated, coordinated with the supporting structure. Fabricate and space anchoring devices as indicated or as required to provide adequate support for the intended use of the Work.
- G. Cut, reinforce, drill, and tap fabricated metal items as required to receive finish hardware and other appurtenant items.
- H. Fabricate grating with banded edges and fastener attachments below the walking surface. Coordinate openings with other trades.
- I. Galvanizing: Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:
  - 1. ASTM A 123 for plain and fabricated material.
  - 2. ASTM A 153 for iron and steel hardware.
- J. Cleaning Aluminum: Thoroughly clean structural aluminum. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning".
  - 1. Etch aluminum surfaces if so recommended by the manufacturer of the shop paint (general).
- K. Shop Painting:
  - 1. Galvanized Items:
    - a. Galvanized items which are to be finish painted under Section 09900 shall be rinsed in hot alkali or in an acid solution and then in clear water.
    - b. Welded and abraded galvanized surfaces shall be wire brushed and repaired with a coating of cold galvanizing compound.



SECTION 055000  
METAL FABRICATIONS

- c. Do not paint galvanized items which are not to be finish painted under Section 09900.
- 2. Aluminum Items: Apply one coat of shop paint (general) to aluminum surfaces except as follows:
  - a. Do not shop paint aluminum surfaces to be field welded.
  - b. Apply 2 coats of shop paint, before assembly, to aluminum surfaces inaccessible after assembly, except surfaces in contact.
- 3. Apply coatings on dry surfaces in accordance with the manufacturer's printed instructions, and to the following minimum thickness per coat:
  - a. Shop Paint (General): 5.0 mils wet film.
  - b. Shop Paint for Galvanized Steel: 3.0 mils wet film.
  - c. Cold Galvanizing Compound: 2.0 mils dry film.
- L. Anodized Finish: Comply with the Standards For Anodized Architectural Aluminum by the Aluminum Association. Do not anodize aluminum surfaces within 3 inches of any surface to be field welded.
  - 1. Clear Anodized Finish: AA-M32A41, minimum 0.7 mil coating.

2.03 FLOOR GRATING

- A. Aluminum Grating: Aluminum grating to be Irving I-Bar aluminum type "IB" as manufactured by IKG Industries, Division of Harsco Corporation.
  - 1. Aluminum gratings: Bearing bars shall be alloy 6063-T6, conforming to ASTM B 221. Cross bars and bent connecting bars shall be of alloy 6063 conforming to ASTM B 221.
  - 2. Main bearing bars to be sizes as noted in typical grating detail and drawings spaced 1-3/16" center to center.
    - a. Cross bars to be spaced 4" center to center.
  - 3. Bearing bar webs shall be punched to receive the cross bars. Notching, slotting, or cutting the top or bottom flanges of bearing bars to receive cross bars will not be permitted.
  - 4. Cross bars shall be secured to the main bars by a swaging process to prevent turning, twisting or coming loose.
  - 5. Ends of cross bars are to be trimmed flush with outside face of flange of each bearing bar. Trim shall be made in a manner to prevent destruction of swaged lock on web of bearing bar.
  - 6. Stair tread grating to be same pattern as floor grating and have anti-slip aluminum corrugated nosing.
  - 7. Fasteners: see typical grating detail on drawings.
  - 8. Finish: Aluminum standard mill finish.
- C. Stairway Treads
  - 1. Material:
    - a. Aluminum.
  - 2. Styles and types of grating tread to match grating style.
  - 3. Size, span, and width of tread and bearing bars as noted on Drawings.
  - 4. Nosings shall be of a cast abrasive type for both steel and aluminum treads.
  - 5. Finish:
    - a. Aluminum standard mill finish.

SECTION 055000  
METAL FABRICATIONS

6. Provide serrated walking surface.
7. Depth of treads to be suitable to support a 400 lb concentrated load on nosing and 4 bearing bars at center of tread length.

2.04 SAFETY NOSINGS

- A. Nosings: Cast, abrasive non-slip type, of profiles indicated, extending full length of concrete treads or other concrete edges to be protected unless otherwise indicated. Equip each nosing with integrally cast, welded, or riveted anchors located not more than 4 inches from each end of nosing and intermediate anchors spaced not over 15 inches oc. Abrasive grain shall be integrally cast into the wearing surface.
  1. Metal: Cast Aluminum.
  2. Tread Nosing Units: 4 inches wide x 5/16 inch thick, with 1 inch minimum deep protective front lip.
  3. Surface Design: Cross-hatched abrasive.

2.05 TRENCH COVERS

- A. Acceptable Manufacturers:
  1. Neenah Foundry Company's R-4990 Series, heavy duty, Type L bolted trench frame with a Type A grated cover.
  2. Flockhart Foundry Company's Roadway Type 679 bolted trench frame with grating.
  3. Barry Pattern & Foundry Company's B-H20G Series, heavy duty, Type L bolted trench frame with Type A grates.
- B. Frames: Heavy duty rated, gray cast iron castings with continuous rabbet to receive grating cover, and with integrally cast tie-anchor lugs and anchors spaced not more than 24 inches oc. Furnish frame end piece at each end of trench, and tie bolts for tie-anchor lugs.
  1. Auxiliary Flat Bar Anchors: Steel bar anchors 3/16 inch thick x 1 inch wide x approximately 4 inches long, with 1-1/2 inch long bent end, and hole for tie bolt in other end. Furnish flat bar anchor at each pair of tie-anchor lugs and at the single tie-anchor lugs at trench ends, except at joints in concrete slab.
- C. Grated Covers: Heavy duty rated, gray cast iron castings fabricated into 2 feet long sections.
- D. Removable Dams: Steel plate, fabricated as shown, and galvanized.

PART 3 EXECUTION

3.01 PREPARATION

- A. Isolation: Isolate non-ferrous metal surfaces in contact with dissimilar metals, concrete, or masonry by coating non-ferrous surface with bituminous paint.

SECTION 055000  
METAL FABRICATIONS

3.02 INSTALLATION

- A. Fit and set fabricated metal items accurately, in designed locations, at proper elevation and alignment. Measure locations from approved established lines and levels.
- B. Fit exposed connections accurately to form tight hairline joints. Weld connections that are not intended to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind joints smooth. Cut off exposed threaded portions of bolts flush with nuts.
- C. Field Welding: Comply with AWS Code for the procedures for manual shielded arc welding, appearance and quality of welds and for the methods used in correcting welding work.
- D. Attached Work: Drill holes for fasteners with power tools to exact size required. Unless otherwise shown on the Drawings, fasten fabricated metal items to concrete and solid masonry with expansion anchors. Fasten fabricated metal items to hollow masonry and stud partitions with toggle bolts.
- E. Grating Attachments: Attach grating to support structure with recessed fasteners compatible with material utilized.

END OF SECTION

SECTION 055200  
ALUMINUM HANDRAILS AND RAILINGS

PART 1. GENERAL

1.01 SYSTEM DESCRIPTION

- A. Work under this Section shall consist of all labor, material, equipment and services necessary for or incidental to supply and install all pipe railings as specified herein, and shown on the Contract Drawings.

1.02 SUBMITTALS

- A. Shop Drawings:
  - 1. Shop drawings shall detail all welds, bends and connections for the installation of the railings.
  - 2. Plan showing layout including splices, attachments, and mounting.
  - 3. Indicate railings in related and dimensional position with scale elevations.
- B. Product Data and Test Results:
  - 1. Catalog data or design information.
    - a. Submit test data showing load, and deflection due to load, in enough detail to prove handrail system satisfies OSHA requirements.
    - b. Submit test data showing load, and deflection due to load, in enough detail to prove handrail system satisfies OSHA requirements.
    - c. Provide test data on base connections of types required for Project. Acceptance for use will not be granted without test data.

1.03 QUALITY ASSURANCE

- A. Manufacturer's test data and certification of structural integrity.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle components in manner preventing damage to finished surfaces.
- B. Pack tubes and elbows in individual plastic shrink film to protect finish. Do not remove until after installation.
- C. Storage of Materials:
  - 1. Store components in dry, clean location, away from uncured concrete and masonry.
  - 2. Cover with waterproof paper, tarpaulin or polyethylene sheeting.

PART 2. PRODUCTS

2.01 MANUFACTURERS

- A. Handrails provided shall be the product of a single manufacturer.
- B. Tuttle Aluminum & Bronze (TABCO Products).
- C. Approved equal.

2.02 MATERIALS

- A. All rails and posts shall be fabricated from #6063 alloy, extruded aluminum pipe, 1.90 inches O.D., schedule 40 handrail pipe. (U.N.O.) Mechanical connections, splice sleeves, etc., shall be #6063 alloy or #6061 alloy, and cast fittings shall be #214 alloy.

SECTION 055200  
ALUMINUM HANDRAILS AND RAILINGS

- B. Extensions:
    - 1. Fittings for open handrail extensions shall be of welded construction and welded to vertical posts to comply with OSHA loading requirements. Welds shall be ground smooth and finished to match manufacturer's finish.
    - 2. For wall mounted handrails, cantilevered extensions not permitted. Provide handrail wall fastener at end of handrail.
  - C. Chains: 3/16 in. minimum stainless steel link chain with spring actuated stainless steel clasp capable of withstanding 250 lb horizontal force.
  - D. Toe Plate: 1/4 in. thick by 4 in. high, flat aluminum, alloy 6063-T6, or "s" type aluminum plate 4 in. high, with clamp-on type connection.
- 2.03 FINISHES
- A. Aluminum Association Finish Designation: AA-M12A41 (Mechanical finish, non-specular, anodic coating, architectural Class I, clear coating 0.7 mil complying with AAMA 607.1 on exposed surfaces.
- 2.04 FASTENINGS
- A. Mechanical Fasteners: Stainless steel or aluminum.
  - B. Cement: Hydraulic, quick-setting, ASTM C595, factory-prepared with accelerator (CaCl<sub>2</sub> accelerator not acceptable).
- 2.05 FABRICATION
- A. Fabrication shall be performed in accordance with approved shop drawings by workmen thoroughly experienced in the fabrication and erection of metal railings. Contractor shall verify dimensions and check shop drawings against field dimensions.
  - B. The completed railing system, when properly installed, shall meet or exceed the load and design requirements of O.S.H.A., U.B.C., and other Local State, and Federal Agencies.
  - C. Completed railing systems shall be capable of withstanding a 200 pound force applied in any direction at any point of the top rail.
  - D. Form exposed bends with smooth, long radius bends, accurate angles and surfaces, with straight, sharp edges.
  - E. Form exposed edges to a radius of approximately 1/32" unless otherwise indicated. Use flush type fittings with joints, all smooth welded construction.
  - F. Form connections and changes in rail direction by using prefabricated fittings or radius bends. Secure rails with flange or bar fittings and bolts.
  - G. Weld corners and seams continuously in accordance with AWS recommendations. Welds to be smooth and flame dressed, to match and bend with adjoining surfaces.
  - H. Space vertical posts not more than 4-ft apart. Provide intermediate rail midway between top rail and floor. Install with full-running toe board.
  - I. Fabricate joints to exclude water or provide weep holes where water may accumulate.
  - J. All traffic surfaces shall be finished with a non-skid tread.
  - K. All stairs shall be equipped with handrails on either side.

SECTION 055200  
ALUMINUM HANDRAILS AND RAILINGS

PART 3. EXECUTION

3.01 INSTALLATION

- A. All materials shall be plumb, square, true, and level, and shall be anchored securely. All miters and field cuts shall be smoothed after joining. Where railing materials are placed in contact with dissimilar materials, the railing surface shall be protected by material as recommended by the railing manufacturer.
- B. Install all railings in accordance with approved shop drawings, installation details, and manufacturer's instructions to provide a complete installation that is firmly mounted, level, and is in true alignment with established lines or structure. All fasteners shall be drawn tight, and all grout set posts installed with non shrink waterproof grout. All components shall be thoroughly cleaned as recommended by railing manufacturer.
- C. Apply bitumastic coating to aluminum sleeves cast in concrete.
- D. All railing sections shall, where shown, be constructed with posts set in floor sleeves and secured with lock nuts to allow removal of railing sections if needed.
- E. Assemble and install in accordance with manufacturer's written instructions.
- F. Expansion Joints (Exterior Only):
  - 1. General:
    - a. Provide at intervals of not more than 30 ft oc.
    - b. Locate joints within 12 in. of posts.
    - c. Design for temperature differential of 75°.
  - 2. Railings:
    - a. Provide slip joint with internal sleeve extending 2 in. beyond each side of joint.
    - b. Toe Plate: Provide slip joint.

END OF SECTION

SECTION 055200  
ALUMINUM HANDRAILS AND RAILINGS

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## **Division 06**





## SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

**TIPS:**

To view non-printing **Editor's Notes** that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on MasterWorks/Supporting Information.

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Roof curbs [**cants**] [**and**] [**perimeter nailers**].
2. Blocking in [**wall**] [**and**] [**roof**] openings.
3. Wood furring and grounds.
4. Concealed wood blocking for support of [**toilet and bath accessories**] [**wall cabinets**] [**wood trim**] [**and**] <\_\_\_\_\_.>.
5. Telephone and electrical panel backboards.
6. Preservative treatment of wood.

## B. Related Requirements:

1. Section <\_\_\_\_\_ - \_\_\_\_\_>: Concrete openings to receive wood blocking.
2. Section <\_\_\_\_\_ - \_\_\_\_\_>: Masonry openings to receive wood blocking.
3. Section <\_\_\_\_\_ - \_\_\_\_\_>: [**Wood**] [**Metal**] roof decking to receive wood curbs [**and cants**].
4. Section <\_\_\_\_\_ - \_\_\_\_\_>: [**Window**] [**Door**] <\_\_\_\_\_> openings to receive wood blocking.

## 1.2 REFERENCE STANDARDS

## A. American National Standards Institute:

1. ANSI A208.1 - Mat-Formed Wood Particleboard.

## B. American Wood Protection Association:

1. AWP A M4 - Standard for the Care of Preservative-Treated Wood Products.
2. AWP A U1 - Use Category System: User Specification for Treated Wood.

## C. ASTM International:

1. **ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.**
2. **ASTM A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.**
3. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
5. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

D. California Department of Health Services:

1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

E. Forest Stewardship Council:

1. FSC Guidelines - Forest Stewardship Council Guidelines.

F. The Redwood Inspection Service:

1. RIS - Standard Specifications for Grades of California Redwood Lumber.

G. Southern Pine Inspection Bureau:

1. SPIB - Standard Grading Rules for Southern Pine Lumber.

H. U.S. Department of Commerce National Institute of Standards and Technology:

1. DOC PS 1 - Construction and Industrial Plywood.
2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
3. DOC PS 20 - American Softwood Lumber Standard.

I. West Coast Lumber Inspection Bureau:

1. WCLIB - Standard Grading Rules for West Coast Lumber.

J. Western Wood Products Association:

1. WWPA 2011 Western Lumber Grade Rules, including supplements.

### 1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit technical data and application instructions on wood-preserved and fire-retardant treatment materials.

#### 1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify that the following products meet or exceed specified sustainable design requirements.
  - 1. Materials Resources Certificates:
    - a. Certify source for regional materials and distance from Project Site.
    - b. Certify lumber is harvested from Forest Stewardship Council Certified well-managed forest.
  - 2. Indoor Air Quality Certificates:
    - a. Certify each composite wood [**and agrifiber**] product contains no added urea formaldehyde resins.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
  - 1. Provide cost data for the following products:
    - a. Regional products.
    - b. Certified wood products.
    - c. <\_\_\_\_>.

#### 1.5 QUALITY ASSURANCE

- A. Perform Work according to following:
  - 1. Lumber Grading Agency: Certified by [**DOC PS 20**] <\_\_\_\_>.
  - 2. Wood Structural Panel Grading Agency: Certified by [**APA - The Engineered Wood Association**] <\_\_\_\_>.
  - 3. Lumber: DOC PS 20.
  - 4. Wood Structural Panels: DOC PS 1 or DOC PS 2.
- B. Surface-Burning Characteristics:
  - 1. Fire-Retardant-Treated Materials: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- C. Apply label from agency approved by authority having jurisdiction to identify each [**preservative-treated**] [**and**] [**fire-retardant-treated**] material.
- D. Perform Work according to <\_\_\_\_> standards.
- E. Maintain <\_\_\_\_> [**copy**] [**copies**] of each standard affecting the Work of this Section on-Site.

## PART 2 - PRODUCTS

## 2.1 SUSTAINABILITY CHARACTERISTICS

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design compliance.
- B. Material and Resources Characteristics:
  - 1. Regional Materials: Furnish materials extracted, processed, and manufactured within **500 miles (800 km)** of Project Site **[including:]** [.]
    - a. <\_\_\_\_>.
  - 2. Certified Wood Materials: Furnish wood materials certified according to FSC Guidelines **[including:]** [.]
    - a. <\_\_\_\_>.
- C. Indoor Environmental Quality Characteristics:
  - 1. Composite Wood **[and Agrifiber]** Products: Maximum volatile organic compound content according to product and testing requirements of CA/DHS/EHLB/R-174.
- D. Indoor Environmental Quality Characteristics:
  - 1. **[Interior]** Composite Wood **[and Agrifiber]** Products: Contain no added urea formaldehyde resins.

## 2.2 MATERIALS

- A. Lumber Grading Rules: **[RIS]** **[SPIB]** **[WCLIB]** **[WWPA G-5]** <\_\_\_\_>.
- B. Miscellaneous Framing: **[Stress Group A,]** **[Stress Group D,]** **[Stress Group <\_\_\_\_>,]** **[<\_\_\_\_> species,]** <\_\_\_\_> grade; **[19]** <\_\_\_\_> percent maximum moisture content **[after treatment]** [, **pressure-preservative treated**].
- C. Plywood: APA**[-rated sheathing]** **[Structural I]**, Grade **[C-D]** <\_\_\_\_>; Exposure Durability **[1]** **[2]**; **[sanded]** **[unsanded]**.
- \*\*\*\*\* **[OR]** \*\*\*\*\*
- D. Particleboard: **[ANSI A208.1]** **[APA waferboard]** **[oriented strand board]** **[structural particleboard]**; wood **[chips]** **[shavings]** **[flakes]** set with waterproof resin binder; <\_\_\_\_> grade; **[sanded]** **[unsanded]** faces.

## 2.3 FACTORY WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): [**AWPA U1, commodity specification A-sawn products or F-wood composites**] using [**waterborne**] [**ACQ**] [**SBX**] <\_\_\_\_> preservative.
- B. Wood Preservative (Surface Application): [**Clear**] [**Colored**], <\_\_\_\_> type, manufactured by <\_\_\_\_>.
- C. Fire-Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested according to ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20-minute period, interior type.
- D. Moisture Content after Treatment: [**Re-dried**] [**Kiln dried (KDAT)**].
  - 1. Lumber: Maximum 19 percent.
  - 2. Structural Panels: Maximum 15 percent.

## 2.4 ACCESSORIES

- A. Fasteners and Anchors:
  - 1. Fasteners: [**ASTM A153 (A153M), hot-dip galvanized**] [**ASTM B695, Class 55 mechanically galvanized**] [**stainless**] steel for high-humidity and treated wood locations, unfinished steel elsewhere.
  - 2. Nails and Staples: ASTM F1667.
  - 3. Anchors: [**Toggle bolt type for anchorage to hollow masonry**] [**Expansion shield and lag bolt type for anchorage to solid masonry or concrete**] [**Bolt or ballistic fastener for anchorages to steel**].

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that substrate conditions are ready to receive blocking, curbing, and framing.

### 3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Coordinate placement of blocking, curbing, and framing items.

### 3.3 INSTALLATION

- A. Set members level and plumb, in correct position.
- B. Place horizontal members, crown side up.
- C. Construct curb members of solid wood sections.
- D. Curb roof openings [**except where prefabricated curbs are provided**]. Form corners by alternating lapping side members.
- E. Coordinate curb installation with installation of [**decking and support of deck openings**] [**roofing vapor retardant**] [**parapet construction**] [**and**] <\_\_\_\_>.
- F. Space framing [**and furring**] [**16**] [**24**] <\_\_\_\_> inches ([**400**] [**600**] <\_\_\_\_> mm) o.c.
- G. Secure sheathing to framing members with ends over firm bearing and staggered.
- H. Install telephone and electrical panel backboards with [**plywood**] <\_\_\_\_> sheathing material where required. Size backboards [**12**] <\_\_\_\_> inches ([**300**] <\_\_\_\_> mm) beyond size of electrical and telephone panel.

### 3.4 SITE-APPLIED WOOD TREATMENT

- A. Brush-apply [**one coat**] [**two coats**] of preservative treatment on wood in contact with [**cementitious materials**] [**roofing and related metal flashings**] [**and**] <\_\_\_\_>.
- B. Treat Site-sawn cuts. Apply preservative to Site-sawn cuts according to [**AWPA M4**] <\_\_\_\_>.
- C. Allow preservative to dry prior to erecting members.

### 3.5 ATTACHMENTS

- A. Roof Blocking: Spruce, pine, or fir species; 19 percent maximum moisture content; pressure-preservative treatment.
- B. Telephone and Electrical Panel Boards: 3/4 inch (19 mm) thick, square edges, site-brush-applied preservative treated.

END OF SECTION 061053

## **Division 07**





SECTION 072100  
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Foam-plastic board insulation.
2. Weather barrier membrane (building wrap).

B. Related Sections:

1. Section 075423 "TPO Roofing" for insulation specified as part of roofing construction.
2. Section 092900 "Gypsum Board" for installation of acoustical blankets in metal-framed assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1. For proprietary building-wrap weather barrier, submit data substantiating compliance with building code in effect for Project.

B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.

SECTION 072100  
THERMAL INSULATION

3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.
- C. Do not leave weather barrier exposed to weather for more than 120 days.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
  1. Basis of Design Product: Styrofoam Brand SM Insulation by DuPont (formerly Dow) or equal products by one of the following:
    - a. DiversiFoam Products.
    - b. Owens Corning.
  2. Type IV, 25 psi (173 kPa).
  3. Thickness: As indicated on Drawings for each application.
  4. Edges: Square edge or shiplap edge boards, manufacturer's standard for thicknesses required.
  5. Applications: Below grade applications, and under stucco systems.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
  1. Basis of Design Product: Provide Thermax (ci) Exterior Insulation by DuPont (formerly Dow) or equal products by one of the following.
    - a. Atlas Roofing Corporation.
    - b. Rmax, Inc.
  2. Thickness: As indicated on Drawings for each application.
  3. Facing:
    - a. Foil faced both sides, where indicated
    - b. Unfaced, where indicated..
  4. Edges: Square edge or shiplap edge boards, manufacturer's standard for thicknesses required.
  5. Application: Exterior wall sheathing.
- C. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
  1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

SECTION 072100  
THERMAL INSULATION

2.2 WEATHER BARRIER MEMBRANE

- A. Building Wrap: Spunbonded polyolefin, non-woven, non-perforated, weather barrier with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; and UV stabilized.
  - 1. Basis of Design Product: DuPont; Tyvek CommercialWrap, or approved equal.
- B. Weather Barrier Tape: Oriented polypropylene film coated with a permanent acrylic adhesive; DuPont Tyvek Tape, or equal.
- C. Self-Adhering Flashing Tape: Provide DuPont StraightFlash straight flashing tape and FlexWrap flexible flashing tape, consisting of Tyvek polyethylene film and butyl sealant; at window and door heads and where indicated.
- D. Fasteners: Type required for substrate being fastened to.

2.3 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
  - 1. Products: Subject to compliance with requirements, provide one of the following or equal:
    - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
    - b. Eckel Industries of Canada; Stic-Klip Type N Fasteners
    - c. Gemco; Spindle Type.
  - 2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
  - 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.
- B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
  - 1. Products: Subject to compliance with requirements, provide one of the following or equal:
    - a. Gemco; 90-Degree Insulation Hangers.
  - 2. Angle: Formed from 0.030-inch- (0.762-mm-) thick, perforated, galvanized carbon-steel sheet with each leg 2 inches (50 mm) square.
  - 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

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- C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.
  - 1. Products: Subject to compliance with requirements, provide one of the following or equal:
    - a. AGM Industries, Inc.; RC150 or SC150.
    - b. Gemco; Dome-Cap, R-150 or S-150.

2.4 MISCELLANEOUS MATERIALS

- A. Cement board protection board.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or weather barriers, including removing projections capable of puncturing weather barriers, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions. Extend insulation to dimension below exterior grade line as indicated.
  - 1. Where below grade insulation is installed over drainage protection board and installed waterproofing membrane, install boards vertically, loose laid.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

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3.4      INSTALLATION OF INSULATION FOR FRAMED AND FURRED CONSTRUCTION

- A.    Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B.    Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

3.5      INSTALLATION OF INSULATION FOR CONCRETE SUBSTRATES

- A.    Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
  - 1.    Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
  - 2.    Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
  - 3.    After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
  - 4.    Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

3.6      INSTALLATION OF WEATHER BARRIER MEMBRANE

- A.    Cover insulation with weather barrier membrane where indicated on Drawings according to manufacturer's written instructions.
  - 1.    Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers
  - 2.    Provide overlaps as per manufacturer's recommendations. Tape all vertical and horizontal seams.
  - 3.    Install accessories including flashing tapes as per manufacturer's recommendations to seal all penetrations and openings in weather barrier, including all window and door openings.

3.7      PROTECTION

- A.    Protect installed insulation and weather barrier from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

SECTION  
072100 THERMAL

END OF SECTION 072100

SECTION 072713  
MODIFIED BITUMINOUS SHEET AIR AND MOISTURE BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes self-adhering, vapor-retarding, modified bituminous sheet air and moisture barriers.

1.2 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review air-barrier requirements and installation, special details, mockups, air-barrier protection, and work scheduling that covers air barriers.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
  - 1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 2. Include details of interfaces with other materials that form part of air barrier.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.



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1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to set quality standards for materials and execution.
  - 1. Install sheet membrane air barriers system on approximately 25 sq ft of exterior wall surface where directed by the Architect to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
    - a. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
    - b. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
  - 1. Protect substrates from environmental conditions that affect air-barrier performance.
  - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.9 WARRANTY

- A. Manufacturer's Warranty: Submit manufacturer's standard warranty form for sheet systems, include affirmation of waterproofing mock-up observation and approval as required by warranty provisions. Approval by manufacturer for warranty is required prior to system application. Submit manufacturer's "Request Form" and supporting documentation at completion of waterproofing application through the local Authorized Distributor of the materials.
  - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Special Installer's Warranty: Installer's standard form in which installer agrees to repair or replace sheets that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

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MODIFIED BITUMINOUS SHEET AIR AND MOISTURE BARRIERS

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) when tested according to ASTM E 2357.

2.3 SELF-ADHERING SHEET AIR BARRIER

- A. Modified Bituminous Sheet: 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick, cross-laminated polyethylene film with release liner on adhesive side and formulated for application with primer that complies with VOC limits.

1. Products; Synthetic Polymer Membrane:

- a. Basis of Design Product: Provide Carlisle Coatings and Waterproofing CCW-705 or one of the following:
- 1) GCP Applied Technologies: Perm-A-Barrier Wall Membrane.
  - 2) Henry Company; Blueskin SA
  - 3) Tremco; ExoAir 110.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
- b. Vapor Permeance: Maximum 0.1 perms (5.8 ng/Pa x s x sq. m); ASTM E 96/E 96M.
- c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
- d. Tensile Strength: Minimum 250 psi (1.7 MPa); ASTM D412, Die C
- e. Puncture Resistance: Minimum 40 lbf (180 N); ASTM E154/E154M.
- f. Water Absorption: Maximum 0.15 percent weight gain after 48-hour immersion at 70 deg F (21 deg C); ASTM D570.

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2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, cross-laminated polyethylene film with release liner backing.
- D. Butyl Strip: Vapor retarding, 30 to 40 mils (0.76 to 1.0 mm) thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.
- E. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.
- F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer
- I. Modified Bituminous Transition Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- J. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."
- K. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

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2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
  3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge isolation joints, expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 INSTALLATION

- A. Install materials according to air-barrier manufacturer's written instructions and details and according to recommendations in ASTM D6135 to form a seal with adjacent construction and ensure continuity of air and water barrier.
  1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous air-barrier sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F (16 deg C).
  2. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.

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- B. Prepare, treat, and seal inside and outside corners and vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D6135.
- C. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.
- D. Apply and firmly adhere air-barrier sheets over area to receive air barrier. Accurately align sheets and maintain uniform 2--inch- (50-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.
  - 1. Apply sheets in a shingled manner to shed water.
  - 2. Roll sheets firmly to enhance adhesion to substrate.
- E. Apply continuous air-barrier sheets over accessory strips bridging substrate cracks, construction, and contraction joints.
- F. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- (150-mm-) wide, transition strip.
- G. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- H. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.
  - 1. Coordinate air-barrier installation with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.
- I. Connect and seal exterior wall air-barrier sheet continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- J. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.
- K. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- L. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip or preformed silicone extrusion so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of contact over firm bearing to perimeter frames, with not less than 1 inch (25 mm) of full contact.
  - 1. Transition Strip: Roll firmly to enhance adhesion.

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- 2.     Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.
- M.    Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- N.    Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches (150 mm) beyond repaired areas in all directions.
- O.    Do not cover air barrier until it has been tested and inspected by testing agency.
- 3.4    Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.
- 3.5    FIELD QUALITY CONTROL
  - A.    Testing Agency: Owner may engage a Project Inspector to perform inspections.
  - B.    Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
    - 1.    Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
    - 2.    Continuous structural support of air-barrier system has been provided.
    - 3.    Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
    - 4.    Site conditions for application temperature and dryness of substrates have been maintained.
    - 5.    Maximum exposure time of materials to UV deterioration has not been exceeded.
    - 6.    Surfaces have been primed, if applicable.
    - 7.    Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
    - 8.    Termination mastic has been applied on cut edges.
    - 9.    Strips and transition strips have been firmly adhered to substrate.
    - 10.   Compatible materials have been used.
    - 11.   Transitions at changes in direction and structural support at gaps have been provided.
    - 12.   Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
    - 13.   All penetrations have been sealed.
  - C.    Air barriers will be considered defective if they do not pass tests and inspections.
    - 1.    Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
  - D.    Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

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3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
  - 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 072713

SECTION 076200  
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes sheet metal flashing and trim in the following categories:
  - 1. Metal flashing.
  - 2. Reglets.
  - 3. Fascia.
  - 4. Gravel stop.
  - 5. Coping
  - 6. Metal trim.
  - 7. Gutters and leaders
  - 8. Metal edge securement for roofing.
- B. Related Work Specified Elsewhere:
  - 1. Metal trim pieces, copings and flashing for metal siding and soffit panels are specified in Section 074213.13.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Low-slope membrane roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Building Code of NY, Chapter 16 and tested for resistance in accordance with ANSI/SPRI ES-1.
  - 1. Fabricate and install roof edge flashing, metal edge securement, fascia, copings and gravel stops capable of resisting the wind loads as indicated on Structural Drawings.
- C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

1.3 ACTION SUBMITTALS



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- A. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.
- B. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.
- C. Samples for Verification: Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.
  - 1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.
  - 2. 12-inch- (300-mm-) long samples of factory-fabricated products exposed as finished Work and accessories, as specified below.
    - a. Gutters
    - b. Downspouts.
    - c. Fascia
    - d. Gravel stop
    - e. Coping

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for gravel stops, fascia, roof-edge securement and flashings.
- C. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.6 PROJECT CONDITIONS

SECTION 076200  
SHEET METAL FLASHING AND TRIM

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

1.7 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- B. Performance Warranty: Include gravel stops, coping, fascia and roof edge flashings and securement in Total System Warranty provided by roofing membrane manufacturer; refer to Section 075423.

PART 2 - PRODUCTS

2.1 METALS

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
  - 1. Aluminum Sheet: ASTM B 209, Alclad 3003-H14, with a minimum thickness as indicated.
  - 2. Extruded Aluminum: ASTM B 221, alloy 6063-T52, with a minimum thickness of 0.080 inch for primary legs of extrusions, unless otherwise indicated.
- B. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ55 coating designation; structural quality.
  - 1. Exterior Finish: Bare acrylic coated Galvalume; "Galvalume Plus."

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- B. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.

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- C. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- D. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 07 Section "Joint Sealants."
- E. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.
- F. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- G. Felt Underlayment: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- H. Slip Sheet: 3-lb. rosin-sized building paper or Tyvek by DuPont.
- I. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mils (1.0 mm) thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - 1. Product: Ice and Water Shield by GCP Applied Technologies or equal.
- J. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
- K. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.3 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. General: Provide items designed and fabricated to fit applications indicated and to perform optimally with respect to weather resistance, water tightness, durability, strength, and uniform appearance.
- B. Expansion Provisions: Fabricate running lengths to allow controlled expansion not only for movement of metal components in relationship to one another but also to adjoining dissimilar materials, including flashing and roofing membrane materials, in a manner sufficient to prevent water leakage, deformation or damage.
- C. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.
  - 1. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

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2. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
  3. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
  4. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
  5. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of the counterflashing lower edge.
  6. Material: Fabricate reglets from the following metal, in thickness indicated:
    - a. Stainless steel, 0.020 inch thick.
  7. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Fry Reglet Corporation.
    - b. Hickman: W.P. Hickman Co.
    - c. Keystone Flashing Company.
- D. Hanging Gutters: Provide gutters in profile and size indicated on the Drawings, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of two times size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
1. Basis of Design Product: Box gutters manufactured by Mule-Hide Products, or equal.
  2. Gutters shall be provided by TPO roofing manufacturer, or shall be from a company approved by the TPO roofing manufacturer, and shall be included in the total roof warranty for TPO roofing.
  3. Gutter Material: Galvalume 24 gauge.
  4. Finish: Bare acrylic coated Galvalume; "Galvalume Plus."
- E. Downspouts: Provide downspouts in profile and size indicated on the Drawings, complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Basis of Design Product: Rectangular downspouts manufactured by Mule-Hide Products, or equal.
  2. Downspouts shall be provided by TPO roofing manufacturer, or shall be from a company approved by the TPO roofing manufacturer, and shall be included in the total roof warranty for TPO roofing.
  3. Downspout Material: Galvalume 24 gauge.
  4. Finish: Bare acrylic coated Galvalume; "Galvalume Plus."
- F. Copings: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding 10 feet (3.3 m), concealed anchorage; corner units, end cap units, and concealed splice plates with same finish as coping caps.

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1. Basis of Design Product: Snap Coping manufactured by Mule-Hide Products, or equal.
2. Copings shall be provided by TPO roofing manufacturer, or shall be from a company approved by the TPO roofing manufacturer, and shall be included in the total roof warranty for TPO roofing.
3. Coping Material: Galvalume 24 gauge.
4. Finish: Bare acrylic coated Galvalume; "Galvalume Plus."
5. Corners: Factory mitered and continuously welded
6. Coping-Cap Attachment Method: Snap-on, fabricated from coping-cap material .
7. Snap-on-Coping Anchor Plates: Concealed, galvanized-steel sheet, with integral cleats.
8. Vertical Face and Back Leg Height: As indicated on Drawings.

2.4 FABRICATION, GENERAL

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams in Aluminum: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- C. Seams in Steel: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches (600 mm )of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25.4 mm) deep, filled with mastic sealant (concealed within joints.)
- E. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- F. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- G. Conceal fasteners and expansion provisions unless noted otherwise. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

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- H. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
  - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.5 SHEET METAL FABRICATIONS

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- B. Miscellaneous Exposed Trim: Fabricate from the following material:
  - 1. Aluminum (administration building): 0.040 inch (1 mm) thick
  - 2. Galvalume (headhouse): 24 gauge
- C. Fascia, Gravel Stop, Base Flashing: Fabricate from the following material:
  - 1. Aluminum: 0.040 inch (1 mm) thick
- D. Counterflashing, Flashing Receivers: Fabricate from the following material:
  - 1. Aluminum: 0.032 inch (0.813 mm) thick

2.6 ALUMINUM FINISHES

- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.
- B. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 1. Fluoropolymer 3-Coat System: Manufacturer's standard 3-coat thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color topcoat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.
  - 2. Colors: Match existing
- C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2.7 METALLIC COATED STEEL FINISHES

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- A. Metallic-Coated Steel Sheet: Bare acrylic coated Galvalume; "Galvalume Plus."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Roof-Edge Flashings and Edge Securement: Secure metal flashings and edge securement at roof edges according to Building Code of NY, Chapter 16 for specified wind zone.
- D. Isolation: Where metal surfaces of units are installed in contact with dissimilar metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation as recommended by sheet metal producer.
- E. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- F. Sealed Joints: Form nonexpansion, but movable, joints in aluminum to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
1. Use joint adhesive for nonmoving joints specified not to be soldered.

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- G. Seams in Aluminum: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- H. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
  - 1. Underlayment: Where installing copper or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper over one layer of felt underlayment before installing sheet metal.
  - 2. Bed flanges in a thick coat of roofing cement where required for waterproof performance.
- I. Install reglets to receive counterflashing according to the following requirements:
  - 1. Where reglets are shown in concrete, furnish reglets for installation under Division 03 Section "Cast-in-Place Concrete."
  - 2. Where reglets are shown in masonry, furnish reglets for installation under Division 04 Sections.
- J. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.
- K. Copings: Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners. Anchor copings to meet performance requirements.
  - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
- B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 076200



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SECTION 079200  
JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants for the following locations:
1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:
    - a. Control and expansion joints in cast-in-place concrete
    - b. Joints in metal panel wall surfaces.
    - c. Perimeter joints between materials listed above and frames of doors, louvers and windows.
    - d. Control and expansion joints in ceiling and overhead surfaces.
    - e. Other joints as indicated.
  2. Exterior joints in the following horizontal traffic surfaces:
    - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    - b. Other joints as indicated.
  3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors.
    - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - f. Other joints as indicated.
  4. Interior joints in the following horizontal traffic surfaces:
    - a. Control and expansion joints in cast-in-place concrete slabs.
    - b. Other joints as indicated.
- B. Related Sections include the following:
1. Sealants used in glazing are specified in Division 08 "Glazing."
  2. Coordinate work of this section with all sections referencing it.

1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 ACTION SUBMITTALS

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- A. Product Data: For each joint-sealant product indicated.
- B. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- C. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch (13-mm) wide joints formed between two 6-inch (150-mm) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.4 INFORMATIONAL SUBMITTALS

- A. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.
- B. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project names addresses, names of Architects and Owners, plus other information specified.
- C. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
- D. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.
- E. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.
- F. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who has successfully completed at least three (3) joint sealer applications similar in type and size to that of this project within the last five (5) years. All workers used for work of this Section shall be experienced in the techniques of sealant application and shall be completely familiar with the published recommendations of the manufacturer of the joint sealant materials being used.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Field Testing: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:
  - 1. Locate test joints where indicated or, if not indicated, as directed by Architect.
  - 2. Conduct field tests for each application indicated below:
    - a. Each type of elastomeric sealant and joint substrate indicated.

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- b. Each type of non-elastomeric sealant and joint substrate indicated.
  - 3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
  - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
  - 5. Test Method: Test joint sealants by hand pull method described below:
    - a. Install joint sealants in 60 inches (1500 mm)) joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
    - b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches (50 mm) long at side of joint and meeting horizontal cut at top of 2-inch (50-mm) cuts. Place a mark 1 inch (25 mm) from top of 2-inch (50-mm) piece.
    - c. Use fingers to grasp 2-inch (50-mm) piece of sealant just above 1-inch (25-mm) mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
  - 6. Report whether or not sealant in joint 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.
  - 7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
  - D. Random Field Tests: Periodically test sealants, in place, for adhesion, using methods recommended by sealant manufacturer. Promptly replace any sealant that does not adhere, fails to cure, or fails to perform as specified by the sealant manufacturer.
  - E. Field Water Test: Perform two field water tests on completed areas including as many conditions as possible. If leakage occurs during testing, repair as required, and re-test area and also test two additional locations.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
  - B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.
- 1.7 PROJECT CONDITIONS
- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
    - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4 deg C).
    - 2. When joint substrates are wet.

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- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

- B. Manufacturer's Warranty: Provide written warranty agreeing to repair or replace, at no cost to Owner, defective materials for twenty (20) years, and workmanship for two (2) years from the Date of Substantial Completion. Defective materials and workmanship shall include, but are not limited to:

- 1. Deterioration, aging or weathering of the work;
- 2. Water leakage and/or air leakage;
- 3. Sealant loss of adhesion, loss of cohesion, cracking or discoloration;
- 4. Staining or discoloration of adjacent surfaces;
- 5. Joint failure due to building or joint movement up to the limits prescribed by the manufacturer;
- 6. Cracks or bubbles on sealant surface.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
  - 1. Provide selections made by Architect from manufacturer's standards or custom colors to match Architect's samples, as directed by Architect.
- C. Additional Movement Capability: Where additional movement capability is specified, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920

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for Uses indicated.

- D. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- E. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project

2.2 LATEX JOINT SEALANT

- A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part, nonsag, mildew-resistant, paintable latex acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior locations involving joint movement of not more than plus or minus 5 percent.
1. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include, but are not limited to, the following:
    - a. AC-20; Pecora Corporation.
    - b. Tremflex 834; Tremco.
    - c. ALEX PLUS; DAP .
- B. Uses: General interior use, paintable.

2.3 MILDEW-RESISTANT SILICONE JOINT SEALANT

- A. Single-Component Mildew-Resistant Silicone Sealant: Manufacturer's standard, non-modified, one-part, silicone sealant; complying with ASTM C 920, Type S, Grade NS, Class 25, Uses NT, G, A, and, as applicable to non-porous joint substrates indicated, O. Formulate sealant with fungicide and specifically intended for sealing interior joints with nonporous substrates and subject to in-service exposure to conditions of high humidity and temperature extremes.
1. Available Products: Subject to compliance with requirements, silicone joint sealants that may be incorporated in the Work include, but are not limited to, the following:
    - a. 786 Mildew Resistant; Dow Corning.
    - b. Sanitary 1700; GE Silicones.
    - c. 898 Silicone Sanitary Sealant; Pecora Corporation.
    - d. Tremsil 600 White; Tremco.
- B. Uses: Interior use in wet locations, and all toilet rooms.

2.4 NONSAG URETHANE JOINT SEALANT

- A. Multicomponent Nonsag Urethane Sealant: Manufacturer's standard, non-modified, multi-part,

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nonsag urethane sealant; complying with ASTM C 920, Type M, Grade NS, Class 25, Uses NT, M, G, A, and as applicable to joint substrates indicated, O.

1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
  - a. Dynatrol II, Pecora Corporation
  - b. Sikaflex-2c NS, Sika Corporation
  - c. Dymeric 240FC; Tremco.
  - d. Masterseal NP 2; Master Builders Solutions Div., BASF

- B. Uses: Interior use for exposed concrete or masonry wall control joints

2.5 SILICONE JOINT SEALANT

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100, for Use G, A, M, O; non-staining and field-tintable.

1. Basis of Design Product: Provide Pecora Corporation "890FTS" sealant or equal manufactured by one of the following:
  - a. Dow Corning Corporation.
  - b. GE Advanced Materials - Silicones
  - c. Sika Corporation, Construction Products Division
  - d. Tremco Incorporated

- B. Additional Movement Capability: 100 percent movement in extension and 50 percent in compression for a total of 150 percent movement.

- C. Uses: General exterior use.

2.6 POURABLE URETHANE JOINT SEALANT

- A. Multicomponent Pourable Urethane Sealant: Manufacturer's standard, non-modified, two-part, urethane sealant; complying with ASTM C 920, Type M, Grade P, Class 25, Uses T, M, A and, as applicable to joint substrates indicated, O.

1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
  - a. NR-200 Urexpan, Pecora Corporation
  - b. Sikaflex 2c SL, Sika Corporation
  - c. Masterseal SL 2; Master Builders Solutions Div., BASF

- B. Uses: Interior or exterior use for level pavement or slab joints.

2.7 NONSAG URETHANE JOINT SEALANT

- A. Multi-Part Non-Sag Urethane Sealant: Except as otherwise indicated, provide manufacturer's standard, non-modified, two-part, urethane sealant; complying with ASTM C 920, Type M, Grade NS, Class 25, Uses T, M, A and, as applicable to joint substrates indicated, O.

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1. Available Products: Subject to compliance with requirements, urethane joint sealants that may be incorporated in the Work include, but are not limited to, the following:
  - a. Sikaflex 2c NS; Sika Corp
  - b. Dynatred, Pecora Corporation
  - c. Masterseal NP 2; Master Builders Solutions Div., BASF
- B. Uses: Interior or exterior use for pavement or slab joints where slope exceeds one percent.

2.8 PREFORMED FOAM SEALANTS

- A. Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
  1. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
  2. Impregnating Agent: Chemically stabilized acrylic.
  3. Density: Manufacturer's standard.
  4. Backing: None.
  5. Available Products: Subject to compliance with requirements, preformed foam sealants that may be incorporated in the Work include, but are not limited to, the following:
    - a. "Emseal," Emseal Corp.
    - b. "Emseal Greyflex," Emseal Corp.
    - c. "Wil-Seal 150," Wil-Seal Construction Foams Div., Illbruck.
    - d. "Wil-Seal 250," Wil-Seal Construction Foams Div., Illbruck.

2.9 JOINT SEALANT BACKING

- A. General: 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.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
  1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
  2. Manufacturer: Provide Cera-Rod manufactured by W.R. Meadows, Inc., or equivalent.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.10 JOINT FILLERS FOR EXTERIOR CONCRETE SLABS



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- A. General: Provide joint fillers of thickness and depth indicated, or if not indicated 1/2" thick by depth of joint.
- B. Bituminous Fiber Joint Filler: Provide preformed strips of with asphalt binder encased between two layers of saturated felt or glass-fiber felt, complying with ASTM D 1751.
  - 1. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint and seal with sealant.

2.11 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.
- 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 in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form release agents from concrete.

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4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint fillers.
    - b. Do not stretch, twist, puncture, or tear joint fillers.
    - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
  2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
  1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
    - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

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JOINT SEALANTS

- F. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

## **Division 08**



SECTION 081113  
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following hollow-metal work:
  - 1. Steel doors
  - 2. Steel door frames.
- B. Related Requirements:
  - 1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.
  - 2. Section 088000 "Glazing" for glazing inserted in hollow metal doors and frames..

1.2 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, core descriptions, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door type.
  - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.
  - 6. Details of anchorages, joints, field splices, and connections.
  - 7. Details of accessories.
  - 8. Details of moldings, removable stops, and glazing.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

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HOLLOW METAL DOORS AND FRAMES

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- 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. Ceco Door Products; an Assa Abloy Group company.
  - 2. Curries Company; an Assa Abloy Group company.
  - 3. Republic Doors and Frames.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 DOORS AND FRAMES

- A. Construct doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
  - 1. Physical Performance: Level A according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm).
    - c. Door Faces:
      - 1) Exterior Doors: Metallic-coated steel sheet, minimum thickness of 16 gage, 0.053 inch (1.3 mm), with minimum A60 (ZF180) coating
      - 2) Interior Doors: Uncoated, cold-rolled steel sheet, minimum thickness of 16 gage 0.053 inch (1.3 mm).
    - d. Edge Construction: Model 2, Seamless (continuously welded seams, edge filled, dressed smooth).
    - e. Core: Polystyrene slab, bonded to inside of both face sheets.
    - f. Basis of Design Doors: Legion (LP) Series by Ceco Door, or equal.
  - 3. Frames:

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- a. Materials: Minimum thickness of 14 gage, 0.067 inch (1.7 mm), uncoated, steel sheet for interior doors and metallic coated to match exterior doors for exterior locations.
  - b. Construction: Full profile welded, thermal break frames.
  - c. Basis of Design Frames: Mercury Series by Ceco Doors, or equal.
4. Exposed Finish: Prime door and frames
  5. Thermal-Rated Doors and Frames: Provide door and frame assemblies fabricated with thermal-resistance value (R-value) of 2.33 or better when tested according to NFRC102-2014, ASTM C1199 and ASTM C 1363.

2.3 FRAME ANCHORS

A. Jamb Anchors:.

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.4 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.



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- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Sections 088000 "Glazing".
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
  - 1. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
  - 2. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
  - 3. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
  - 4. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
  - 4. Jamb Anchors: Provide number and spacing of anchors as follows:

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- a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
    - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
    - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
    - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
    - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
  - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
    - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
    - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
    - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
    - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
  - c. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
- 5. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
  - 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
- 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
- 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
  - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

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3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.6 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.7 ACCESSORIES

- A. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 as required by standards specified.

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1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - b. Install frames with removable stops located on secure side of opening.
    - c. Install door silencers in frames before grouting.
    - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
  2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
  4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
  5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
  6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  7. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    - c. At Bottom of Door: 3/4 inch (19.1 mm) plus or minus 1/32 inch (0.8 mm).
    - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

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3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 083326  
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of overhead coiling doors:
  - 1. Insulated service doors, motor operated.
- B. Related Sections include the following:
  - 1. Division 26 Sections for disconnect switches and circuit breakers for powered operators.

1.2 DEFINITIONS

- A. Operation Cycle: One complete cycle of a door begins with the door in the closed position. The door is then moved to the open position and back to the closed position.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and stresses without evidencing permanent deformation of door components.
  - 1. Exterior Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward and outward
- B. Operation-Cycle Requirements: Design overhead coiling door components and operator to operate for not less than 100,000 cycles.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:
  - 1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
  - 2. Summary of forces and loads on walls and jambs.
  - 3. Motors: Show nameplate data and ratings; characteristics; mounting arrangements; size and location of winding termination lugs, conduit entry, and grounding lug; and coatings.
- B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets.

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1. Wiring Diagrams: Detail wiring for power, signal, and control systems. Differentiate between manufacturer-installed and field-installed wiring and between components provided by door manufacturer and those provided by others.

- C. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available for units with factory-applied finishes

1.5 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the overhead coiling door manufacturer for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead coiling doors through one source from a single manufacturer.
  1. Obtain operators and controls from the overhead coiling door manufacturer.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, for the following period:
  1. Door Assemblies: Two years.
  2. Motors: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Products: Provide specified products of Cornell Iron Works Inc. or equal from one of the following manufacturers:
  1. The Cookson Company.
  2. Raynor Garage Doors
  3. Pacific Rolling Door Co.
  4. Overhead Door Corporation.
  5. Wayne-Dalton Corp.
  6. Windsor Door; A United Dominion Company.

2.2 DOOR CURTAIN MATERIALS AND CONSTRUCTION

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- A. Basis of Design Product: Thermiser Insulated Rolling Door Model ESD20 by Cornell in galvanized steel, or equal
- B. Door Curtain: Fabricate overhead coiling door curtain of interlocking slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of material thickness recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
  - 1. Galvanized Steel Door Curtain Slats: Double skin interlocking roll formed interior and exterior metal slats with foamed-in-place insulation between slats.
    - a. Profile: Manufacturer's standard flat-profile slats
    - b. Thickness: Minimum 24 gauge exterior faces, 24 gauge interior faces.
    - c. Insulation: 7/8" thick closed cell pressure foamed in place urethane insulation, Min R value of 8. Foam shall meet the following criteria:
      - 1) Flame Spread Index of 0
      - 2) Smoke Developed Index of 10 as tested per ASTM E84
      - 3) CFC-free process with an Ozone Depletion Potential rating of 0
      - 4) Meets foam plastic insulation requirements of the 2012 IBC®, section 2603.
- C. Service Door Windlocks and Endlocks: Malleable-iron castings galvanized after fabrication, secured to curtain slats with galvanized rivets, or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement
- D. Service Door Bottom Bar: Consisting of 2 angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick, either galvanized or stainless-steel extrusions to suit type of curtain slats.
- E. Service Door Curtain Jamb Guides: Fabricate curtain jamb guides of steel angles, or channels and angles, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Build up units with not less than 3/16-inch- (5-mm-) thick, galvanized steel sections complying with ASTM A 36 (ASTM A 36M), and ASTM A 123. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain and a continuous bar for holding windlocks.

2.3 HOODS AND ACCESSORIES

- A. Hood: Form to entirely enclose coiled curtain and operating mechanism at opening head. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.
- B. Weatherseals: Provide replaceable, adjustable, continuous, compressible weather-stripping gaskets fitted to bottom and top of doors, unless otherwise indicated. At door head, use 1/8-inch- (3-mm-) thick, replaceable, continuous sheet secured to inside of hood.
  - 1. In addition, provide replaceable, adjustable, continuous, flexible, 1/8-inch- (3-mm-) thick seals of flexible vinyl, rubber, or neoprene at door jambs for a weathertight installation.



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- C. Push/Pull Handles: For push-up-operated or emergency-operated doors, provide galvanized steel lifting handles on each side of door.
  - 1. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.
- D. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
  - 1. Locking Bars: Single-jamb side, operable from inside only.
  - 2. Provide lock cylinder to match cylinders and keying of building as specified in Division 08 Section "Door Hardware."

2.4 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of adjustable-tension steel helical torsion spring, mounted around a steel shaft and contained in a spring barrel connected to door curtain with required barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.
- C. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.
- D. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast-iron or cold-rolled steel plate with bell-mouth guide groove for curtain.

2.5 MOTOR DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
  - 1. Comply with NFPA 70.
  - 2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24 V, ac or dc.
  - 3. Cycle Requirements: Maximum 20 times per day.
- B. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging chain and sprocket operator and releasing brake for emergency manual operation while

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disconnecting motor without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

- C. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.
- D. Motor-Operator Type: Provide wall-, hood-, or bracket-mounted, jackshaft-type door operator unit consisting of electric motor, enclosed lubricated gear drive, and chain and sprocket secondary drive.
  - 1. Basis of Design product: MGH motor operator by Cornell, or equal.
- E. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motors complying with NEMA MG 1; with overload protection; sized to start, accelerate, and operate door in either direction from any position, at not less than 6 in/sec (15 cm/s) and not more than 9 in/sec (23 cm/s), without exceeding nameplate ratings or service factor.
  - 1. Electrical Characteristics: 120V, 1 phase, 60Hz. Coordinate wiring requirements and electrical characteristics of motors with building electrical system.
  - 2. Provide 1/3 HP unit.
- F. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- G. Remote-Control Station: Provide momentary-contact, three-button control station with push-button controls labeled "Open," "Close," and "Stop."
  - 1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
  - 2. Exterior units, in NEMA 4X enclosure, MMTC 3B4X, flush mounted.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation by use of disconnect cable for auxiliary push-up operation.
- I. Obstruction Detection Device: Provide each motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of sensor immediately stops and reverses downward door travel.
  - 1. Sensor Edge: Provide each motorized door with an automatic safety sensor edge, located within astragal mounted to bottom bar. Contact with sensor immediately stops and reverses downward door travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
    - a. Provide electrically actuated automatic bottom bar.

2.6 FINISHES, GENERAL

SECTION 083326  
OVERHEAD COILING DOORS

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast..

2.7 STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
  - 1. Color: As selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 ADJUSTING

- A. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

3.4 DEMONSTRATION

SECTION 083326  
OVERHEAD COILING DOORS

- A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train Owner's maintenance personnel as specified below:
1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
    - a. Test door closing when activated by detector or alarm connected fire-release system. Reset door-closing mechanism after successful test.
  2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and procedures for testing and resetting release devices.
  3. Schedule training with Owner with at least 7 days' advance notice.

END OF SECTION 083326

SECTION 083326  
OVERHEAD COILING DOORS

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SECTION 085113  
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes aluminum windows of the performance class and grade indicated. Window types required include the following:
  - 1. Project-out, awning.
  - 2. Fixed.
- B. Auxiliary products specified in this Section include:
  - 1. Louvered panels installed as part of window system.
  - 2. Fixed spandrel panels installed as part of window system.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 08 Section "Glazing."

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies representing types, grades, classes, and sizes required for Project according to test methods indicated.
- B. Test Criteria: Testing shall be performed by a qualified independent testing agency based on the following criteria:
  - 1. Wind Loads: Provide aluminum windows capable of withstanding wind-load design pressures indicated on the Drawings.
  - 2. Test Procedures: Test window units according to ASTM E 283 for air infiltration, ASTM E 331 for water penetration, and ASTM E 330 for uniform load deflection and structural performance.
- C. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
  - 1. Performance Class and Grade: As indicated in the window type in Part - 2 below.
- D. Performance Requirements: Testing shall demonstrate compliance with requirements indicated in AAMA/WDMA/CSA 101/I.S.2/A440 - 08 for air infiltration, water penetration, and structural performance for type, grade, and performance class of window units required.

SECTION 085113  
ALUMINUM WINDOWS

1. Air-Infiltration Rate: Not more than quantity of cfm/ft. (cu. m/h per m) of operable sash joint for an inward test pressure of as indicated in lbf/sq. ft. (Pa) for the window type in Part - 2 below.
2. Water Penetration: No water penetration as defined in the test method at an inward test pressure indicated in the window type in Part - 2 below.
3. Uniform Load Deflection: No deflection in excess of 1/175 of any member's span during the imposed load, for a positive (inward) and negative (outward) test pressure indicated in lbf/sq. ft. (Pa) for the window type in Part - 2 below.
4. Structural Performance: No failure or permanent deflection in excess of 0.4 percent of any member's span after removing the imposed load, for a positive (inward) and negative (outward) test pressure indicated in lbf/sq. ft. (Pa) for the window type in Part - 2 below.
5. Condensation Resistance: Where window units are indicated to be "thermally improved," provide units tested for thermal performance according to AAMA 1503.1 showing a minimum condensation resistance factor (CRF) as indicated for the window type in Part - 2 below.
6. Thermal Transmittance: Provide window units with a U-value maximum as indicated in Btu/sq. ft. x h x deg F (W/sq. m x K) at 15-mi./h (24-km/h) exterior wind velocity, when tested according to AAMA 1503.1, for the window type in Part - 2 below.
7. Forced-Entry Resistance: Comply with performance grade 10 requirements when tested according to ASTM F 588.
8. Thermal Movements: Provide window units that allow thermal movement resulting from the following maximum change (range) in ambient temperature when engineering, fabricating, and installing aluminum windows to prevent buckling, opening of joints, and overstressing of components, connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime sky heat loss.
  - a. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.3 ACTION SUBMITTALS

- A. Product Data for each type of window, spandrel panel and louvered panel required, including the following:
  1. Construction details and fabrication methods.
  2. Profiles and dimensions of individual components.
  3. Data on hardware, accessories, and finishes.
  4. Recommendations for maintaining and cleaning exterior surfaces.
- B. Shop Drawings showing fabrication and installation of each type of window, spandrel panel and louvered panel required including information not fully detailed in manufacturer's standard Product Data and the following:
  1. Layout and installation details, including anchors.
  2. Elevations at 1/4 inch = 1 foot (1:50) scale and typical window unit elevations at 3/4 inch = 1 foot (1:20) scale.
  3. Full-size section details of typical composite members, including reinforcement and stiffeners.
  4. Location of weep holes.

SECTION 085113  
ALUMINUM WINDOWS

5. Panning details.
6. Hardware, including operators.
7. Window cleaning provisions.
8. Glazing details.
9. Accessories.

- C. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
- E. Samples for Verification: 12-inch- (300-mm-) long sections of window members with applied finish. The Architect reserves the right to require additional samples that show fabrication techniques, workmanship, and design of hardware and accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Test reports from a qualified independent testing agency indicating that each type, grade, and size of window unit complies with performance requirements indicated based on comprehensive testing of current window units within the last 5 years. Test results based on use of down-sized test units will not be accepted.
- B. Qualification Data:
  1. For Installer to demonstrate their capabilities and experience. Provide evidence of acceptability from manufacturer for installation.
  2. For manufacturer.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer acceptable to aluminum window manufacturer for installation of units required for this Project, who has completed installation of aluminum windows similar in material, design, and extent to those required for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.
- C. Source Limitations: Obtain all aluminum windows, louvered panels and spandrel panels through one source and from a single manufacturer.
- D. Product Options: The Drawings indicate sizes, profiles, dimensional requirements, and aesthetic effects of aluminum windows and are based on the specific window types and models indicated. Other aluminum window manufacturers whose products have equal performance characteristics may be considered provided deviations in size, profile, and dimensions are minor and do not alter the aesthetic effect. Refer to Division 01 Section regarding substitutions.

1.6 PROJECT CONDITIONS



SECTION 085113  
ALUMINUM WINDOWS

- A. Field Measurements: Check window openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty signed by aluminum window manufacturer agreeing to repair or replace window components that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
  - 2. Faulty operation of sash and hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: 5 years after date of Substantial Completion.
- D. Warranty Period for Glass: 10 years after date of Substantial Completion.
- E. Warranty Period for Metal Finishes: 20 years after date of Substantial Completion for Kynar painted finish and 10 years for anodized finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: The drawings are based on windows by Wojan Window and Door Corporation. Provide specified products or equivalent products by one of the following:
  - 1. EFCO Corporation
  - 2. Kawneer, an Arconic Company.
  - 3. YKK

2.2 MATERIALS

- A. Aluminum Extrusions: Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength and not less than 0.080 inch thick at any location for main frame and sash members.

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- B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.
  - 1. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125 inch (3.2 mm) thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.
  - 2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate. Where exposed fasteners are unavoidable, provide tamper-resistant fasteners.
- C. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with requirements of ASTM B 633; provide sufficient strength to withstand design pressure indicated.
- D. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action and for complete concealment when aluminum window is closed.
  - 1. Weather-Stripping Material: Manufacturer's standard system and materials.
- E. Sealant: For sealants required within fabricated window units, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating. Comply with Division 07 Section "Joint Sealants" of these Specifications for installation of sealants.

2.3 GLAZING

- A. Provide insulating glass unit of material and thickness as specified in Section 088000.

2.4 HARDWARE

- A. General: Where not indicated, provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum and of sufficient strength to perform the function for which it is intended.

2.5 ACCESSORIES

- A. General: Provide manufacturer's standard accessories that comply with indicated standards.
- B. Insect Screens: Provide insect screens for each operable exterior sash or ventilator as scheduled. Locate screens on inside or outside of window sash or ventilator, depending on window type. Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Provide wickets where indicated.
  - 1. Screen Frames: Fabricate frames of tubular-shaped, extruded- or formed-aluminum members of 0.040-inch- (1-mm-) minimum wall thickness, with mitered or coped joints and concealed mechanical fasteners. Finish frames to match window units.

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ALUMINUM WINDOWS

- a. Provide removable PVC spline-anchor concealing edge of screen frame.
  - 2. Wire-Fabric: 18-by-16 mesh of 0.011-inch-diameter, coated aluminum wire.
    - a. Color: As selected by Architect.
  - C. Sills: Finished to match window. Provide where indicated.
    - 1. Extruded: .125 inch thick extruded aluminum.
  - D. Louvered Panels: Manufacturer's standard, in finish to match windows.
  - E. Spandrel Panels: Manufacturer's standard metal faced spandrel panels, in finish to match windows.
  - F. Provide integral mulling/stacking system as required.
  - G. Provide receptors, subsills, panning, anchors and all accessories required for a complete installation.
- 2.6 FABRICATION, GENERAL
- A. General: Fabricate aluminum window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.
    - 1. Provide units that are reglazable without dismantling sash or ventilator framing.
  - B. Thermally Improved Construction: Fabricate window units with an integral, concealed, low-conductance, structural thermal barrier, located between exterior materials and window members exposed on interior, in a manner that eliminates direct metal-to-metal contact.
    - 1. Provide thermal-break construction of pour and debridge polyurethane utilizing "Azo-Brader" technology, or equal.
    - 2. Provide hardware with low conductivity or nonmetallic material for hardware bridging thermal breaks at frame or vent sash.
  - C. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
  - D. Preglazed Fabrication: Preglaze window units at the factory. Comply with glass and glazing requirements of Division 08 Section "Glazing" of these Specifications and AAMA 101.
  - E. Fabrication:
    - 1. Frame: 0.080 inch thick extrusions with each corner joined with mechanical fasteners.
    - 2. Vent: 0.080 inch thick tubular members with each corner mitered, gusset reinforced, crimped and sealed.
    - 3. Provide units incorporating pressure equalization to direct water to the exterior through baffled weep holes and/or compression seals installed in the aluminum extrusion.
    - 4. Glazing Stops: Provide snap-on glazing stops, coordinated with glass selection and glazing system indicated. Finish to match window units.

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- F. Weatherstripping: Provide sliding-type weatherstripping where sash rails slide horizontally or vertically along unit frame. Provide compression-type weatherstripping at perimeter of each operating sash where sliding type is inappropriate.

1. Provide weatherstripping locked into extruded grooves in sash.

- G. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

2.7 FIXED WINDOWS

- A. Window Performance Class and Grade: Comply with requirements of AAMA Performance Class and Grade AW-PG40-FW. Window units shall successfully pass life-cycle test requirements specified in AAMA 910.
- B. Performance Requirements:

PERFORMANCE REQUIREMENTS							
Window Type(s)	Window Grade and Class	Air-Infil. Rate/ @ test pressure	Water Penetr.	Uniform Load Deflect.	Uniform Load Struct.		
Fixed	AW-PG40	.01 cfm/ ft. of sash @ 6.27	8.15 psf	40 psf	60 psf		

- C. Frame Depth: 2-3/8"

- D. Basis of Design Product: 4500 Series Fixed Windows by Wojan, or equal.

- E. Finish: Clear anodized.

2.8 PROJECTED WINDOWS (AWNING)

- A. Window Performance Class and Grade: Comply with requirements of AAMA Performance Class and Grade AW-PG40-AP. Window units shall successfully pass life-cycle test requirements specified in AAMA 910.

- B. Hardware: Provide the following equipment and operating hardware:

1. Hinges: 4-bar arm, stainless steel.
2. Locks: Cast white bronze lift handles, two per sash located one at each jamb.
3. Pull Handle: Cast white bronze, one at each sash.

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C. Screens: Provide insect screens with wickets.

D. Performance Requirements:

PERFORMANCE REQUIREMENTS							
Window Type(s)	Window Grade and Class	Air-Infil. Rate/ @ test pressure	Water Penetr.	Uniform Load Deflect.	Uniform Load Struct.		
Awning	AW-PG40	.03 cfm/ ft. of sash @ 6.27	8.15 psf	40 psf	60 psf		

E. Frame Depth: 2-3/8"

F. Basis of Design Product: 4600 Series Fixed Windows by Wojan, or equal.

G. Finish: Clear anodized.

## 2.9 FINISHES

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- C. Class I, Clear Anodic Finish: AA-M12C22A41, Class I, 0.018 mm or thicker complying with AAMA 611.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Inspect openings before installation. Verify that rough or masonry opening is correct and sill plate is level.
  - 1. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.
  - 2. Metal surfaces shall be dry; clean; free of grease, oil, dirt, rust and corrosion, and welding slag; without sharp edges or offsets at joints.

### 3.2 INSTALLATION

SECTION 085113  
ALUMINUM WINDOWS

- A. Comply with manufacturer's specifications and recommendations for installing window units, hardware, operators, spandrel panels, louvered panels and other components of the Work.
- B. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
  - 1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified under "Dissimilar Materials" Paragraph in appendix to AAMA 101.
- C. Set sill members and other members in a bed of sealant or with joint fillers or gaskets, as shown on Shop Drawings, to provide weathertight construction. Refer to Division 07 Section "Joint Sealants" for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the Work.
  - 1. Sealants, joint fillers, and gaskets to be installed after installation of window units are specified in another Division 07 Section.

3.3 CLEANING

- A. Clean aluminum surfaces promptly after installing windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.
- B. Clean glass of preglazed units promptly after installing windows. Comply with requirements of Division 08 Section "Glazing" for cleaning and maintenance.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to aluminum window manufacturer, that ensure window units are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 085113

SECTION 085113  
ALUMINUM WINDOWS

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SECTION 087100  
DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Commercial door hardware for the following:
    - a. Swinging doors
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 08 Section "Hollow Metal Doors and Frames" for factory prefabricating and factory premachining of doors for door hardware.

1.2 SUBMITTALS

- A. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- B. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size, and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
    - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for hardware.
    - g. Door and frame sizes and materials.
    - h. Keying information.
  - 2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
  - 3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.



SECTION 087100  
DOOR HARDWARE

- D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced Door and hardware Institute, Architectural Hardware Consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation and who shall review the schedule for overall coordination of hardware.
  - 1. Require supplier to meet with Owner to finalize functions of locking devices, keying requirements and to obtain final instructions in writing.
  - 2. Hardware schedule shall be prepared and sealed by AHC.
- C. Regulatory Requirements: Comply with provisions of the following:
  - 1. Comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1-09 , as follows:
    - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      - 1) Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
      - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    - c. Thresholds: Not more than ½ inch (13 mm high). Bevel raised thresholds with a slope of not more than 1:2.
  - 2. NFPA 101: Comply with the following for means of egress doors:
    - a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    - b. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
    - c. Thresholds: Not more than 1/2 inch (13 mm) high.
- D. Function and Keying Conference: Conduct conference at Project site to comply with requirements in Division 1. Incorporate function and keying conference decisions into final hardware and keying schedule after reviewing door hardware functions and keying system including, but not limited to, the following:

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DOOR HARDWARE

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Address for delivery of keys.

1.4 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.5 PROJECT CONDITIONS

- A. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Upon request, check the Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.
- C. Coordinate hardware requirements with card readers provided by Owner.

1.6 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

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1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: From date of Substantial Completion, unless otherwise indicated.:

1. Locksets: Three (3) years
2. All other Hardware: Two (2) years.

1.7 MAINTENANCE AND TRAINING

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide products and manufacturers as listed in "Schedule of Acceptable Manufacturers and Products" included at end of this section.

2.2 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products are identified by using hardware designation numbers of the following:

1. Manufacturer's Product Designations: The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated, or equivalent product approved by the Architect.

2.3 MATERIALS AND FABRICATION

- A. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- B. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
- C. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use

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thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

2.4 HINGES, BUTTS

- A. Templates: Provide only template-produced units for hinges at new frames. Provide units to match existing frame mortises where frame is being re-used.
- B. Screws: Provide Phillips flat-head screws complying with the following requirements:
  - 1. For metal doors and frames install machine screws into drilled and tapped holes.
  - 2. Finish screw heads to match surface of hinges.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Out-Swing Exterior Doors: Nonremovable pins.
  - 2. Out-Swing Corridor Doors: Nonremovable pins.
  - 3. Interior Doors: Nonrising pins.
  - 4. Tips: Flat button and matching plug, finished to match leaves.

2.5 LOCK CYLINDERS, CORES AND KEYING

- A. Equip locks with Corbin Russwin cylinders for interchangeable-core 6-pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.
  - 1. Furnish final cores and keys for installation by Owner.
- B. Metals: Construct lock cylinder and core parts from brass or bronze, stainless steel, or nickel silver.
- C. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
  - 1. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE."
  - 2. Design master key system allowing for 300 percent expansion.
- D. Key Material: Provide keys of nickel silver only.
- E. Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, and 5 grandmaster keys for each grandmaster system.
  - 1. Deliver keys to Owner.

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2.6 LOCKS, LATCHES AND BOLTS

- A. Locksets and Latchsets: Extra-heavy-duty lever bored lockset with interchangeable core and solid shank with no opening for access to keyed lever keeper, through-bolted lock chassis (outside of the lock chassis prep) to prevent rotation of chassis after installation.
- B. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.
  - 1. Provide flat lip strikes for locks with 3-piece, antifriction latchbolts as recommended by manufacturer.
  - 2. Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.
  - 3. Provide dust-proof strikes for foot bolts, except where special threshold construction provides nonrecessed strike for bolt.
  - 4. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
- C. Lock Throw: Provide 5/8-inch minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
  - 1. Provide 1/2-inch minimum throw of latch for other bored and preassembled types of locks and 3/4-inch minimum throw of latch for mortise locks. Provide 1-inch minimum throw for all dead bolts.
- D. Flush or Surface Bolt Heads: Minimum of 1/2-inch-diameter rods of brass, bronze, or stainless steel with minimum 12-inch-long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

2.7 DOOR TRIM UNITS

- A. Fabricate protection plates the width of single leaf doors less 1-1/2-inches, and width of door leaf less 1" for pairs of doors, to yield a uniform reveal. Provide on push side by height indicated.
  - 1. Metal Plates: Stainless steel , 0.050 inch (U.S. 18 gage).

2.8 WEATHERSTRIPPING AND SEALS

- A. General: Provide continuous weatherstripping on exterior doors and interior doors where indicated or scheduled. Provide noncorrosive fasteners.
- B. Weatherstripping at Jambs and Heads: Provide brush type insert and extruded aluminum with anodized finish retainer strips, surface applied, of design and size scheduled.
- C. Weatherstripping Sweep: Provide sweep consisting of brush type insert and extruded aluminum with anodized finish housing, surface applied, of design and size scheduled.

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DOOR HARDWARE

2.9 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.

2.10 HARDWARE FINISHES

- A. Provide satin chrome, BHMA 626 (US26D) finish for all hardware items to greatest extent possible or manufacturer's standard finish matching this finish.
  - 1. Provide other finishes as specifically scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame supports, and other conditions affecting performance of door hardware.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
  - 1. All doors with lever trim shall have hardware mounted at heights required by ADA (Americans with Disabilities Act) regulations.
  - 2. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 09 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Pre-drill and countersink doors, frames and units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Hand tighten screws and fasteners, use of power driven tools must be limited to preliminary driving screws if permitted by door and hardware manufacturer.

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- F. Replace doors damaged by improper hardware installation.
- G. Set thresholds for exterior doors in full bed of sealant specified in Division 07 Section "Joint Sealant."
- H. Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.3 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
  - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

3.4 HARDWARE SCHEDULE

- A. **SCHEDULE OF ACCEPTABLE MANUFACTURERS AND PRODUCTS:** Manufacturers and products are listed in Hardware Sets to establish the general product appearance, type and quality intended for use. Certain items have been specially selected for their appearance and function. Equal products of manufacturers other than those listed below may be acceptable subject to the approval of the Architect. Substitutions proposed for hardware items must be equivalent in every way, as judged solely by Architect.
  - 1. Hinges Interior Doors: Hager BB 1279, full mortise standard weight, BHMA 652 (US26D) finish; 4-1/2" x 4-1/2", 2-ball bearing 5-knuckle; or equivalent by Bommer, McKinney, or Stanley.
  - 2. Hinges Exterior Doors: Hager BB 1199 (heavy weight), Stainless steel with stainless steel pin, BHMA 630 (US32D) finish; 4-1/2" x 4-1/2", 4-ball bearing 5-knuckle; or approved equivalent by Bommer or McKinney.
  - 3. Locksets/Latchsets: Best cylindrical bored lockset, Series 9K, with #15D lever and rose style, with interchangeable/ removable core.

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DOOR HARDWARE

4. Interchangeable Cores: Corbin Russwin, type as selected by Owner, for insertion in locksets, exit devices, and elsewhere as scheduled; finish to match lockset. Provide with key and concealed cylinder stamping.
5. Cylinders for use with Interchangeable Core: Corbin Russwin 6 or 7 pin as selected by Owner, with temporary construction cores, finish to match lockset.
6. Kickplates: Rockwood, B4E, stainless steel 8 inches high unless noted otherwise, by door width, where indicated, or equivalent by Ives.
7. Silencers: Rockwood No. 608, for hollow metal frames, No. 609 for wood frames, or equivalent by Ives.
8. Wall Stops: Rockwood No. 406, 407 or 408 as required by wall material, with grey bumper and BHMA 630 finish; or equivalent by Ives
9. Floor Stops: Rockwood No.441 or 443 as required, provide risers 449 as required, with grey bumper and BHMA 630 finish; or equivalent by Ives.
10. Overhead Stops: Rockwood OH 1000 Series stainless steel, of size required, or equivalent by Ives.
11. Surface Bolts: Rockwood 580-12, 12" surface bolt or equal by Trimco or Ives.
12. Thresholds for Exterior Doors: Pemko Aluminum type as indicated on Drawings for each location; 176A finish (mill), or approved equivalent by National Guard Products or Zero, length as required, width as shown on details
13. Weatherstripping: Pemko Aluminum type as indicated on Drawings for each location; 176A finish (mill), or approved equivalent by National Guard Products or Zero.
14. Sweep: Pemko Aluminum type as indicated on Drawings for each location; 176A finish (mill), or approved equivalent by National Guard Products or Zero.
15. Rain Drip: National Guard Products: 17, or approved equivalent by Pemko or Zero.

**B. SCHEDULED HARDWARE SETS**

**GENERAL NOTES:**

1. Doors hardware shall not prohibit exiting from spaces.
2. Provide hardware finishes specified above unless noted otherwise for a specific set or door.
3. Provide all required installation accessories and options necessary for complete installation of each hardware component, to ensure proper operation of the product.
4. Coordinate all hardware components for each door leaf for overall compatibility.
5. Through-bolting of hardware is not permitted, coordinate all blocking requirements with door manufacturer.
6. Provide all interior doors with wall stops, one per leaf; provide floor type as required when wall stop not feasible. Specific stops scheduled are exceptions to this.



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DOOR HARDWARE

END OF SECTION 087100

SECTION 088000  
GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Windows.
  - 2. Doors.

1.2 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- D. Deterioration of Laminated Glass: Defects developed from normal use that are 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.
- E. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- C. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
  1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
  1. Insulating glass.
  2. Coated float glass.
  3. Glazing sealants.
- G. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of glass from one primary-glass manufacturer.
- C. Source Limitations for Glass Sputter-Coated with Solar-Control Low-E Coatings: Where solar-control low-e coatings of a primary glass manufacturer that has established a certified fabricator program is specified, obtain sputter-coated solar-control low-e-coated glass in fabricated units from a manufacturer that is certified by coated-glass manufacturer
- D. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
  1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

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- E. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
  - 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- F. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
  - 1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
  - 2. Safety glass includes laminated glass.
- G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."
  - 2. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
  - 3. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- H. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
  - 1. Insulating Glass Certification Council.
  - 2. Associated Laboratories, Inc.
  - 3. National Accreditation and Management Institute.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F (4.4 deg C).

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GLAZING

1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- D. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
  - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRIMARY FLOAT GLASS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); Class 1 unless otherwise indicated in schedules at the end of Part 3.

2.2 COATED FLOAT GLASS

- A. General: Provide coated glass complying with requirements indicated in this Article and in schedules at the end of Part 3.
- B. Sputter-Coated Float Glass: ASTM C 1376, float glass with metallic-oxide or -nitride coating deposited by vacuum deposition process after manufacture and heat treatment (if any), and complying with other requirements specified in schedules at the end of Part 3.
  - 1. Basis of Design Product: Solarban 60 by Vitro Architectural Glass (formerly PPG), or equal.

2.3 LAMINATED GLASS

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- A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in the Laminated-Glass Schedule at the end of Part 3.
- B. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
  - 1. Interlayer Material: Polyvinyl butyral sheets
  - 2. Interlayer Thickness: .030".
  - 3. Interlayer Color: Clear.
- C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:
  - 1. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.

2.4 INSULATING GLASS

- A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
- B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
- C. Sealing System: Dual seal, with primary and secondary sealants as follows:
  - 1. Manufacturer's standard sealants.
- D. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
  - 1. Aluminum with mill or clear-anodized finish.
  - 2. Desiccant: Molecular sieve or silica gel, or blend of both.
  - 3. Corner Construction: Manufacturer's standard corner construction.

2.5 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
  - 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.

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4. Field-applied sealants shall have a VOC content of not more than 250 g/L.
- B. Single-Component Neutral-Curing Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 50; Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.
  1. Products:
    - a. Dow Corning Corporation; 791.
    - b. Dow Corning Corporation; 795.
    - c. GE Silicones; SilPruf NB SCS9000.
    - d. GE Silicones; UltraPruf II SCS2900.
    - e. Pecora Corporation; 865.
    - f. Pecora Corporation; 895.
    - g. Pecora Corporation; 898

2.6 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
- B. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
  1. Type 1, for glazing applications in which tape acts as the primary sealant.
  2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 GLAZING GASKETS

- A. Glazing gaskets for aluminum windows are specified in Division 08 Section "Aluminum Windows."

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Silicone elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

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- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. 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.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. 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.



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- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. 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.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) 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 (3-mm) 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.
- H. 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.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. 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.
- K. 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.

3.4 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.

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- F. Apply heel bead of elastomeric sealant.
- 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.

3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets 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.

3.6 SEALANT GLAZING (WET)

- 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.

3.7 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

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- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.8 GLASS SCHEDULE

A. Exterior Glazing:

- 1. Exterior Doors: Provide 1 inch insulated laminated glass as follows:
  - a. Outboard Lite: 1/4-inch thick clear, laminated glass, low-E coated on the second surface.
    - 1) Low-Emissivity Sputter Coating: Solarban 60 by Vitro Architectural Glass (formerly PPG Industries, Inc.) or equal.
  - b. Air Space: 1/2 inch.
  - c. Inboard Lite: 1/4-inch thick clear, laminated glass.
  - d. Performance Characteristics:
    - 1) Visible Light Transmittance: Min 70%.
    - 2) Winter Nighttime U-Value: Max. 0.29
    - 3) Solar Heat Gain Coefficient (SHGC): Max. 0.39
    - 4) Light to Solar Gain (LSG): Max. 1.79.
    - 5) Exterior Visible Light Reflectance: 11%
    - 6) Interior Visible Light Reflectance: 12%
- 2. Aluminum Windows: Provide 1 inch insulated laminated glass for all windows where the bottom edge of the glazing is less than 18 inches from the floor, as follows:
  - a. Outboard Lite: 1/4-inch thick clear, laminated glass, low-E coated on the second surface.
    - 1) Low-Emissivity Sputter Coating: Solarban 60 by Vitro Architectural Glass (formerly PPG Industries, Inc.) or equal.
  - b. Air Space: 1/2 inch.
  - c. Inboard Lite: 1/4-inch thick clear, laminated glass.
  - d. Performance Characteristics:
    - 1) Visible Light Transmittance: Min 70%.
    - 2) Winter Nighttime U-Value: Max. 0.29
    - 3) Solar Heat Gain Coefficient (SHGC): Max. 0.39
    - 4) Light to Solar Gain (LSG): Max. 1.79.
    - 5) Exterior Visible Light Reflectance: 11%
    - 6) Interior Visible Light Reflectance: 12%

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GLAZING

3. Aluminum Windows: Provide 1 inch insulated glass for all other windows, as follows:
  - a. Outboard Lite: 1/4-inch thick clear, annealed glass, low-E coated on the second surface.
    - 1) Low-Emissivity Sputter Coating: Solarban 60 by Vitro Architectural Glass (formerly PPG Industries, Inc.) or equal.
  - b. Air Space: 1/2 inch.
  - c. Inboard Lite: 1/4-inch thick clear, annealed glass.
  - d. Performance Characteristics:
    - 1) Visible Light Transmittance: Min 70%.
    - 2) Winter Nighttime U-Value: Max. 0.29
    - 3) Solar Heat Gain Coefficient (SHGC): Max. 0.39
    - 4) Light to Solar Gain (LSG): Max. 1.79.
    - 5) Exterior Visible Light Reflectance: 11%
    - 6) Interior Visible Light Reflectance: 12%

B. Interior Glazing, as Scheduled:

1. Non-Fire Rated Doors: 1/4 inch clear laminated glass.

END OF SECTION 088000

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GLAZING

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## **Division 09**



SECTION 099000  
CONSTRUCTION AND RESTORATION PAINTING

PART 1 GENERAL

1.01 DEFINITIONS

- A. The word “paint” in this Section refers to substrate cleaners, fillers, sealers, primers, undercoats, enamels and other first, intermediate, last or finish coatings.
- B. The word “primer” in this Section refers to substrate cleaners, fillers, sealers, undercoats, and other first or intermediate coats beneath the last or finish coating.
- C. The words “finish paint” in this Section refer to the last or final coat and previous coats of the same material or product directly beneath the last or final coat.
- D. Finish Paint Systems: Finish paint and primers applied over the same substrate shall be considered a paint system of products manufactured or recommended by the finish coat manufacturer.
  - 1. Finish paint products shall meet or exceed specified minimum physical properties.
- E. Without limiting the general aspects of other requirements of these specifications, all surface preparation, coating and painting of interior and exterior surfaces shall conform to the applicable requirements of the Steel Structures Painting Council, ASTM, current Local and Federal Health Standards, and the coating/paint manufacturer's printed instructions.

1.02 SUBMITTALS

- A. Painting Schedule: **Contractor shall submit a** cross-referenced Painting Schedule listing all exterior and interior substrates to be painted and specified finish paint type designation; product name and manufacturer, recommended primers and product numbers, and finish paint color designation for each substrate to be painted.
  - 1. Designate exterior substrates by building name and number, substrate to be painted and surface location.
  - 2. Designate interior substrates by building name and number, floor, room name and number, and surface to be painted.
- B. Product Data Sheets: Manufacturer's published product data sheets describing the following for each finish paint product to be applied:
  - 1. Percent solids by weight and volume, solvent, vehicle, weight per gallon, ASTM D 523 gloss/reflectance angle, recommended wet and dry film thickness, volatile organic compound (VOC) content in lbs/gallon, product use limitations and environmental restrictions, substrate surface preparation methods, directions and precautions for mixing and thinning, recommended application methods, square foot area coverage per gallon, storage instructions, and shelf-life expiration date.
  - 2. Manufacturer's recommended primer for each finish paint product and substrate to be painted.



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3. Manufacturer's complete range of available colors for each finish paint product to be applied.
- C. Finish Paint Type Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.
  1. Samples shall be in the designated color and specified ASTM D 523 reflectance.
  2. Label each sample with the following information:
    - a. Project number and Painting Schedule designation describing substrates and locations represented by the sample.
    - b. Finish paint and primer manufacturer, product names and numbers, finish paint color and reflectance.
  3. Leave a 1 inch wide exposed strip of unpainted substrate and each coat of primer and finish paint.
  4. Sample Sizes:
    - a. Sheet Metals: 4 inch by 8 inch flat sheets.
    - b. Bar and Tubular Metals: 8 inch long bars or tubular stock.
  5. Steel Primer and Finish Coat Samples
    1. Self-Primer: 1 quart, each type specified.
    2. Finish Coat: 1 quart, each type specified
- D. Quality Control Submittals:
  1. Test Reports: Furnish certified test results from an independent testing laboratory, showing that products submitted comply with the specifications, when requested by the Director's Representative
  2. Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.

1.03 QUALITY ASSURANCE

- A. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.
  1. Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.
- B. Provide materials for each system type from a single manufacturer.
- C. Container Labels: Label each product container with paint manufacturer's name, product name and number, color name and number, thinning and application instructions, date of manufacture, shelf-life expiration date, required surface preparations, recommended coverage per gallon, wet and dry film thickness, drying time, and clean up procedures.
- D. Field Examples:
  1. Field examples to be applied on actual substrates to be painted and shall duplicate earlier approved paint samples.

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- a. Interior paint examples shall be applied in rooms with the same product intended for use.
  - b. Field Example Minimum Wet and Dry Film Thickness: As indicated on approved product data sheet.
  - c. Application: Apply each coat in a smooth uniform wet mil thickness without brush marks, laps, holidays, runs, stains, cloudiness, discolorations and other surface imperfections.
    - 1) Leave a specified exposed width of each previous coat beneath each subsequent coat of finish paint and primer.
  - d. Use of Field Examples: Field examples shall serve as a quality control standard for acceptance or rejection of painting Work to be done under this Section.
2. Field Example Sizes:
- a. Floor, Ceiling and Wall Examples: 100 square feet with 1 foot wide strips
  - b. Door and Frame Example: One door and Frame with 12" wide strips
  - c. Linear Substrate Examples: 20 lineal feet with 12 inch long strips.
3. Do not begin applying paints represented by field examples until examples have been reviewed and approved by the Engineer.
- a. Protect and maintain approved field examples until all painting work represented by the example has been completed and approved.
- D. Compatibility of Paint Materials: Primers and intermediate paints shall be products manufactured or recommended by the finish paint manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to the Site in original, unopened containers and cartons bearing manufacturer's printed labels. Do not deliver products which have exceeded their shelf life, are in open or damaged containers or cartons, or are not properly labeled as specified. Materials exceeding storage life recommended by the manufacturer shall be rejected.
- B. Storage and Handling: Store products in a dry, well ventilated area in accordance with manufacturer's published product data sheets. Storage location shall have an ambient air temperature between 45 degrees F and 90 degrees F.

1.05 PROJECT CONDITIONS

- A. Environmental Requirements:
  - 1. Ambient Air Temperature, Relative Humidity, Ventilation, and Surface Temperature: Comply with paint manufacturer's published product data sheet or other printed product instructions.
  - 2. If paint manufacturer does not provide environmental requirements, use the following:
    - a. Ambient Air Temperature: Between 45 degrees F and 75 degrees F.

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- b. Relative Humidity: Below 75 percent.
  - c. Ventilation: Maintain the painting environment free from fumes and odors throughout the Work of this Section.
  - d. Surface Temperature: At least 5 degrees F above the surface dew point temperature.
- 3. Maintain environmental requirements throughout the drying period.
- B. The following items are not to be field painted unless otherwise specified, noted or directed:
  - 1. Stainless steel, chrome plated surfaces, brass copper or aluminum.
  - 2. Piping or ductwork to be insulated.
  - 3. Steel to be cast in concrete
  - 4. Uninsulated mechanical equipment with factory applied finish.
  - 5. Unexposed galvanized items
  - 6. Top flanges of structural beams and girders in composite concrete-steel construction
- C. In locations where flammable vapors may be present, take positive action to prevent ignition by eliminating and controlling sources of ignition.
  - 1. Sources of ignition may include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical and mechanical), spontaneous ignition, chemical and physical-chemical reactions, and radiant heat.
- D. Provide mechanical ventilation adequate to remove flammable vapors to a safe location and to confine and control combustible residues so that life or property is not endangered.
  - 1. Equipment used to control hazardous exposure shall be explosion-proof.
  - 2. Keep mechanical ventilation in operation at all times while coating or painting operations are being conducted and for a sufficient time thereafter to allow flammable vapors from drying coatings or paints to be exhausted. Ventilation shall reduce the concentration of air contaminant to the degree a hazard does not exist. The exhaust discharge point of fumes shall be not less than ten feet from any combustible exterior wall or roof nor shall the discharge be in the direction of any combustible construction or unprotected opening in any non-combustible exterior wall within 50 feet.
- E. Provide adequate illumination while work is in progress, including explosion-proof lights and electrical equipment.
  - 1. Whenever required by the Director's Representative, provide additional illumination and necessary supports to cover all areas to be inspected.
  - 2. The level of illumination for inspection purposes shall be determined by the Director's Representative.
- F. Comply fully with the manufacturer's recommendations as to environmental conditions under which the coating and coating systems can be applied

1.06 SAFETY AND HEALTH REQUIREMENTS

- A. Provide and require use of personnel protective equipment for persons working in or about the project Site, all in accordance with requirements set forth by

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regulatory agencies applicable to the construction industry, the coating manufacturer's printed instructions, and appropriate technical bulletins and manuals.

1. Protective helmets shall be worn by all persons while in the vicinity of the Work.
2. Workers engaged in or near the Work during abrasive blasting shall wear eye and face protection devices, and air purifying half mask or mouthpiece respirator with appropriate filter.
3. Furnish protective clothing, gloves and barrier creams in accordance with the coating manufacturer's recommendations to prevent injury to workmen from strong chemicals during their application.

PART 2 PRODUCTS

2.01 PAINT MANUFACTURERS

- A. Where noted, the following finish paint manufacturers produce the paint types specified.
  1. Benjamin Moore and Co., 51 Chestnut Ridge Rd., Montvale, NJ 07645, (201) 573-9600.
  2. ICI Dulux Paints, 4000 Dupont Cr., Louisville, KY 40207, (800) 984-5444.
  3. PPG Architectural Finishes, One PPG Plaza, Pittsburgh, PA 15272, (800) 441-9695.
  4. Sherwin-Williams Co., Cleveland, OH 44101; 1-800-321-8194.
  5. Carboline Co., St. Louis MO. 63146; 1-800-848-4645

2.02 MISCELLANEOUS PRODUCTS

- A. Cleaning Solvents: Low toxicity with flash point in excess of 100 degrees F.
- B. Color Pigments: Pure, non-fading, finely ground pigments with at least 99 percent passing a 325 mesh sieve.
  1. Use lime-proof color pigments on masonry, concrete and plaster.
  2. Use exterior pigments in exterior paints.
- C. Bedding Compound: Water based pre-mixed gypsum wallboard joint compound
- D. Masking Tape: Removable paper or fiber tape, self-adhesive and nonstaining.
- E. Metal Filler: Polyester resin base autobody filler.
- F. Mineral Spirits: Low odor type recommended by finish paint manufacturer.
- G. Paint Stripper: As recommended by finish paint manufacturer.
- H. Stain Blocker, Primer-Sealer: As recommended by finish paint manufacturer.
- I. Turpentine: ASTM D 13.

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- J. Spackling Compound: Water based pre-mixed plaster and gypsum wallboard finishing compound.

2.03 FINISH PAINT TYPES

- A. Physical Properties:
1. Specified percent solids by weight and volume, pigment by weight, wet and dry film thickness per coat, and weight per gallon are minimum physical properties of acceptable materials.
    - a. Opaque Pigmented Paints: Physical properties specified are for white titanium dioxide base before color pigments are added.
    - b. Specified minimum wet and dry film thickness per coat are for determining acceptable finish paint products. Minimum wet and dry film thickness per coat to be applied shall comply with approved finish paint manufacturer's product data sheets.
  2. Gloss or Reflectance: The following ASTM D 523 specified light levels and angles of reflectance:
    - a. Semi-gloss: Between 30 and 65 at 60 degrees.
    - b. Gloss: Over 65 at 60 degrees.
- B. Exterior Finish Paint Types (Doors and Frames):
1. Paint Type GXL (Gloss Exterior Latex): Exterior Acrylic Latex, Gloss Enamel.
    - a. Solids by Weight: 40.0 percent.
    - b. Solids by Volume: 32.0 percent.
    - c. Solvent: Water.
    - d. Vehicle: 100 percent acrylic resin.
    - e. Weight Per Gallon: 10.0 lbs.
    - f. Wet Film Thickness: 3.4 mils.
    - g. Dry Film Thickness: 1.2 mils.
    - h. Manufacturers: Benjamin Moore, PPG, Sherwin- Williams, Carboline.
- C. Interior Finish Paint Types (Walls):
1. Paint Type SGIL (Semi-gloss Interior Latex): Interior Acrylic Latex, Semi-gloss Enamel.
    - a. Solids by Weight: 49.0 percent.
    - b. Solids by Volume: 35.0 percent.
    - c. Solvent: Water.
    - d. Vehicle: Vinyl acrylic resin.
    - e. Weight Per Gallon: 10.0 lbs.
    - f. Wet Film Thickness: 3.8 mils.
    - g. Dry Film Thickness: 1.2 mils.
    - h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams Carboline
- D. Colors: Provide paint colors shown on contract drawings or to be selected by the Director from finish paint manufacturers available color selections.
1. Approved finish paint manufacturers to match designated colors of other manufacturers where colors are shown on contract documents.

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2.04 COATING SYSTEMS

A. Coating systems described below are to be used for concrete and masonry filler, and all structural steel priming and finish coats.

B. Type C-1 System: Block/Concrete Filler, Acrylic Intermediate and Finish Coats as follows:

1. Filler: Acrylic resin designed for use on exterior and interior cast-in-place or precast concrete surfaces, 60 percent solids by volume.
2. Intermediate and Finish Coats: Water reducible, 100 percent acrylic, 38 percent solids by volume.
3. Acceptable Coating System: Heavy Duty Block Filler B42 W46, DTM Acrylic Intermediate and Finish Coating B66-200 by The Sherwin-Williams Company

C. Type C-2 System: Structural Steel Primer and Finish Coat - Self Priming, two component polyamide epoxy, 86% solids by volume.

1. Acceptable Coating system: Carbomastic 94 Self-Priming and Finish Coating by Carboline Company. SSPC SP2 and SP3 are acceptable preparation methods for the above system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be prepared, primed, or painted for compliance with contract documents, required environmental conditions, manufacturer's product data sheets, product label instructions and other written requirements.

1. Do not begin any phase of the work without first checking and verifying that surfaces and environmental conditions are acceptable for such work and that any earlier phase deficiencies and discrepancies have been properly corrected.
  - a. The commencement of new work shall be interpreted to mean acceptance of surfaces to be affected.

3.02 PREPARATION

A. Protection: Cover and protect surfaces to be painted, adjacent surfaces not to be painted, and removed furnishings and equipment from existing paint removals, airborne sanding particles, cleaning fluids and paint spills using suitable drop cloths, barriers and other protective devices.

1. Adjacent exterior surface protections include roofs, walls, landscaping, driveways and walkways. Interior protections include floors, walls, furniture, furnishings and electronic equipment.
2. Remove and replace removable hardware, lighting fixtures, telephone equipment, and other devices and cover plates over concealed openings in substrates to be painted.

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- a. Cover and neatly mask permanently installed hardware, lighting fixtures, cover plates and other devices which cannot be removed and are not scheduled for painting.
  3. Schedule and coordinate surface preparations so as not to interfere with work of other trades or allow airborne sanding dust particle to fall on freshly painted surfaces.
  4. Provide adequate natural or mechanical ventilation to allow surfaces to be prepared and painted in accordance with product manufacturer's instructions and applicable regulations.
  5. Provide and maintain "Wet Paint" signs, temporary barriers and other protective devices necessary to protect prepared and freshly painted surfaces from damages until Work has been accepted.
- B. Clean and prepare surfaces to be painted in accordance with specifications, paint manufacturer's approved product data sheets and printed label instructions. In the event of conflicting instructions or directions, the more stringent requirements shall apply.
  1. Cleaners: Use only approved products manufactured or recommended by finish paint manufacturer. Unless otherwise recommended by cleaner manufacturer, thoroughly rinse with clean water to remove surface contaminants and cleaner residue.
- C. Surfaces:
  1. Existing Painted Substrates: Thoroughly clean to remove dirt, soot, grease, mildew, chalkiness and stains using finish paint manufacturer's recommended cleaners.
    - a. Remove loose, peeling, cracked and blistered paint by chipping, scraping, and sanding smooth with medium and fine sandpaper
    - b. Fill surface holes and depressions with finish paint manufacturer's recommended filler and sand smooth to adjacent undisturbed edges.
    - c. Touch-up bare spots on previously painted surfaces with finish paint manufacturer's recommended primer.
    - d. Sand existing semi-gloss and gloss paint surfaces to a uniform smooth dull finish before painting.
    - e. Fill and sand smooth existing paint surface damages, depressions, ridges and other imperfections that will remain visible after new paints have been applied.
  2. Steel Doors and Frames: Fill indentations and cracks with metal filler; sand smooth to match adjacent undamaged surfaces
  3. Steel Substrates:
    - a. Prepare steel in accordance with Structural Steel Painting Council (SSPC) standards:
      - 1) SSPC-SP1: Remove oil, grease, dirt, soil, salts, and other surface contaminants using appropriate cleaning solvents and clean rags, vapor, alkali, emulsion, or steam and adequate ventilation.

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- 2) SSPC-SP2: Remove loose rust, mill scale, and paint to the degree specified by hand chipping, scraping, sanding, and wire-brushing.
  - 3) SSPC-SP3: Remove loose rust, mill scale, and paint to the degree specified by power-tool chipping, descaling, sanding, wire-brushing, and grinding.
  - 4) SSPC-SP5: Remove all visible rust, mill scale, paint, and foreign matter by white-metal blast cleaning with wheel or nozzle (dry or wet) using sand, grit, or shot.
  - 5) SSPC-SP6: Remove all visible rust, mill scale, paint, and foreign matter by commercial blast cleaning until at least two-thirds of each element of the surface is free of all visible residues.
  - 6) SSPC-SP10: Near white blast cleaning for heat resistant paints.
4. Galvanized Metal:
    - a. Allow new galvanized surfaces to weather as long as possible before cleaning. Remove surface contaminants using clean rags and petroleum spirits.
    - b. Remove "white rust" using appropriate solvent and, if necessary, wire brushing or sanding.
    - c. Use appropriate Structural Steel Painting Council Standard SSPC-SP1 to SSPC-SP6 to prepare steel substrates where galvanized protection has been removed.
  5. Gypsum Wallboard:
    - a. Fill cracks, holes, and other indentations smooth to adjacent surfaces using specified bedding, spackling, and finishing compounds.
    - b. Gypsum Wallboard: Fill and sand smooth minor bedding and finishing compound defects.
    - c. Vacuum and wipe surfaces free of all sanding residue and dust.
  6. Other Substrates: See finish paint manufacturer's recommendations.
- D. Painting Material Preparations:
1. Prepare painting materials in accordance with manufacturer's approved product data sheets and printed label instructions.
    - a. Stir materials before and during application for a consistent mixture of density. Remove container surface paint films before stirring and mixing.
    - b. Slightly tint first opaque finish coat where primer and finish coats are the same color.
    - c. Do not thin paints unless allowed and directed to do so in writing within limits stated on approved product data sheets.

3.03 PAINTING SCHEDULE



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- A. Interior Walls: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following interior substrates:
  - 1. Paint Type SGIL (Semi-Gloss Interior Latex): ~~See Refer to Room-Finish~~ **approved Schedule submittal** for all locations.
- B. Doors and Frames: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following substrates:
  - 1. Paint Type GXL (Gloss Exterior Latex): **Refer to approved Schedule submittal** for all door and frame locations
- C. Existing Structural Steel: Unless otherwise specified, apply the following paint types with manufacturer's recommended primers on the following substrates:
  - 1. Coating System C-2: All deteriorating interior and exterior structural steel shall receive this coating system

3.04 APPLICATION

- A. Environmental Conditions:
  - 1. Water-based Paints: Apply when surface temperatures will be 50 degrees Fahrenheit to 90 degrees Fahrenheit throughout the drying period.
  - 2. Other Paints: Apply when surface temperatures will be 45 degrees Fahrenheit to 95 degrees Fahrenheit throughout the drying period.
  - 3. Apply exterior paints during daylight hours free from rain, snow, fog and mist when ambient air conditions are more than 5 degrees above the surface dew point temperature and relative humidity less than 85 percent.
    - a. When exterior painting is allowed or required during noonday light hours, provide portable outdoor weather recording station with constant printout showing hourly to diurnal air temperature, humidity, and dew point temperature.
  - 4. Exterior Cold Weather Protection: Provide heated enclosures necessary to maintain specified temperature and relative humidity conditions during paint application and drying periods.
- B. Application: Apply approved paints where specified, or shown on the drawings, and to match approved field examples.
  - 1. Applicators: Brushes, rollers or spray equipment recommended by the paint manufacturer and appropriate for the location and surface area to be painted.
    - a. Approved minimum wet and dry film thicknesses for each coat shall be as recommended on approved product data sheets and the same for each application method and substrate.
- C. Paint Type Coats To Be Applied: Unless otherwise specified, or recommended by finish paint manufacturer's product data sheet and approved by submittal, the number of coats to be applied for each paint type are as follows:
  - 1. Acrylic Latex Paint Types GXL and SGIL:
    - a. New Unpainted Surfaces: Apply 1 coat of primer and 2 coats of finish paint.
    - b. Existing Painted Surfaces:
      - 1) Apply 2 coats of finish paint when existing paint has a lower gloss.

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- 2) Apply one coat of primer and 2 finish coats when existing paint has a higher gloss.
  - c. Paint Type SGIL: Provide mildewcide additive for bathrooms, kitchens, janitor closets, laundry rooms, restrooms and other wet or damp areas.
2. Block Filler, Steel Primer, Steel Finish Coats
  - a. Pitted Concrete & Concrete Masonry Surfaces: Use block filler as primer/sealer where allowed by finish paint manufacturer.
  - b. Existing Structural Steel:
    - 1) Primed Steel: Apply 2 coats of finish paint.
    - 2) Unprimed Steel: Apply 1 coat of Paint Type ESP or ISP, depending upon exterior or interior location.
      - a) If top coated, apply additional coat of finish paint manufacturer's galvanized primer and 2 coats of finish paint.
3. Other Paint Types: Apply in accordance with paint manufacturer's product data sheets.

3.05 ADJUSTING AND CLEANING

- A. Reinstall removed items after painting has been completed.
  1. Restore damaged items to a condition equal to or better than when removed. Replace damaged items that cannot be restored.
- B. Touch up and restore damaged finish paints. Touch up and restoration paint coats are in addition to the number of specified finish paint coats.
- C. Remove spilled, splashed, or spattered paint without marring, staining or damaging the surface. Restore damaged surfaces to the satisfaction of the Director's representative.
- D. Remove temporary barriers, masking tape, and other protective coverings upon completion of painting, cleaning and restoration work.

END OF SECTION

SECTION 099000  
CONSTRUCTION AND RESTORATION PAINTING

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SECTION 099100  
PIPE AND EQUIPMENT PAINTING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work included

1. Furnish all painting materials and equipment and perform all labor necessary to provide a finished and completely acceptable painting/finishing job for the pipe and mechanical equipment.
2. Conduct work in accordance with all applicable regulations (e.g., OSHA).
3. Remove and dispose of all materials resulting from the work in accordance with all applicable regulations.
4. Provide markers, labels, tags, and signs for pipe and equipment.

1.2 QUALITY ASSURANCE

- A. All painting materials shall remain in their original containers with manufacturers' label intact. The following information shall appear on all painting material labels:

1. Manufacturer's name
2. Product name and number
3. Color
4. Batch number

- B. All painting work shall be done in strict accordance with the paint manufacturer's published instructions in concert with this section of the specifications. Where manufacturer's recommended materials, surface preparation, number of coats or mil thicknesses exceed those shown in the specifications, the recommendations of the manufacturer shall govern.

C. Field Quality Control

Field painting shall be performed by an approved painting subcontractor. Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such applications as an industrial coatings applicator.

- D. Maintain throughout the duration of the application a crew of painters that are fully qualified.

- E. The Contractor shall coordinate the paint products to be used such that shop and field coats are compatible. The Contractor shall coordinate the use of coatings such that shop coatings and field coatings are supplied by the same manufacturer, and that shop and field coats are compatible.

- F. The Contractor will warranty his workmanship for a period of one year from the date of completion. The Contractor will supply labor and material at no cost to the owner for the repair / touchup of any area where the newly applied coating has flaked or peeled.

- G. The painting contractor must monitor the daily activities associated with the application of all materials. Accordingly, the Contractor will keep a daily log recording the following:

1. Ambient conditions (relative humidity and dew point)
2. Substrate temperatures
3. Batch numbers of materials
4. Mixing data-thinning
5. Dry film thickness readings for each coat applied (before & after).

H. Reference Standards

1. American Society for Testing and Materials
  - a. ASTM D 2246, Freeze-Thaw Test
  - b. ASTM D 2247, Humidity Test
  - c. ASTM B 117, Salt Spray Test
  - d. ASTM E 84, Surface Burning Characteristics Test
  - e. ASTM D 16 Terminology relating to Paint, Varnish, Lacquer, and Related Products
  - f. ASTM D 1005 Test for determining dry film thickness
2. Federal Specification

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PIPE AND EQUIPMENT PAINTING

- a. TT-C-555B, Section 4.4.7 Wind Driven Rain Test
- 3. Steel Structures Painting Council
  - a. Steel Structures Painting Manual, Volume 11, Systems & Specifications
- 4. The Society for Protective Coatings:
  - a. SSPC-SP-1 Solvent Cleaning
  - b. SSPC-SP-2 Hand Tool Cleaning
  - c. SSPC-SP-3 Power Tool Cleaning

1.3 SUBMITTALS

- A. The following items shall be submitted to the Engineer in accordance with the General Provisions:
  - 1. Paint Schedule - A comprehensive and complete schedule of surface preparations and paint systems shall be submitted. This schedule shall list all interior and exterior surfaces and all major equipment and piping to be painted by room, area or location. The schedule shall reflect the paint manufacturer's recommendations for the coating systems and shall contain certification that the manufacturer's representative has reviewed and approved the schedule. For each room or area to be painted the schedule shall present the following information in neat and tabular form:
    - a. Location, room or area name (e.g., Blower Room, Primary Sludge Pump Room, etc.)
    - b. All surfaces or items to be painted (e.g., pump, sludge discharge piping, etc.).
    - c. Paint system identification per section 3.08 below
    - d. Color for prime, intermediate and finish coats for all surfaces or items to be painted including manufacturers' alphanumeric code and generic name (e.g., AY 82 Arctic Ice).
    - e. Notes, remarks or comments on any proposed deviations, special conditions, treatment or application requirements.
    - f. Painting status at time of installation (e.g., bare steel, primed, etc.)
    - g. The schedule shall also contain the name of the paint manufacturer and information on the manufacturer's representative who will coordinate and/or inspect the work including name, address and telephone number. The schedule shall be submitted as soon as possible following the award of the contract so that the approved schedule may be used to identify colors and to specify shop paint systems for fabricated equipment.
    - h. Colors – for pipe and banding, as required – shall be as noted in the Piping Color and Label Schedule (Section 3.7) or other sections in this specification subject to final selection by the Engineer during review of submittals.
    - i. Colors for building areas, equipment, etc. will be selected by the Engineer during review of the paint schedule. The Contractor shall submit chips with the paint schedule to aid in color selection. Color names and/or numbers will be identified according to the appropriate color chart issued by the manufacturer of the respective product.
  - 2. Manufacturer's technical data sheets for each paint/coating giving descriptive data, curing time, mixing, thinning and application instructions.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in sealed containers with manufacturer's label intact.
- B. Storage of Material
  - 1. Store materials in a protective area at a temperature between 40°F and 110°F, unless otherwise required by the product manufacturer.

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PIPE AND EQUIPMENT PAINTING

1.5 JOB CONDITIONS

- A. Apply coatings only under the following prevailing environmental conditions:
  - 1. Air and surface temperature are not below 50°F or above 110°F. Refer to specific product data sheets for minimum surface temperature requirements. Surface temperature shall be at least 5 degrees F above dew point and in a rising mode.
  - 2. Relative humidity is not greater than 85% and the surface temperature is at least 50°F above the dew point.
  - 3. The atmosphere is relatively free of airborne dust.
  - 4. Or as otherwise required by product manufacturers.

1.6 SAFETY AND HEALTH REQUIREMENTS

- A. In accordance with requirements set forth by regulatory agencies applicable to the construction industry and the manufacturer's printed data sheets and appropriate technical bulletins and manuals, the Contractor shall instruct his employees in the proper use of all materials and protect his employees as required by OSHA.
- B. Head, face, eye, and ear protection will be provided by the Contractor to his employees. Barrier creams shall be used to protect the workers skin.
- C. All ladders and scaffolding must conform to the applicable safety requirements of OSHA.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Unless otherwise specified materials shall be products of the following manufacturer/supplier or equal:
  - 1. Tnemec Company, Inc. (paints and coating systems)
  - 2. Carboline
  - 3. Approved Equal

PART 3 EXECUTION

3.1 GENERAL PAINTING NOTES

- A. All coatings specified herein for new equipment and materials are in addition to shop coating specified elsewhere.
- B. Apply coatings with brush or roller, spray paint only with Engineer's approval.
- C. Coatings shall be free from imperfections; unacceptable work will be given additional coats, if required, at no additional costs to the Owner.
- D. The Contractor shall provide all scaffolding, staging, etc., required to perform his work. Place scaffolding to avoid interference with others.
- E. Damaged shop coatings shall be cleaned and retouched before any successive field painting is done.
- F. Shop primers shall be compatible with finish coats specified.
- G. New Caulking shall not be painted.
- H. Application of field coating(s) to prepared surface/substrate will constitute Contractor's acceptance of surface/substitute.
- I. In areas scheduled to be finished, electrical conduit and miscellaneous piping, including piping by other Contracts, shall be painted to match adjacent ceilings and walls unless otherwise required by this specification or allowed by the Owner.
- J. Painted surfaces shall be fully finished and cured prior to installation of insulating materials or signs.

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- K. Protection: The painting contractor must take the necessary precautions to protect the equipment / fixtures adjacent to the work area, which are not scheduled for painting.

3.2 SANDBLASTING

- A. Sandblasting shall conform to the Steel Structures Painting Council's System and Specifications.
- B. Proportions of sand, grit or shot shall be adjusted as necessary to produce a prepared surface equivalent of the approved sample.
- C. Application of protective coatings shall be within 24 hours after blast cleaning.  
Surfaces showing any traces of rust shall be blasted again before application of protective coatings.
- D. In areas where assemblies are scheduled to receive a sandblasted surface preparation and portions of the assembly have been previously coated, all prior coatings shall be removed by blast cleaning to the extent necessary for proper adhesion of the specified coating.
- E. Work, including but not limited to sandblasting, painting, and disposal of work materials, shall be performed in accordance with all applicable regulations (e.g., OSHA 20 CFR 1926.62).

3.3 APPLICATION

- A. Mix and thin materials in accordance with the manufacturer's printed instructions.
- B. Apply materials at specified thickness by method recommended by the manufacturer.
- C. Allow each coat to dry thoroughly before recoating.
- D. Vary color slightly to indicate each successive coating.
- E. Cut in edges clean and sharp where work joins other materials or colors.
- F. Make finish coats smooth, uniform in color and free of brush marks, laps, runs and missed areas.

3.4 INSPECTION

- A. Surface Cleanliness: Surface of abrasive blast-cleaned steel shall comply with the SSPC pictorial standards.
- B. Surface Profile: The surface profile for ferrous metal scheduled to receive protective coatings shall be between 20 and 30% of the total dry film thickness for the completed system.

3.5 CLEANING

- A. Remove paint spatters from finished areas.
- B. Repair any damage to coatings or surfaces caused by cleaning operation.
- C. Remove debris from job site and leave storage area clean.

3.6 SYSTEMS FOR PAINTING AND FINISHING

A. General

- 1. System C – Applicable for Exterior Structural Steel and Miscellaneous Metal, and Bollards.  
Surface Preparation: SSPC-SP6 Commercial blast cleaning.  
Prime Coat: Tnemec Series 90-97 Zinc (shop Applied) 2.5-3.5 mils DFT. Tnemec 901K97 is used for field touch-up.  
Intermediate Coat: Tnemec Series N69 Epoxoline @ 3.0-5.0 mils DFT.  
Finish Coat: Tnemec Series 1075U – (color)Endura Shield @ 2.0-3.0 mils DFT.
- 2. System F – Applicable for New Interior Miscellaneous Metal and Structural Steel, Pumps and Motors, Ductile Iron and Steel Piping, Valves and Non-Stainless Steel Ferrous Appurtenances.  
Surface Preparation: SSPC-SP6 Commercial blast cleaning (if item not subject to immersion). SSPC-SP10 Near White Blast (if item is subject to immersion).  
Prime Coat: Tnemec Series 1 Primer (shop Applied) @ 2.0-3.0 Mils DFT.  
Intermediate Coat: Tnemec Series N69 (color) @ 4.0-5.0 mils DFT.  
Finish Coat: Tnemec Series N69 (color) @ 4.0-6.0 mils DFT.

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PIPE AND EQUIPMENT PAINTING

3.7 PIPING COLOR AND LABEL SCHEDULE

- A. All piping painting, banding and labeling shall be in accordance with the “Recommended Standards for Wastewater Facilities,” published by the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. The following labels and colors shall be used, as applicable:

<u>Piping Type and Label</u>	<u>Color</u>
Raw Sludge	Brown with Black Band
Sludge Recirculation Suction	Brown with Yellow Bands
Sludge Draw Off	Brown with Orange Bands
Sludge Recirculation Discharge	Brown
Sludge Gas	Orange
Natural Gas	Orange with Black Bands
Non-Potable Water	Blue with Black Bands
Potable Water	Blue
Chlorine	Yellow
Sulfur Dioxide	Yellow with Red Bands
Sewage	Gray
Compressed Air	Green
Fuel Oil/Diesel	Red
Plumbing Drain/Vent	Black
Polymer	Purple

B. WASTE MANAGEMENT

1. General Requirements:
  - a. Place materials defined as hazardous in designated containers.
  - b. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
  - c. Do not dispose of paints or solvents by pouring on ground. Place in designated containers for proper disposal per State and Federal regulations. A copy of the shipping manifest shall be provided to the Engineer.

END OF SECTION



SECTION 099100  
PIPE AND EQUIPMENT PAINTING

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## **Division 10**



SECTION 101400  
SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Panel signs.
2. Signage accessories

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, and braille layout.

C. Samples for Initial Selection: For each type of sign material indicated that involves color selection.

1. Panel Signs: Samples of each finish type and color, on not less than 4-inch squares of plastic material, showing the full range of colors available

D. Samples for Verification: For each type of sign, include the following Samples to verify color selected:

1. Panel Signs: Full-size Samples of each type of sign required.
2. Approved samples will be returned for installation into Project.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by signage manufacturer.

B. Source Limitations: Obtain each sign type through one source from a single manufacturer.

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### SIGNAGE

- C. Regulatory Requirements: Comply with ANSI A.117.1 - 2017 and with code provisions as adopted by authorities having jurisdiction.

- 1. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
  - a. Signs for Accessible Spaces.

#### 1.5 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.
  - 1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

## PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Manufacturers of Panel Signs:
    - a. ASE (Architectural Signs and Engraving) Manufacturing.
    - b. Mohawk Sign Systems.
    - c. Tactile Signage Inc.

#### 2.2 PANEL SIGNS

- A. General: Provide signs that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
  - 1. Produce sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally.
  - 2. Sign materials shall meet a Class A finish.
- B. Panel Signs: Sand carved 1/8 inch (3.1 mm) thick melamine plastic. Provide lettering, graphics and background materials in colors as selected by Architect.
  - 1. Produce smooth, even, level sign surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.58 mm) measured diagonally.
  - 2. Lettering and Braille Content: Provide uppercase letters raised 1/32 inch (.79 mm), and grade 2 braille for each specific location. Minimum text height: 5/8 inch (15.8 mm).

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### SIGNAGE

3. Pictograms: Provide graphics raised 1/32 inch (.79 mm), with minimum 6 inch (152.4 mm) high background field, and lettering and braille written description directly below.
4. Lettering Style: Gill Sans upper case.
5. Copy Location: Centered.
6. Corners and Edges: Radius corners and square edges.
7. Product: One of the following:
  - a. "Blast Etched Melamine Series 100" by ASE (Architectural Signs and Engraving) Manufacturing.
  - b. Series 200A, Sand Carved by Mohawk Sign Systems.
  - c. Melamine Graphic Blast by Tactile Signage Inc
8. Provide specified signage as scheduled.

#### 2.3 PANEL ACCESSORIES

- A. Mounting Methods: Use stainless steel exposed fasteners.
- B. Anchors and Inserts: Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. General: Locate interior wall signs and accessories where indicated, in accordance with ANSI A.117.1 - 2017 and with code provisions as adopted by authorities having jurisdiction, using mounting methods of the type described and in compliance with the manufacturer's instructions.
  1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
  2. Mount signs on wall adjacent to the latch side of door, unless otherwise indicated. Where there is no wall space to the latch side of the door, including at double leaf doors, mount

## SECTION 101400

### SIGNAGE

sign on the nearest adjacent wall as approved by the Architect. Mount signs at 48-inches (1219 mm) from the baseline of the lowest characters to the finished floor.

3. Locate signs to allow approach within 3-inches (75 mm) of sign without encountering protruding objects or standing within swing of door.

B. Wall-Mounted Panel Signs: Attach signs to wall surfaces using methods indicated below:

1. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

### 3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

### 3.4 SIGN SCHEDULE

- A. Provide 10 signs with content and in location as directed by the Architect.

END OF SECTION 101400

SECTION 105200  
FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Portable fire extinguishers.
  - 2. Fire-protection accessories.
- B. Provide 10 fire extinguishers on brackets, in locations as directed by the Architect.

1.2 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.
  - 1. Fire Extinguishers: Include rating and classification.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."
- C. Fire Extinguishers: FM listed and labeled for type, rating, and classification specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. J.L. Industries, Inc.
  - 2. Kidde: Walter Kidde, The Fire Extinguisher Co.
  - 3. Larsen's Manufacturing Company.
  - 4. Potter-Roemer; Div. of Smith Industries, Inc.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366/A 366M, commercial quality, stretcher leveled, temper rolled.
- B. Stainless-Steel Sheet: ASTM A 666, Type 304.



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FIRE-PROTECTION SPECIALTIES

2.3 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
- B. Multipurpose Dry-Chemical Type: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, in enameled-steel container. Provide one of the following:
  - 1. 10# ABC Badger 10MB-8H with optional bracket - Class 4A-80BC or 5# ABC Badger 5MB-6H with optional bracket - Class 3A-40BC.
  - 2. Buckeye 10# ABC (tall), part #11340 or 5# ABC, part #10914
  - 3. Amerex 10# ABC Aluminum Tall model B456 or Amerex 5# ABC Aluminum model B402/B402T.

2.4 ACCESSORIES

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure extinguisher, of sizes required for types and capacities of extinguishers indicated, with plated or baked-enamel finish. Provide brackets for all extinguishers..
- B. Identification: Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location. Locate as indicated by Architect.
  - 1. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
  - 1. Remove and replace damaged, defective, or undercharged units.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing fire-protection specialties.
- B. Install in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
  - 1. Fasten mounting brackets to structure, square and plumb.

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FIRE-PROTECTION SPECIALTIES

END OF SECTION 105200

SECTION 105200  
FIRE-PROTECTION SPECIALTIES

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## **Division 26**



SECTION 260519  
WIRING, GENERAL – 600 VOLTS AND UNDER

PART 1 GENERAL

1.01 SUBMITTALS

- A. Data: Catalog sheets, specifications and installation instructions.

1.02 PRODUCT DELIVERY

- A. Mark and tag insulated conductors and cables for delivery to the site, include:
1. Contractor's name.
  2. Date of manufacture (month & year).
  3. Manufacturer's name.
  4. Data which explains the meaning of coded identification (UL assigned electrical reference numbers, UL assigned combination of color marker threads, etc.).
  5. Environmental suitability information (listed or marked "sunlight resistant" where exposed to direct rays of sun; wet locations listed/marked for use in wet locations; other applications listed/marked suitable for the applications).

PART 2 PRODUCTS

2.01 INSULATED CONDUCTORS AND CABLES

- A. Date of Manufacture: No insulated conductor more than one year old when delivered to the site will be acceptable.
- B. Acceptable Companies: American Insulated Wire Corp., BICC General Cable Industries Inc., Cerro Wire & Cable Co. Inc., Pirelli Cable Corp., or Southwire Co.
- C. Conductors: Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor. Conductor sizes No. 8 and larger shall be stranded.
- D. Types:
1. Electric Light and Power Wiring:
    - a. General: Rated 600V, NFPA 70 Type FEP, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, XHHW-2.
    - b. Metal-Clad Cable, NFPA 70 Article 334 Type MC:
      - 1) Interlocked flexible galvanized steel armor sheath, conforming to UL requirements for type MC metal clad cable.
      - 2) Insulated copper conductors, suitable for 600 volts, rated 90°C, one of the types listed in NFPA 70 Table 310-13 or of a type identified for use in Type MC cable.
      - 3) Internal full size copper ground conductor with green insulation.
      - 4) Acceptable Companies: AFC Cable Systems Inc., Coleman Cable Co.
      - 5) Connectors for MC cable: AFC Fitting Inc.'s AFC Series,

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WIRING, GENERAL – 600 VOLTS AND UNDER

Arlington Industries Inc.'s Saddle grip, or Thomas & Betts Co.'s Tite-Bite with anti-short bushings.

2. Class 1 Wiring:
  - a. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, NFPA 70 types KF-2, KFF-2, PAFF, PF, PFF, PGF, PGFF, PTF, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF.
  - b. Larger than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with NFPA 70 Article 310.
  - c. Conductor with other types and thickness of insulation may be used if listed for Class 1 circuit use.
3. Class 2 Wiring:
  - a. Multiconductor Cables: NFPA 70 Article 725, Types CL2P, CL2R, CL2.
  - b. Other types of cables may be used in accordance with NFPA 70 Table 725-61 "Cable Uses and Permitted Substitutions", as approved.
4. Class 3 Wiring:
  - a. Single Conductors No. 18 and No. 16 AWG: Same as Class 1 No. 18 and No. 16 AWG conductors except that:
    - 1) Conductors are also listed as CL3.
    - 2) Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings.
  - b. Multiconductor Cables: NFPA 70 Article 725, Types CL3P, CL3R, CL3.
  - c. Other types of cables may be used in accordance with NFPA 70, Table 725-61 "Cable Uses and Permitted Substitutions", as approved.

2.02 CONNECTORS

- A. General:
  1. Connectors specified are part of a system. Furnish connectors and components, and use specific tools and methods as recommended by connector manufacturer to form complete connector system.
  2. Connectors shall be UL 486 A listed, or UL 486 B listed for combination dual rated copper/aluminum connectors (marked AL7CU for 75 degrees C rated circuits and AL9CU for 90 degrees C rated circuits).
- B. Splices:
  1. Spring Type:
    - a. Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s B-Cap, Electrical Products Div./3M's Scotchlok Type Y, R, G, B, O/B+, R/Y+, or B/G+, or Ideal Industries Inc.'s Wing Nuts or Wire Nuts.
    - b. Rated 150° C, 600V; Ideal Industries Inc.'s High Temperature Wire-Nut Model 73B, 59B.
  2. Indent Type with Insulating Jacket:
    - a. Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s Crimp Connectors, Ideal Industries Inc.'s Crimp Connectors, Penn-Union Corp.'s Penn-Crimps, or Thomas & Betts Corp.'s STA-KON.
  3. Indent Type (Uninsulated): Anderson/Hubbell's Versa-Crimp, VERSAtile,

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- Blackburn/T&B Corp.'s Color-Coded Compression Connectors, Electrical Products Div./3M's Scotchlok 10000, 11000 Series, Framatome Connectors/Burndy's Hydent, Penn-Union Corp.'s BCU, BBCU Series, or Thomas & Betts Corp.'s Compression Connectors.
4. Connector Blocks: NIS Industries Inc.'s Polaris System, or Thomas & Betts Corp.'s Blackburn AMT Series.
  5. Resin Splice Kits: Electrical Products Div./3M's Scotchcast Brand Kit Nos. 82A Series, 82-B1 or 90-B1, or Scotchcast Brand Resin Pressure Splicing Method.
  6. Heat Shrinkable Splices: Electrical Products Div./3M's ITCN, Raychem Corp.'s Thermofit Type WCS, or Thomas & Betts Corp.'s SHRINK-KON Insulators.
  7. Cold Shrink Splices: Electrical Products Div./3M's 8420 Series.
- C. Gutter Taps: Anderson/Hubbell's GP/GT with GTC Series Covers, Blackburn/T&B Corp.'s H-Tap Type CF with Type C Covers, Framatome Connectors/Burndy's Polytap KPU-AC, H-Crimpit Type YH with CF-FR Series Covers, ILSCO's GTA Series with GTC Series Covers, Ideal Industries Inc.'s Power-Connect GP, GT Series with GIC covers, NSI Industries Inc.'s Polaris System, OZ/Gedney Co.'s PMX or PT with PMXC, PTC Covers, Penn-Union Corp.'s CDT Series, or Thomas & Betts Corp.'s Color-Keyed H Tap CHT with HTC Covers.
- D. Terminals: Nylon insulated pressure terminal connectors by Amp-Tyco/Electronics, Electrical Products Div./3M, Framatome Connectors/Burndy, Ideal Industries Inc., Panduit Corp., Penn-Union Corp., Thomas & Betts Corp., or Wiremold Co.
- E. Lugs:
1. Single Cable (Compression Type Lugs): Copper, 1 or 2 hole style (to suit conditions), long barrel; Anderson/Hubbell's VERSAtile VHCL, Blackburn/T&B Corp.'s Color-Coded CTL, LCN, Framatome Connectors/Burndy's Hylug YA, Electrical Products Div./3M Scotchlok 31036 or 31145 Series, Ideal Industries Inc.'s CCB or CCBL, NSI Industries Inc.'s L, LN Series, Penn-Union Corp.'s BBLU Series, or Thomas & Betts Corp.'s 54930BE or 54850BE Series.
  2. Multiple Cable (Mechanical Type Lugs): Copper, configuration to suit conditions; Framatome Connectors/Burndy's Qiklug Series, NSI Industries Inc.'s Type TL, Penn-Union Corp.'s VI-TITE Terminal Lug Series, or Thomas & Betts Corp.'s Color-Keyed Locktite Series.

2.03 TAPES

- A. Insulation Tapes:
1. Plastic Tape: Electrical Products Div./3M's Scotch Super 33+ or Scotch 88, Plymouth Rubber Co.'s Plymouth/ Bishop Premium 85CW.
  2. Rubber Tape: Electrical Products Div./3M's Scotch 130C, or Plymouth Rubber Co.'s Plymouth/Bishop W963 Plysafe.
- B. Moisture Sealing Tape: Electrical Products Div./3M's Scotch 2200 or 2210, or Plymouth Rubber Co.'s Plymouth/Bishop 4000 Plyseal-V.



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- C. Electrical Filler Tape: Electrical Products Div./3M's Scotchfil, or Plymouth Rubber Co.'s Plymouth/Bishop 125 Electrical Filler Tape.
- D. Color Coding Tape: Electrical Products Div./3M's Scotch 35, or Plymouth Rubber Co.'s Plymouth/Bishop Premium 37 Color Coding.
- E. Arc Proofing Tapes:
  - 1. Arc Proofing Tape: Electrical Products Div./3M's Scotch 77, Mac Products Inc.'s AP Series, or Plymouth Rubber Co.'s Plymouth/Bishop 53 Plyarc.
  - 2. Glass Cloth Tape: Electrical Products Div./3M's Scotch 27/Scotch 69, Mac Products Inc.'s TAPGLA 5066, or Plymouth Rubber Co.'s Plymouth/Bishop 77 Plyglas.
  - 3. Glass-Fiber Cord: Mac Products Inc.'s MAC 0527.

2.04 WIRE-PULLING COMPOUNDS

- A. To suit type of insulation; American Polywater Corp.'s Polywater Series, Electric Products Div./3M's WL, WLX, or WLW, Greenlee Textron Inc.'s Y-ER-EAS, Cable Cream, Cable Gel, Winter Gel, Ideal Industries Inc.'s Yellow 77, Aqua-Gel II, Agua-Gel CW, or Thomas & Betts Corp.'s Series 15-230 Cable Pulling Lubricants, or Series 15-631 Wire Slick.

2.06 TAGS

- A. Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inches high.
  - 1. Phenolic: Two color laminated engraver's stock, 1/16-inch minimum thickness, machine engraved to expose inner core color (white).
  - 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

2.07 WIRE MANAGEMENT PRODUCTS

- A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc: Catamount/T&B Corp., or Ideal Industries Inc.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install conductors in raceways after the raceway system is completed. Exceptions: Type MC, or other type specifically indicated on the drawings not to be installed in raceways.
- B. No grease, oil, or lubricant other than wire-pulling compounds specified may be used to facilitate the installation of conductors.

SECTION 260519  
WIRING, GENERAL – 600 VOLTS AND UNDER

3.02 CIRCUITING

- A. Do not change, group or combine circuits other than as indicated on the drawings.

3.03 COMMON NEUTRAL CONDUCTOR

- A. A common neutral shall not be used for 2 or 3 branch circuits.

3.04 CONDUCTOR SIZE

- A. Conductor Size:
1. For Electric Light and Power Branch Circuits: Install conductors of size shown on drawings. Where size is not indicated, the minimum size allowed is No. 12 AWG.
  2. For Class 1 Circuits:
    - a. No. 18 and No. 16 AWG may be used provided they supply loads that do not exceed 6 amps (No. 18 AWG), or 8 amps (No. 16 AWG).
    - b. Larger than No. 16 AWG: Use to supply loads not greater than the ampacities given in NFPA 70 Section 310-15.
  3. For Class 2 Circuits: Any size to suit application.
  4. For Class 3 Circuits: Minimum No. 18 AWG.

3.05 COLOR CODING

- A. Color Coding for 208/120 Volt and 240/120 Volt Electric Light and Power Wiring:
1. Color Code:
    - a. 2 wire circuit - black, white.
    - b. 3 wire circuit - black, red, white.
    - c. 4 wire circuit - black, red, blue, white.
  2. White to be used only for an insulated grounded conductor (neutral). If neutral is not required use black and red, or black, red and blue for phase to phase circuits.
    - a. "White" for Sizes No. 6 AWG or Smaller:
      - 1) Continuous white outer finish, or:
      - 2) Three continuous white stripes on other than green insulation along its continuous length.
    - b. "White" for Sizes Larger Than No. 6 AWG:
      - 1) Continuous white outer finish, or:
      - 2) Three continuous white stripes on other than green insulation along its continuous length, or:
      - 3) Distinctive white markings (color coding tape) encircling the conductor, installed on the conductor at time of its installation. Install white color coding tape at terminations, and at 1' 0" intervals in gutters, pullboxes, and manholes.
  3. Colors (Black, Red, Blue):
    - a. For Branch Circuits: Continuous color outer finish.
    - b. For Feeders:
      - 1) Continuous color outer finish, or:
      - 2) Color coding tapes encircling the conductors, installed on the

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conductors at time of their installation. Install color coding tapes at terminations, and at 1' 0" intervals in gutter, pullboxes, and manholes.

- B. Color Coding For 277/480 Volt Electric Light and Power Wiring:
1. Color Code:
    - a. 2 wire circuit – brown, gray.
    - b. 3 wire circuit – brown, yellow, gray.
    - c. 4 wire circuit – brown, yellow, orange, gray.
  2. Gray to be used only for an insulated grounded conductor (neutral). If neutral is not required use brown and yellow, or brown, yellow and orange for phase to phase circuits.
    - a. "Gray" For Sizes No. 6 AWG or Smaller.
      - 1) Continuous gray outer finish.
    - b. "Gray" For Sizes Larger Than No. 6 AWG:
      - 1) Distinctive gray markings (color coding tape) encircling the conductor, installed on the conductor at time of its installation. Install gray color coding tape at terminations, and at 1' 0" intervals in gutters, pullboxes, and manholes.
    - c. Colors (Brown, Yellow, Orange):
    - d. For Branch Circuits: Continuous color outer finish.
    - e. For Feeders:
      - 1) Continuous color outer finish, or:
      - 2) Color coding tapes encircling the conductors, installed on the conductors at the time of their installation. Install color coding tapes at terminations, and at 1' 0" intervals in gutters, pullboxes, and manholes.
- C. More Than One Nominal Voltage System Within A Building: Permanently post the color coding scheme at each branch-circuit panelboard.
- D. Existing Color Coding Scheme: Where an existing color coding scheme is in use, match the existing color coding if it is in accordance with the requirements of NFPA 70.
- E. Color Code For Wiring Other Than Electric Light and Power: In accordance with ICEA/NEMA WC-30 "Color Coding of Wires and Cables". Other coding methods may be used, as approved.

3.06 IDENTIFICATION

- A. Identification Tags: Use tags to identify feeders and designated circuits. Install tags so that they are easily read without moving adjacent feeders or requiring removal of arc proofing tapes. Attach tags with non-ferrous wire or brass chain.
1. Interior Feeders: Identify each feeder in pullboxes and gutters. Identify by feeder number and size.
  2. Exterior Feeders: Identify each feeder in manholes and in interior pullboxes and gutters. Identify by feeder number and size, and also indicate building number and

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- panel designation from which feeder originates.
3. Street and Grounds Lighting Circuits: Identify each circuit in manholes and lighting standard bases. Identify by circuit number and size, and also indicate building number and panel designation from which circuit originates.

- B. Identification Plaque: Where a building or structure is supplied by more than one service, or has any combination of feeders, branch circuits, or services passing through it, install a permanent plaque or directory at each service, feeder and branch circuit disconnect location denoting all other services, feeders, or branch circuits supplying that building or structure or passing through that building or structure and the area served by each.

3.07 WIRE MANAGEMENT

- A. Use wire management products to bundle, route, and support wiring in junction boxes, pullboxes, wireways, gutters, channels, and other locations where wiring is accessible.

3.08 EQUIPMENT GROUNDING CONDUCTOR

- A. Install equipment grounding conductor:
1. Where specified in other Sections or indicated on the drawings.
  2. In conjunction with circuits recommended by equipment manufacturers to have equipment grounding conductor.
- B. Equipment grounding conductor is not intended as a current carrying conductor under normal operating circumstances.
- C. Color Coding For Equipment Grounding Conductor:
1. Color Code: Green.
  2. "Green" For sizes No. 6 AWG or Smaller:
    - a. Continuous green outer finish, or:
    - b. Continuous green outer finish with one or more yellow stripes, or:
    - c. Bare copper (see exception below).
  3. "Green" For Sizes Larger Than No. 6:
    - a. Stripping the insulation or covering from the entire exposed length (see exception below).
    - b. Marking the exposed insulation or covering with green color coding tapes.
    - c. Identify at each end and at every point where the equipment grounding conductor is accessible.

3.09 SPECIAL GROUNDING CONDUCTORS

- A. Technical Power System Grounding (Equipment grounding conductor isolated from the premises grounded conductor except at a single grounded termination point): Install an insulated grounding conductor running with the circuit conductors for isolated receptacles or utilization equipment requiring an isolated ground:
1. Color Code: Green.
  2. "Green" For Isolated Grounding Conductor:

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- a. Continuous green outer finish, or:
  - b. Continuous green outer finish with one or more yellow stripes, and:
  - c. Different than the “green” used for the equipment grounding conductor run with the circuit (where required).
3. Install label at every point where the conductor is accessible, identifying it as an “Isolated Grounding Conductor”.

3.10 ARC PROOFING

- A. Arc proof feeders installed in a common pullbox or manhole as follows:
1. Arc proof new feeders.
  2. Arc proof existing feeders that are spliced to new feeders.
  3. Arc proof each feeder as a unit (except feeders consisting of multiple sets of conductors).
  4. Arc proof feeders consisting of multiple sets of conductors by arc proofing each set of conductors as a unit.
  5. Arc proof feeders with half-lapped layer of 55 mils thick arc proofing tape and random wrapped or laced with glass cloth tape or glass-fiber cord. For arc proofing tape less than 55 mils thick, add layers to equivalent of 55 mils thick arc proofing tape.

3.11 INSULATED CONDUCTOR AND CABLE SCHEDULE - TYPES AND USE

- A. Electric Light and Power Circuits:
1. FEP, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, or XHHW-2: Wiring in dry or damp locations (except where special type insulation is required).
  2. THWN, THWN-2, XHHW, XHHW-2, USE, or USE-2: Wiring in wet locations (except where type USE or USE-2 insulated conductors are specifically required, or special type insulation is required).
  3. THHN, THWN or THWN-2: Wiring installed in existing raceway systems (except where special type insulation is required).
  4. THHN, THW-2, THWN-2, XHHW, or XHHW-2: Wiring for electric discharge lighting circuits (fluorescent, HID), except where fixture listing requires wiring rated higher than 90° C.
  5. USE, or USE-2: Wiring indicated on the drawings to be direct burial in earth.
  6. USE, or USE-2 Marked “Sunlight Resistant”:
    - a. Service entrance wiring from overhead service to the service equipment.
    - b. Wiring exposed to the weather and unprotected (except where special type insulation is required).
  7. MC:
    - a. Branch circuit wiring in movable metal partitions.
      - 1) Install conductors in accordance with partition manufacturer’s recommendations.
- C. Class 1 Circuits: Use Class 1 wiring specified in Part 2 (except where special type insulation is required).

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- D. Class 2 Circuits: Use Class 2 wiring specified in Part 2 (except where special type insulation is required).
- E. Class 3 Circuits: Use Class 3 wiring specified in Part 2 (except where special type insulation is required).

3.12 CONNECTOR SCHEDULE - TYPES AND USE

- A. Temperature Rating: Use connectors that have a temperature rating, equal to, or greater than the temperature rating of the conductors to which they are connected.
- B. Splices: Splices shall be used in lighting and 120V receptacle wiring only, and shall only be made in junction boxes:
  - 1. Dry Locations:
    - a. For Conductors No. 8 AWG or Smaller: Use spring type pressure connectors, indent type pressure connectors with insulating jackets, or connector blocks (except where special type splices are required).
    - b. For Conductors No. 6 AWG or Larger: Use connector blocks or uninsulated indent type pressure connectors. Fill indentions in uninsulated connectors with electrical filler tape and apply insulation tape to insulation equivalent of the conductor, or insulate with heat shrinkable splices or cold shrink splices.
    - c. Gutter Taps in Panelboards: For uninsulated type gutter taps fill indentions with electrical filler tape and apply insulation tape to insulation equivalent of the conductor, or insulate with gutter tap cover.
  - 2. Damp Locations: As specified for dry locations, except apply moisture sealing tape over the entire insulated connection (moisture sealing tape not required if heat shrinkable splices or cold shrink splices are used).
  - 3. Wet Locations: Use uninsulated indent type pressure connectors and insulate with resin splice kits, cold shrink splices or heat shrinkable splices. Exception: Splices above ground which are totally enclosed and protected in NEMA 3R, 4, 4X enclosures may be spliced as specified for damp locations.
- C. Terminations:
  - 1. For Conductors No. 10 AWG or Smaller: Use terminals for:
    - a. Connecting wiring to equipment designed for use with terminals.
  - 2. For Conductors No. 8 AWG or Larger: Use compression or mechanical type lugs for:
    - a. Connecting cables to flat bus bars.
    - b. Connecting cables to equipment designed for use with lugs.
  - 3. For Conductor Sizes Larger than Terminal Capacity on Equipment: Reduce the larger conductor to the maximum conductor size that terminal can accommodate (reduced section not longer than one foot). Use compression or mechanical type connectors suitable for reducing connection.

END OF SECTION

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SECTION 260526  
SERVICE GROUNDING AND BONDING

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ground Clamps (Cable to Pipe): Blackburn/T&B Corp.'s GUV, Framatome Connectors/Burndy Corp.'s GAR, GD, GP, GK, or OZ/Gedney Co.'s ABG, CG.
- B. Ground Clamps (Cable to Rod): Blackburn/T&B Corp.'s GG, GGH, JAB, JABH, GUV, Dossert Corp.'s GN, GPC, Framatome Connectors/Burndy Corp.'s GP, GX, GRC, or OZ/Gedney Co.'s ABG.
- C. Ground Lugs: Copper, 1 or 2 hole style (to suit conditions), long barrel; Anderson/Hubbell's VERSAtile VHCL, Blackburn/T&B Corp.'s Color-Coded CTL, LCN, Framatome Connectors/Burndy's Hylug YA, Electrical Products Div./3M Scotchlok 31036 or 31145 Series, Ideal Industries Inc.'s CCB or CCBL, or Thomas & Betts Corp.'s 54930BE or 54850BE Series.
- D. Exothermic Type Weld: Erico Inc.'s Cadweld Process, or Furseweld/T&B Corp.'s Exothermic Welding System.
- E. Compression Connectors: Amp Inc.'s Ampact Copper Grounding System, or Burndy Corp.'s Hyground System.
- F. Rod Electrodes: Copper clad (minimum 0.010 jacket) ground rods minimum 3/4 inches diameter by 10'-0" long.
- G. Plate Electrodes: Copper plates minimum 0.06 inches thick by 2'-0" square feet of surface area.
- H. Grounding Electrode Conductors and Bonding Conductors: Copper conductors, bare or insulated with THW, THW-2, XHHW, XHHW-2, THWN, THWN-2 or THHN insulation.
- I. Hardware: Silicon-bronze bolts, nuts, flat and lock washers etc. as manufactured by Dossert Corp., Framatome Connectors/Burndy Corp., or OZ/Gedney Co.



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SERVICE GROUNDING AND BONDING

PART 3 EXECUTION

3.01 INSTALLATION

- A. Connections:
1. Make grounding and bonding connections, except buried connections, with silicon-bronze hardware and ground clamps, ground lugs or compression connectors, to suit job conditions.
  2. For buried connections use exothermic type weld or compression connectors.

END OF SECTION

SECTION 260529  
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Shop Drawings: Show support details if different from methods specified or shown on the drawings.
- B. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 ANCHORING DEVICES

- A. Sleeve Anchors (FS FF-S-325 Group II, Type 3, Class 3): Molly/Emhart's Parasleeve Series, Phillips' Red Head AN, HN, FS Series, or Ramset's Dynabolt Series.
- B. Wedge Anchors (FS FF-S-325 Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly/Emhart's Parabolt Series, Phillips' Red Head WS, or Ramset's Trubolt Series.
- C. Self-Drilling Anchors (FS FF-S-325 Group III, Type 1): Phillips' Red Head Series S or Ramset's Ram Drill Series.
- D. Non-Drilling Anchors (FS FF-S-325 Group VIII, Type 1): Hilti's Drop-In Anchor Series, Phillips' Red Head J Series, or Ramset's Dynaset Series.
- E. Stud Anchors (FS FF-S-325 Group VIII, Type 2): Phillips' Red Head JS Series.

2.02 CAST-IN-PLACE CONCRETE INSERTS

- A. Continuous Slotted Type Concrete Insert, Galvanized:
  - 1. Load Rating 1300 lbs./ft.: Kindorf's D-986.
  - 2. Load Rating 2400 lbs./ft.: Kindorf's D-980.
  - 3. Load Rating 3000 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-H.
  - 4. Load Rating 4500 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-HD.
- B. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded.
- C. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept bolts having special wedge-shaped heads.

2.03 MISCELLANEOUS FASTENERS

- A. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work, selected from the following: Furnish galvanized fasteners for exterior use, or for items anchored to exterior walls, except where stainless steel is indicated.

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HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
  2. Lag Bolts: FS FF-B-561, square head type.
  3. Machine Screws: FS FF-S-92, cadmium plated steel.
  4. Machine Bolts: FS FF-B-584 heads; FF-N-836 nuts.
  5. Wood Screws: FS FF-S-111 flat head carbon steel.
  6. Plain Washers: FS FF-W-92, round, general assembly grade carbon steel.
  7. Lock Washers: FS FF-W-84, helical spring type carbon steel.
  8. Toggle Bolts: Tumble-wing type; FS FF-B-588, type, class and style as required to sustain load.
- B. Stainless Steel Fasteners: Type 302 for interior Work; Type 316 for exterior Work; Phillips head screws and bolts for exposed Work unless otherwise specified.
- 2.04 TPR (THE PEEL RIVET) FASTENERS
- A. 1/4 inch diameter, threadless fasteners distributed by Subcon Products, 315 Fairfield Road, Fairfield, NJ 07004 (800) 634-5979.
- 2.05 POWDER DRIVEN FASTENER SYSTEMS
- A. Olin Corp.'s Ramset Fastening Systems, or Phillips Drill Company Inc.'s Red Head Powder Actuated Systems.
- 2.06 HANGER RODS
- A. Mild low carbon steel, unless otherwise specified; fully threaded or threaded each end, with nuts as required to position and lock rod in place. Unless galvanized or cadmium plated, provide a shop coat of red lead or zinc chromate primer paint.
- 2.07 "C" BEAM CLAMPS
- A. With Conduit Hangers:
1. For 1 Inch Conduit Maximum: B-Line Systems Inc.'s BG-8, BP-8 Series, Caddy/Erco Products Inc.'s BC-8P and BC-8PSM Series, or GB Electrical Inc.'s HIT 110-412 Series.
  2. For 3 Inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf's 500 Series beam clamp with 6HO-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.
  3. For 4 Inch Conduit Maximum: Kindorf's E-231 beam clamp and E-234 anchor clip and C-149 series lay-in hanger; Unistrut Corp.'s P2676 beam clamp and P-1659A Series anchor clip with J1205 Series lay in hanger.
- B. For Hanger Rods:
1. For 1/4 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy/Erco Products Inc.'s BC, GB Electrical Inc.'s HIT 110, Kindorf's 500, 510, or Unistrut Corp.'s P1648S, P2398S, P2675, P2676.
  2. For 3/8 Inch Hanger Rods: Caddy/Erco Products Inc.'s BC, Kindorf's 231-3/8, 502,

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HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

- or Unistrut Corp.'s P1649AS, P2401S, P2675, P2676.
- 3. For 1/2 Inch Rods: Appleton Electric Co. BH-500 Series, Kindorf's 500 Series, 231-1/2, OZ/Gedney Co.'s IS-500 Series, or Unistrut Corp.'s P1650AS, P2403S, P2676.
- 4. For 5/8 Inch Rods: Unistrut Corp.'s P1651AS beam clamp and P1656A Series anchor clip.
- 5. For 3/4 Inch Rods: Unistrut Corp.'s P1653S beam clamp and P1656A Series anchor clip.

2.08 CHANNEL SUPPORT SYSTEM

- A. Channel Material: 12 gage steel.
- B. Finishes:
  - 1. Phosphate and baked green enamel/epoxy.
  - 2. Pre-galvanized.
  - 3. Electro-galvanized.
  - 4. Hot dipped galvanized.
  - 5. Polyvinyl chloride (PVC), minimum 15 mils thick.
- C. Fittings: Same material and finish as channel.
- D. UL Listed Systems:
  - 1. B-Line Systems Inc.'s B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).
  - 2. Grinell Corp.'s Allied Power-Strut PS 200 (1-5/8 x 1-5/8 inches), PS 150 (1-5/8 x 2-7/16 inches), PS 100 (1-5/8 x 3-1/4 inches).
  - 3. Kindorf's B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 x 3 inches).
  - 4. Unistrut Corp.'s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 x 3-1/4 inches).
  - 5. Versabar Corp.'s VA-1 (1-5/8 x 1-5/8 inches), VA-3 (1-5/8 x 2-1/2 inches).

2.09 MISCELLANEOUS FITTINGS

- A. Side Beam Brackets: B-Line Systems Inc.'s B102, B103, B371-2, Kindorf's B-915, or Versabar Corp.'s VF-2305, VF-2507.
- B. Pipe Straps:
  - 1. Two Hole Steel Conduit Straps: B-Line Systems Inc.'s B-2100 Series, Kindorf's C-144 Series, or Unistrut Corp.'s P-2558 Series.
  - 2. One Hole Malleable Iron Clamps: Kindorf's HS-400 Series, or OZ/ Gedney Co.'s 14-G Series, 15-G Series (EMT).
- C. Deck Clamps: Caddy/Erico Products Inc.'s DH-4-T1 Series.
- D. Fixture Stud and Strap: OZ/Gedney Co.'s SL-134, or Steel City's FE-431.

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- E. Supporting Fittings for Pendent Mounted Industrial Type Fluorescent Fixtures on Exposed Conduit System:
  - 1. Ball Hanger: Appleton Electric Co.'s AL Series, or Crouse-Hinds Co.'s AL Series.
  - 2. Flexible Fixture Hanger: Appleton Electric Co.'s UNJ-50, UNJ-75, or Crouse-Hinds Co.'s UNJ115.
  - 3. Flexible (Hook Type) Fixture Hanger: Appleton Electric Co.'s FHMF, or Crouse-Hinds Co.'s UNH-1.
  - 4. Eyelet: Unistrut Corp.'s M2250.
  - 5. Eyelet with Stud: Kindorf's H262, or Unistrut Corp.'s M2350.
  - 6. Conduit Hook: Appleton Electric Co.'s FHSN, or Crouse-Hinds Co.'s UNH-13.
- F. Supporting Fasteners (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy/Erco Products Inc.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Where specific fasteners are not specified or indicated for securing items to in-place construction, provide appropriate type, size, and number of fasteners for a secure, rigid installation.
- B. Install anchoring devices and other fasteners in accordance with manufacturer's printed instructions.
- C. Make attachments to structural steel wherever possible.

3.02 FASTENER SCHEDULE

- A. Material:
  - 1. Use cadmium or zinc coated anchors and fasteners in dry locations.
  - 2. Use hot dipped galvanized or stainless-steel anchors and fasteners in damp and wet locations.
  - 3. For corrosive atmospheres or other extreme environmental conditions, use fasteners made of materials suitable for the conditions.
  - 4. Fasteners in process areas or areas subject to corrosive fumes or process liquids shall be PVC coated.
- B. Types and Use: Unless otherwise specified or indicated use:
  - 1. Cast-in-place concrete inserts in fresh concrete construction for direct pull-out loads such as shelf angles or fabricated metal items and supports attached to concrete slab ceilings.
  - 2. Anchoring devices to fasten items to solid masonry and concrete when the anchor is not subjected to pull out loads, or vibration in shear loads.
  - 3. Toggle bolts to fasten items to hollow masonry and stud partitions.
  - 4. TPR fasteners to fasten items to plywood backed gypsum board ceilings.

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5. Metallic fasteners installed with electrically operated or powder driven tools for approved applications, except:
  - a. Do not use powder driven drive pins or expansion nails.
  - b. Do not attach powder driven or welded studs to structural steel less than 3/16 inch thick.
  - c. Do not support a load, in excess of 250 lbs from any single welded or powder driven stud.
  - d. Do not use powder driven fasteners in precast concrete.

3.03 ATTACHMENT SCHEDULE

- A. General: Make attachments to structural steel or steel bar joists wherever possible. Provide intermediate structural steel members where required by support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of 5.
  1. Make attachments to steel bar joists at panel points of joists.
  2. Do not drill holes in main structural steel members.
  3. Use "C" beam clamps for attachment to steel beams.
- B. Where it is not possible to make attachments to structural steel or steel bar joists, use the following methods of attachment to suit type of construction unless otherwise specified or indicated on the drawings:
  1. Attachment to Steel Roof Decking (No Concrete Fill):
    - a. Decking With Hanger Tabs: Use deck clamps.
    - b. Decking Without Hanger Tabs:
      - 1) Before Roofing Has Been Applied: Use 3/8 inch threaded steel rod welded to a 4 x 4 x 1/4 inch steel plate and installed through 1/2 inch hole in roof deck.
      - 2) After Roofing Has Been Applied: Use welding studs, or self-drilling/tapping fasteners. Exercise extreme care when installing fasteners to avoid damage to roofing.
  2. Attachment to Concrete Filled Steel Decks (Total thickness, 2-1/2 inches or more):
    - a. Before Fill Has Been Placed:
      - 1) Use thru-bolts and fish plates.
      - 2) Use welded studs. Do not support a load in excess of 250 pounds from a single welded stud.
    - b. After Fill Has Been Placed: Use welded studs. Do not support a load in excess of 250 lbs from a single welded stud.
  3. Attachment to Cast-In-Place Concrete:
    - a. Fresh Concrete: Use cast-in-place concrete inserts.
    - b. Existing Concrete: Use anchoring devices.
  4. Attachment to Cored Precast Concrete Decks:
    - a. New Construction: Use thru-bolts and fish plates before Construction Work Contractor has placed roofing insulation over the decks. Contractor shall not drill into or power fasten to bottom of precast plank.
  5. Attachment to Hollow Block or Tile Filled Concrete Deck:
    - a. New Construction: Use cast-in-place concrete inserts by having Construction Work Contractor omitting blocks and pouring solid blocks with insert where

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- required.
6. Attachment to Waffle Type Concrete Decks:
    - a. New Construction:
      - 1) Use cast-in-place concrete inserts in fresh concrete.
      - 2) If concrete fill has been applied over deck, thru-bolts and fish plates may be used where additional concrete or roofing is to be placed over the deck.
  7. Attachment to Precast Concrete Planks: Use anchoring devices, except do not make attachments to precast concrete planks less than 2-3/4 inches thick.
  8. Attachment to Precast Concrete Tee Construction:
    - a. New Construction:
      - 1) Use tee hanger inserts between adjacent flanges.
      - 2) Use thru-bolts and fish plates, except at roof deck without concrete fill.
    - b. Existing Construction:
      - 1) Use anchoring devices installed in webs of tees. Install anchoring devices as high as possible in the webs.
    - c. Do not use powder driven fasteners.
    - d. Exercise extreme care in drilling holes to avoid damage to reinforcement.
  9. Attachment to Wood Construction: Use side beam brackets fastened to the sides of wood members to make attachments for hangers.
    - a. Under 15 lbs Load: Attach side beam brackets to wood members with 2 No. 18 x 1-1/2 inch long wood screws, or 2 No. 16 x 1-1/2 inch long drive screws.
    - b. Over 15 lbs Load: Attach side beam brackets to wood members with bolts and nuts or lag bolts. Do not use lag bolts in wooden members having a nominal thickness (beam face) under 2 inches in size. Install bolts and nuts or lag bolts in the side of wood members at the mid-point or slightly above. Install plain washers under all nuts.

LOAD	LAG BOLT SIZE	BOLT DIA.
15 lbs to 30 lbs	3/8 x 1-3/4 inches	3/8 inch
31 lbs to 50 lbs	1/2 x 2 inches	1/2 inch
Over 50 lbs to load limit of structure.	Use bolt & nut	5/8 inch

- c. Bottom chord of wood trusses may be utilized as structural support, but method of attachment must be specifically approved.
  - d. Do not make attachments to the diagonal or vertical members of wood trusses.
  - e. Do not make attachments to the nailing strips on top of steel beams.
10. Attachment to Metal Stud Construction: Use supporting fasteners manufactured specifically for the attachment of raceways and boxes to metal stud construction.
  - a. Support and attach outlet boxes so that they cannot torque/twist. Either:
    - 1) Use bar hanger assembly, or:
    - 2) In addition to attachment to the stud, also provide far side box support.

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3.04 CONDUIT SUPPORT SCHEDULE

- A. Provide number of supports as required by National Electrical Code.
- B. Use pipe straps and specified method of attachment where conduit is installed proximate to surface of wood or masonry construction.
  - 1. Use hangers secured to surface with specified method of attachment where conduit is suspended from the surface.
- C. Use "C" beam clamps and hangers where conduit is supported from steel beams.
- D. Use deck clamps and hangers where conduit is supported from steel decking having hanger tabs.
  - 1. Where conduit is supported from steel decking which does not have hanger tabs, use clamps and hangers secured to decking, utilizing specified method of attachment.
- E. Use channel support system supported from structural steel for multiple parallel conduit runs.
- F. Where conduits are installed above ceiling, do not rest conduit directly on runner bars, T-Bars, etc.
  - 1. Conduit Sizes 2-1/2 Inches and Smaller: Support conduit from ceiling supports or from construction above ceiling.
  - 2. Conduit Sizes Over 2-1/2 Inches: Support conduit from beams, joists, or trusses above ceiling.

3.05 LIGHTING FIXTURE SUPPORT SCHEDULE

- A. General: Do not support fixtures from ceilings or ceiling supports unless it is specified or indicated on the drawings to do so.
  - 1. Support fixtures with hanger rods attached to beams, joists, or trusses. Hanger rod diameter, largest standard size that will fit in mounting holes of fixture.
    - a. Where approved, channel supports may span and rest upon the lower chord of trusses and be utilized for the support of lighting fixtures.
    - b. Where approved, channel supports may span and be attached to the underside of beams, joists, or trusses and be utilized for the support of lighting fixtures.
  - 2. Use 2 nuts and 2 washers on lower end of each hanger rod to hold and adjust fixture (one nut and washer above top of fixture housing, one nut and washer below top of fixture housing).
    - a. Where specified that an adequately supported outlet box is to support a fixture or be utilized as one point of support, support the box so that it may be adjusted to bring the face of the outlet box even with surface of ceiling.
- B. Specific Installations Where Fixtures May Be Supported From New Ceilings Being Installed By Construction Work Contractor:
  - 1. Support surface mounted fluorescent fixtures and incandescent fixtures directly from plywood backed gypsum board ceilings.



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2. Support surface mounted fluorescent fixtures and incandescent fixtures directly from framing or furring members of fire rated suspended ceilings (double gypsum board).
  3. Support recessed mounted fluorescent fixtures and incandescent fixtures directly from furring members of furred gypsum board ceilings.
  4. Support recessed mounted fluorescent fixtures and incandescent fixtures directly from the suspension system of suspended acoustical ceilings. Exception: Support each fixture weighing more than 50 pounds (including lamps) independent of the suspended ceiling grid.
  5. Deliver documents which state actual fixture weights and indicate fixture locations to the Construction Work Contractor (thru the Owner's Representative).
- C. Number of Supports For Ceiling Mounted Lighting Fixtures: Provide at least the following number of supports. Provide additional supports when recommended by fixture manufacturer or shown on the drawings.
1. Commercial and Industrial Fluorescent Fixtures:
    - a. Support individual fluorescent fixtures less than 2 feet wide at 2 points.
    - b. Support continuous row fluorescent fixtures less than 2 feet wide at points equal to the number of fixtures plus one. Uniformly distribute the points of support over the row of fixtures.
    - c. Support individual fluorescent fixtures 2 feet or wider at 4 corners.
    - d. Support continuous row fluorescent fixtures 2 feet or wider at points equal to twice the number of fixtures plus 2. Uniformly distribute the points of support over the row of fixtures.
    - e. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.
  2. Vandal Resistant, and Minimum Security Fluorescent Fixtures:
    - a. Support individual fluorescent fixtures less than 2 feet wide at 4 corners.
    - b. Support continuous row fluorescent fixtures less than 2 feet wide at points equal to twice the number of fixtures. Uniformly distribute the points of support.
    - c. Support individual fluorescent fixtures 2 feet or wider at each corner and one support midway along each side of longest axis (6 supports total).
    - d. Support continuous row fluorescent fixtures 2 feet or wider at points equal to 4 times the number of fixtures. Uniformly distribute the points of support.
    - e. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.
  3. Medium Security Fluorescent Fixtures: Support each fixture at minimum of 6 points (each corner and midway along each side of longest axis). Outlet box shall not be counted as a point of support.
  4. Maximum Security Fluorescent Fixtures: Support each fixture at minimum of 8 points (each corner, and 2 supports spaced equally along each side of longest axis). Outlet box shall not be counted as a point of support.
  5. Mercury Vapor, Metal Halide, and High-Pressure Sodium Fixtures:
    - a. Commercial Style: Support fixture at 2 points.
    - b. Industrial Style: Support individual fixtures at one point.
    - c. Vandal Resistant Style: Support fixture at 4 points.
    - d. An adequately supported outlet box may be utilized as one point of support

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- for fixtures weighing less than 50 pounds.
6. Commercial and Industrial Incandescent Fixtures: Support fixture from adequately supported outlet box, to suit fixture design (fixture weight less than 50 pounds).
  7. Vandal Resistant Incandescent Fixtures: Support fixture from adequately supported outlet box to suit fixture design, plus 2 fasteners through back of fixture into suitable construction behind fixture.
- D. Number of Supports For Wall Mounted Lighting Fixtures: Provide at least the following number of supports. Provide additional supports when recommended by fixture manufacturer or shown on the drawings.
1. Commercial and Industrial Fluorescent Fixtures:
    - a. Support individual fluorescent fixtures 2 feet long or less at 2 points.
    - b. Support individual fluorescent fixtures over 2 feet long at 3 points.
    - c. Support continuous row fluorescent fixtures at points equal to twice the number of fixtures. Uniformly distribute the points of support.
    - d. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.
  2. Vandal Resistant, and Minimum Security Fluorescent Fixtures:
    - a. Support individual fluorescent fixtures 2 feet long or less at 4 points (each corner).
    - b. Support individual fluorescent fixtures over 2 feet long at 6 points (each corner and midway along each side of longest axis).
    - c. Support continuous row fluorescent fixtures at points equal to 6 times the number of fixtures. Uniformly distribute the points of support.
    - d. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.
  3. Medium Security, and Maximum Security Fluorescent Fixtures:
    - a. Support each fluorescent fixture 2 feet long or less at minimum of 4 points (each corner).
    - b. Support each fluorescent fixture over 2 feet long, to 3 feet long at a minimum of 6 points (each corner and midway along each side of longest axis).
    - c. Support each fluorescent fixture over 3 feet long, to 8 foot long at minimum of 8 points (each corner, and 2 supports spaced equally along each side of longest axis).
    - d. Outlet box shall not be counted as a point of support.
  4. Metal Halide, and High-Pressure Sodium Fixtures:
    - a. Commercial and Industrial Style: Support fixture at 2 points (Support arm mounted style at 4 points).
    - b. An adequately supported outlet box may be used as one point of support for fixtures weighing less than 50 pounds.
  5. Commercial and Industrial Incandescent Fixtures: Support fixture from adequately supported outlet box, to suit fixture design (fixture weight less than 50 pounds).

3.06 CHANNEL SUPPORT SYSTEM SCHEDULE

- A. Use channel support system where specified or indicated on the drawings.

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- B. Channel supports may be used, as approved, to accommodate mounting of equipment.
- C. Material and Finish:
  - 1. Dry Locations: Use 12 gage steel channel support system having any one of the specified finishes.
  - 2. Damp Locations: Use 12 gage steel channel support system having any one of the specified finishes except green epoxy/enamel.
  - 3. Wet Locations: Use 12 gage steel channel support system having hot dipped galvanized, or PVC finish.

END OF SECTION

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PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, ANSI, and UL.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

1.03 MAINTENANCE

- A. Spare Parts: Furnish the following items in the manufacturer's original containers labeled with the names of the items and locations where the items would be used. Store them at the site where directed:
  - 1. Touch up coating compound for plastic coated rigid metal conduit (one spray type can and one non-spray can with brush top).

PART 2 PRODUCTS

2.01 RACEWAYS

- A. Rigid Ferrous Metal Conduit: Steel, hot dipped galvanized on the outside and inside, UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel or Rigid Steel Conduit), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
- B. Intermediate Ferrous Metal Conduit: Steel, galvanized on the outside and enameled on the inside, UL categorized as Intermediate Ferrous Metal Conduit (identified on UL Listing Mark as Intermediate Metal Conduit or IMC), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
- C. Electrical Metallic Tubing: Steel, galvanized on the outside and enameled on the inside, UL categorized as Electrical Metallic Tubing (identified on UL Listing Mark as Electrical Metallic Tubing), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
- D. Flexible Metal Conduit: Galvanized steel strip shaped into interlocking convolutions, UL categorized as Flexible Metal Conduit (identified on UL Listing Mark as Flexible Steel Conduit or Flexible Steel Conduit Type RW), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or International Metal Hose Co.
- E. Liquid-tight Flexible Metal Conduit: UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co.
- F. Surface Metal Raceway, Fittings and Accessories: By Thomas & Betts Corp., Mono-Systems Inc. or Wiremold Co. Area and conductor capacity indicated for each size

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raceway is for reference. Follow manufacturer's recommended raceway capacity for all types and sizes of conductors:

1. Size 1: Nominal area .3 sq. in. min., 4 No. 12 THW max.; Thomas & Betts B400, Mono-Systems SMS 700, or Wiremold's V700.
2. Size 2: Nominal area .75 sq. in. min., 11 No. 12 THW max.; Thomas & Betts SR250, Mono-Systems SMS2100, Wiremold's 2100.
3. Size 3: Nominal area 2.8 sq. in. min., 43 No. 12 THW max.; Thomas & Betts SR500, Mono-Systems SMS3200, or Wiremold's G3000.
4. Size 4: Nominal area 7.5 sq. in. min., 119 No. 12 THW max.; Thomas & Betts SR600, Mono-Systems SMS4200, or Wiremold's G4000.
5. Size 5: Nominal area 15.9 sq. in. min., 252 No. 12 THW max.; Thomas & Betts SR700, Mono-Systems SMS4400, or Wiremold's G6000.

G. Wireways, Fittings and Accessories:

1. NEMA 1 (Without Knockouts): Hoffman Enclosures Inc. Bulletin F-40, Hubbell/Wegmann's HSK, Lee Products Co.'s S Series, Rittal/Electromate's EW & EWHC Lay-In Wireway System, or Square D Co.'s Square-Duct Class 5100.

H. Plastic Coated Rigid Metal Conduit, Fittings, and Accessories: Rigid ferrous metal conduit, fittings, and accessories coated with 40 mils thick polyvinylchloride coating; Ocal/T&B Corp.'s Ocal-Blue System, PCD Inc.'s KorKap, KorKap XL, or Robroy Industries' Plasti-bond or Perma-Cote System.

2.02 FITTINGS AND ACCESSORIES

A. Insulated Bushings:

1. Threaded, malleable iron/zinc electroplate with 105 degrees C minimum plastic insulated throat; Appleton Electric Co.'s BU50I Series, Cooper/Crouse-Hinds' 1031 Series, OZ/Gedney Co.'s IBC-50 Series, Racor Inc.'s 1132 Series, Steel City/T & B Corp.'s BI-901 Series, or Thomas & Betts Corp.'s 1222 Series.
2. Threaded malleable iron with 150 degrees C plastic throat; Appleton Electric Co.'s BU501 Series, Cooper/Crouse-Hinds' H1031 Series, or OZ/Gedney Co.'s IBC-50 Series.

B. Plastic Bushings for 1/2 and 3/4 Inch Conduit:

1. 105 degrees C minimum temperature rating; Appleton Electric Co.'s BBU50, BBU75, Blackburn (T & B Corp.'s) 50 BB, 75 BB, Cooper/Crouse-Hinds' 931, 932, or OZ/Gedney Co.'s IB-50, IB-75, Racor Inc.'s 1402, 1403, Steel City/T & B Corp.'s BU-501, BU-502, or Thomas & Betts Corp.'s 222, 223.
2. 150 degrees C temperature rating; Appleton Electric Co.'s BBU50H, BBU75H, Cooper/Crouse-Hinds' H-931, H-932, or OZ/Gedney Co.'s A-50, A-75.

C. Insulated Grounding Bushings:

1. Threaded, malleable iron/zinc electroplate with 105 degrees C minimum plastic insulated liner, and ground lug; Appleton Electric Co.'s GIB-50 Series, Cooper/Crouse-Hinds' GLL Series, OZ/Gedney Co.'s IBC-50L Series, Racor Inc.'s 1212 Series, Steel City/T & B Corp.'s BG-801 (1/2 to 2") Series, or Thomas & Betts Corp.'s 3870.

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2. Threaded malleable iron/zinc electroplate with 150 degrees C plastic insulated liner, and ground lug; Appleton Electric Co.'s GIB Series, Cooper/Crouse-Hinds' HGLL Series, or OZ/Gedney Co.'s IBC-50L Series, or Thomas & Betts Corp.'s 3870.
- D. Connectors and Couplings:
1. Locknuts: UL, steel/zinc electroplate; Appleton Electric Co.'s BL-50 Series, Cooper/Crouse-Hinds' 11 Series, OZ/Gedney Co.'s 1-50S Series, Racor Inc.'s 1002 Series, Steel City/T&B Corp.'s LN-101 Series, or Thomas & Betts Corp.'s 141 Series.
  2. Grounding Wedge: Thomas & Betts Corp.'s 3650 Series.
  3. Couplings For Rigid Metal and IMC Conduit: Standard galvanized threaded couplings as furnished by conduit manufacturer, Allied Tube & Conduit Corp.'s Kwik-Couple, or Thomas & Betts Corp.'s Shamrock.
  4. Three Piece Conduit Coupling For Rigid Metal and IMC Conduit: Steel, malleable iron, zinc electroplate; Allied Tube & Conduit Corp.'s Kwik-Couple, Appleton Electric Co.'s EC-50 Series, Cooper/Crouse-Hinds' 190M Series, OZ/Gedney Co.'s 4-50 Series, Racor Inc.'s 1502 Series, Steel City/T & B Corp.'s EK-401 Series, or Thomas & Betts Corp.'s 675 Series.
  5. Electrical Metallic Tubing Couplings and Insulated Connectors: Compression type, steel/zinc electroplate; Appleton Electric Co.'s TW-50CS1, TWC-50CS Series, Cooper/Crouse-Hinds' 1650, 660S Series, Racor Inc.'s 2912, 2922 Series, Steel City/T & B Corp.'s TC-711 Series, or Thomas & Betts Corp.'s 5120, 5123 Series.
  6. Flexible Metal Conduit Connectors: Arlington Industries Inc.'s Saddle-Grip, OZ/Gedney Co.'s C-8T, 24-34T, ACV-50T Series, or Thomas & Betts Corp.'s Nylon Insulated Tite-Bite Series.
  7. Liquid-tight Flexible Metal Conduit Connectors: Steel, malleable iron, zinc electroplate, insulated throat; Appleton Electric Co.'s STB Series, Cooper/Crouse-Hinds' LTB Series, OZ/Gedney Co.'s 4Q-50T Series, Racor Inc.'s 3512 Series, Steel City/T & B Corp.'s LT-701 Series, or Thomas & Betts Corp.'s 5332 Series.
- E. Conduit Bodies (Threaded):
1. Malleable Iron/Zinc Electroplate: Zinc electroplate malleable iron or cast-iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies.
- F. Expansion Fittings:
1. Malleable Iron, Zinc Electroplate Finish: Appleton Electric Co.'s XJ or OZ/Gedney Co.'s AX (TX for EMT), with external bonding jumper.
  2. Electro-galvanized Steel: Cooper/Crouse-Hinds' XJG (XJG-EMT for EMT), or Thomas & Betts Corp.'s XJG, with internal grounding.
- G. Deflection Fittings: Appleton Electric Co.'s DF, Cooper/Crouse-Hinds' XD, or OZ/Gedney Co.'s Type DX.
- H. Hazardous Location Fittings:
1. Sealing Fittings: Appleton Electric Co.'s EYS, ESU w/Kwikol sealing compound and fiber filler, Cooper/Crouse-Hinds' EYS, EZS w/Chico A sealing compound

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- and Chico X filler, OZ/Gedney Co.'s EY, EYA with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. EYS w/Chico A sealing compound and Chico X filler.
2. Other Type Fittings: As required to suit installation requirements, by Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co, or Thomas & Betts Corp.
- I. Sealant for Raceways Exposed to Different Temperatures: Sealing compounds and accessories to suit installation; Appleton Electric Co.'s DUC, or Kwiko Sealing Compound with fiber filler, Cooper/Crouse-Hinds' Chico A Sealing Compound with Chico X fiber, Electrical Products Division 3M Scotch products, OZ Gedney Co.'s DUX or EYC sealing compound with EYF damming fiber, or Thomas & Betts Corp.'s Blackburn DX.
- J. Vertical Conductor Supports: Kellems/Hubbell Inc.'s Conduit Riser Grips, or OZ/Gedney Co.'s Type M, Type R.
- K. Pulling-In-Line For Installation in Spare and Empty Raceways: Polypropylene monofilament utility line; Greenlee Textron Inc.'s Poly Line 430, 431, or Ideal Industries Powr-Fish Pull-Line 31-340 Series.

PART 3 EXECUTION

3.01 RACEWAY INSTALLATION - GENERAL

- A. Number of Raceways: Do not change number of raceways to less than the number indicated on the drawings.
1. Each raceway shall enclose one circuit unless otherwise indicated on the drawings.
- B. Number of Raceways: Do not change number of raceways to less than the number indicated on the drawings except when appropriate for advantageous reuse of existing exposed and concealed raceways (the contract documents do not indicate location, number, size or condition of existing raceways). Existing raceways may be reused if the following conditions are met:
1. The existing raceway must be of adequate size for the new conductors to be installed therein (NFPA 70 Chapter 9, Tables 1, 4, & 5; Appendix C, Tables C1-C12a). More circuits may be enclosed by existing raceways than the circuiting shown on the drawings provided conductor sizes are increased to compensate for derating (adjustment factors) and other considerations required by NFPA 70 Article 310-15.
2. Remove existing conductors.
3. Demonstrate to the Owner's Representative that the existing raceway is clear of obstructions and in good condition.
4. Check ground continuity. When ground continuity of existing raceway is inadequate install insulated grounding bushings, grounding wedges, bonding straps, grounding jumpers or equipment grounding conductors to establish effective path to ground.
5. Install insulated bushings to replace damaged or missing bushings. Replace non-insulated bushings with insulated bushings on raceway sizes 1 inch and larger.

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6. Install vertical conductor supports to replace existing or missing vertical conductor supports.
  7. Install extension rings on existing boxes when the number of new conductors installed therein exceeds NFPA 70 requirements.
  8. Furnish the Owner's Representative with marked up drawings showing size and routing of existing raceways with number and size of new conductors installed therein.
- C. Raceways for Future Use (Spare Raceways and Empty Raceways): Draw fish tape through raceways in the presence of the Owner's Representative to show that the raceway is clear of obstructions.
1. Leave a pulling-in line in each spare and empty raceway.
- D. Conduit Installed Concealed:
1. Where possible install conduit concealed unless otherwise indicated on the drawings.
  2. Existing Construction:
    - a. Run conduit in existing chases and hung ceilings.
    - b. If conduit cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.
  3. New Construction:
    - a. Run conduit in the ceilings, walls, and partitions.
    - b. Install conduit under slabs on grade or under slabs above finished ceilings where indicated on the drawings. Concrete slabs that are both ceilings and floors shall be treated as floor slabs.
      - 1) Conduit Under Slab on Grade:
        - a) Run conduit under vapor barrier, if any.
        - b) Install equipment grounding conductor in each conduit. Bond at boxes and equipment to which conduit is connected.
      - 2) Conduit Under Slab, Above Finished Ceiling:
        - a) Attach conduit to bottom of slab or structure supporting the slab.
        - b) Firestop through-penetrations of the slab.
  4. If any portions of the conduit system cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.
- E. Conduits Penetrating Concrete Floor Slabs (Concrete slabs that are both ceilings and floors shall be treated as floor slabs):
1. Provide a minimum of 2 inches between conduits that vertically penetrate elevated concrete slabs.
- F. Conduit Installed Exposed:
1. Install conduit exposed where indicated on the drawings.
  2. Install conduit tight to the surface of the building construction unless otherwise indicated or directed.
  3. Install vertical runs perpendicular to the floor.
  4. Install runs on the ceiling perpendicular or parallel to the walls.
  5. Install horizontal runs parallel to the floor.



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6. Do not run conduits near heating pipes.
  7. Installation of conduit directly on the floor will not be permitted.
- F. Conduit Size: Not smaller than 1/2 inch electrical trade size. Where type FEP, THHN, THWN, THWN-2, XHH, XHHW, or XHHW-2 conductors are specified for use under Section 16121, the minimum allowable conduit size for new Work shall be based on Type THW conductors.
- G. Conduit Bends: For 1/2 and 3/4 inch conduits, bends may be made with manual benders. For all conduit sizes larger than 3/4 inch, manufactured or field fabricated offsets or bends may be used. Make field fabricated offsets or bends with an approved hydraulic bender.

3.02 RACEWAY INSTALLATION - SPECIAL AREAS

- A. Conduit in Hazardous Areas: Install Work in hazardous areas in accordance with the NFPA 70. The hazardous areas and the degree of hazard for each area are indicated on the drawings.
1. Install sealing fittings in concealed conduit runs in a recessed box with blank face plate to match other face plates in the area.

3.03 RACEWAY SCHEDULE

- A. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
- B. Intermediate Ferrous Metal Conduit: May be installed in all dry and damp locations except:
1. Hazardous areas.
  2. Where other type raceways are specified or indicated on the drawings.
- C. Electrical Metallic Tubing:
1. May be installed concealed as branch circuit conduits above suspended ceilings where conduit does not support fixtures or other equipment.
  2. May be installed concealed as branch circuit conduits in hollow areas in dry locations, including:
    - a. Hollow concrete masonry units, except where cores are to be filled.
    - b. Drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.
- D. Flexible Metal Conduit: Install equipment grounding conductor in the flexible metal conduit and bond at each box or equipment to which conduit is connected:
1. Use for final conduit connection to recessed lighting fixtures in suspended ceilings. Use 4 to 6 feet of flexible metal conduit, minimum size 1/2 inch, between junction box and fixture. Locate junction box at least 1 foot from fixture and accessible if the fixture is removed.
  2. Use 1 to 3 feet of flexible metal conduit for final conduit connection to:
    - a. Dry type transformers.
    - b. Non-Process Equipment subject to vibration (dry locations).

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- c. Non-Process Equipment requiring flexible connection for adjustment or alignment (dry locations).
  - 3. Use for concealed branch circuit conduits above existing non-removable suspended ceilings where rigid type raceways cannot be installed due to inaccessibility of space above ceiling.
  - 4. May be installed concealed as branch circuit conduits in drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.
- E. Liquid-tight Flexible Metal Conduit: Install equipment grounding conductor in liquid-tight flexible metal conduit and bond at each box or equipment to which conduit is connected:
  - 1. Use 1 to 3 feet of liquid-tight flexible metal conduit (UL listed and marked suitable for the installation's temperature and environmental conditions) for final conduit connection to:
    - a. Motors with weather-protected or totally enclosed housings.
    - b. Equipment subject to vibration (damp and wet locations).
    - c. Equipment requiring flexible connection for adjustment or alignment (damp and wet locations).
- F. Surface Metal Raceway: Use as exposed raceway system in finished spaces at locations indicated on the drawings.
  - 1. Use surface metal raceway system of size required for number of wires to be installed therein. Use specific size when indicated on the drawings.
  - 2. Do not run raceway through walls that have a plaster finish nor through masonry walls or floors. Install a pipe sleeve, or a short length of conduit with junction boxes or adapter fittings for raceway runs through such areas. Run raceway along top of baseboards, care being taken to avoid telephone and other signal wiring. Where raceway crosses chair railing or picture molding, cut the chair railing or picture molding to permit the raceway to lie flat against the wall. Run raceway around door frames and other openings. Run raceway on ceiling or walls perpendicular to or parallel with walls and floors.
  - 3. Secure raceway at intervals not exceeding 36 inches.
  - 4. Install separate equipment grounding conductor for grounding of equipment. The raceway alone will not be considered suitable for use as an effective path to ground.
  - 5. Outlet box covers for pendant mounted fluorescent fixtures may be omitted if the fixture canopy is notched to receive the raceway and the canopy fits snugly against the ceiling.
  - 6. Where equipment is mounted on an outlet box and the equipment base is larger than the outlet box, provide finishing collar around equipment base and outlet box or provide finishing collar/outlet box:
    - a. Finishing Collar: Same finish and peripheral dimensions as the equipment base, including provisions for mounting, slots to fit over raceway and of depth to cover outlet box and extend back to ceiling or wall.
    - b. Combination Finishing Collar/Outlet Box: Same finish and peripheral dimensions as the equipment base to be mounted thereon, gage or thickness of metal as required by NFPA 70, including provision for mounting and knockouts for entrance of raceway.

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- G. Wireways: May be used indoors in dry locations for exposed raceway between grouped, wall mounted equipment.
- H. Plastic Coated Rigid Metal Conduit: Use at locations indicated on drawings.

3.04 FITTINGS AND ACCESSORIES SCHEDULE

- A. General:
  - 1. Use fittings and accessories that have a temperature rating equal to, or higher than the temperature rating of the conductors to be installed within the raceway.
  - 2. Use zinc electroplate or hot dipped galvanized steel/malleable iron or cast-iron alloy fittings and accessories in conjunction with ferrous raceways in dry and damp locations unless otherwise specified or indicated on the drawings.
  - 3. Use insulated grounding bushings or grounding wedges on ends of conduit for terminating and bonding equipment grounding conductors, when required, if cabinet or boxes are not equipped with grounding/bonding screws or lugs.
  - 4. Use caps or plugs to seal ends of conduits until wiring is installed to exclude foreign material.
  - 5. Use insulated grounding bushings on the ends of conduits that are not directly connected to the enclosure, such as stub-ups under equipment, etc., and bond between bushings and enclosure with equipment grounding conductor.
  - 6. Use expansion fittings where raceways cross expansion joints (exposed, concealed, buried).
  - 7. Use deflection fittings where raceways cross expansion joints that move in more than one plane.
  - 8. Use 2 locknuts and an insulated bushing on end of each conduit entering sheet metal cabinet or box in dry or damp locations.
    - a. Plastic bushing may be used on 1/2 and 3/4 inch conduit in lieu of insulated bushing.
    - b. Terminate conduit ends within cabinet/box at the same level.
- B. For Rigid and Intermediate Metal Conduit: Use threaded fittings and accessories. Use 3 piece conduit coupling where neither piece of conduit can be rotated.
- C. For Electrical Metallic Tubing: Use compression type connectors and couplings.
- D. For Flexible Metal Conduit: Use flexible metal conduit connectors.
- E. For Liquid-tight Flexible Metal Conduit: Use liquid-tight connectors.
- F. For Surface Metal Raceway: Use raceway manufacturer's standard fittings and accessories.
- G. For Wireways: Use wireway manufacturer's standard fittings and accessories.
- H. For Plastic Coated Rigid Metal Conduit: Use conduit manufacturer's PVC coated fittings and accessories.

END OF SECTION

SECTION 260534  
OUTLET, JUNCTION, AND PULL BOXES

PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, and UL.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.
  - 1. For fire rated construction, prove that materials and installation methods proposed for use are in accordance with the listing requirements of the classified construction.

PART 2 PRODUCTS

2.01 GALVANIZED STEEL OUTLET BOXES

- A. Standard galvanized steel boxes and device covers by Appleton Electric Co., Beck Mfg./Picoma Industries, Cooper/Crouse-Hinds, Raco/Div. of Hubbell, or Steel City/T & B Corp.

2.02 GALVANIZED STEEL JUNCTION AND PULL BOXES

- A. Code gage, galvanized steel screw cover boxes by Delta Metal Products Inc., Hoffman Enclosures Inc., Hubbell Wiegmann, Lee Products Co., or Rittal/Electromate.

2.03 THREADED TYPE BOXES:

- A. Outlet Boxes:
  - 1. For Dry, Damp Locations: Zinc electroplate malleable iron or cast-iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., or OZ/ Gedney Co., with zinc electroplate steel covers to suit application.
  - 2. For Wet Locations: Malleable iron or cast-iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish as produced by Cooper/Crouse-Hinds (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), with stainless steel cover screws, and malleable iron covers gasketed to suit application.
- B. Junction And Pull Boxes:
  - 1. For Dry, Damp Locations: Zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, or OZ/Gedney Co., with zinc electroplate steel or cast-iron cover.
  - 2. For Wet Locations: Cast iron boxes by Cooper/Crouse-Hinds' (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), with stainless steel cover screws and cast-iron cover gasketed to suit application.
- C. Conduit Bodies, Threaded (Provided with a Volume Marking):

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1. For Dry, Damp Location: Zinc electroplate malleable iron or cast-iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, or OZ/Gedney Co.'s Conduit Bodies.
2. For Wet Locations: Malleable iron or cast-iron alloy bodies with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (hot dipped galvanized or Corro-free epoxy power coat), or OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized) with stainless steel cover screws and malleable iron covers gasketed to suit application.

2.04 CORROSION RESISTANT BOXES

- A. Plastic Coated Outlet and Junction Boxes: Threaded type malleable iron boxes coated with 40 mils thick polyvinylchloride coating; Ocal/T&B Corp.'s Ocal-Blue System, PCD Inc.'s KorKap, KorKap XL, or Robroy Industries' Plastibond or Perma-Cote System.
- B. Non-Metallic Junction and Pullboxes: Glass fiber reinforced polyester; Carlon/Div. of Lamon and Sessions' Himeline Series, Cooper/Crouse-Hinds' Krydon Products, or Robroy Industries' Stahlin Enclosures.

2.05 SPECIFIC PURPOSE OUTLET BOXES

- A. As fabricated by manufacturers for mounting their equipment.

2.06 FINISHING COLLAR OR COMBINATION FINISHING COLLAR/OUTLET BOX  
(SURFACE MOUNTED EQUIPMENT USED WITH EXPOSED RACEWAY):

- A. Finishing Collar: Same finish and peripheral dimensions as the equipment base, including provisions for mounting, slots to fit over raceway and of depth to cover outlet box and extend back to ceiling or wall.
- B. Combination Finishing Collar/Outlet Box: Same finish and peripheral dimensions as the equipment base, gage or thickness of metal as required by National Electrical Code, including provisions for mounting, and knockouts or threaded bosses for entrance of raceway.

PART 3 EXECUTION

3.01 PREPARATION

- A. Before proceeding with the installation of junction and pull boxes, check the locations with the Owner's Representative and have same approved.

3.02 INSTALLATION

- A. Mounting Position of Wall Outlets For Wiring Devices: Unless otherwise indicated, install boxes so that the long axis of each wiring device will be vertical.
- B. Height of Wall Outlets: Unless otherwise indicated, locate outlet boxes with their center lines at the following elevations above finished floor:

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Lighting Fixtures	As Indicated on Drawings"
Lighting Fixtures in Stairway	As Indicated on Drawings"
Exit Lights	8'-0" where ceiling height allows a minimum of 6 inch clearance between ceiling and top of exit light. Otherwise mount exit light so that it's top is 6 inches below finished ceiling. Adjust height and clearances as required to suit installation over doors.
Switches	4'-0"
Single & Duplex Receptacles	1'-6"* or as indicated.
Water Cooler Receptacles	2'-0"
Range Receptacle	1'-6"
Special Purpose Receptacles	4'-0"
Thermostats	5'-0"
Manual Fire Alarm Boxes	4'-0"
Audible Notification Appliances	8'-0" where ceiling height allows a minimum of 6 inch clearance between ceiling and top of appliance. Otherwise mount appliance so that it's top is 6 inches below finished ceiling.
Visible Notification Appliances	Install outlet so that the bottom of the visible lens will be 6'-8" AFF.
Combination Audible/Visible Notification Appliances	Install outlet so that the bottom of the visual lens will be 6'-8" AFF, and the audible section will be above the visible section.
Telecommunications	2'-0"
Telephone	2'-0"

\*In areas containing heating convectors, install outlets above convectors at height indicated on drawings.

- C. Supplementary Junction and Pull Boxes: In addition to junction and pull boxes indicated on the drawings and required by NFPA 70, provide supplementary junction and pull boxes as follows:
1. When required to facilitate installation of wiring.
  2. At every third 90 degree turn in conjunction with raceway sizes over 1 inch.
  3. At intervals not exceeding 100 feet in conjunction with raceway sizes over 1 inch.

### 3.03 OUTLET, JUNCTION, AND PULL BOX SCHEDULE

- A. Boxes For Concealed Conduit System:
1. Non-Fire Rated Construction:
    - a. Depth: To suit job conditions and comply with NFPA 70 Article 370.
    - b. For Lighting Fixtures: Use galvanized steel outlet boxes designed for the purpose.
      - 1) For Fixtures Weighing 50 lbs. or Less: Box marked "FOR FIXTURE SUPPORT".
      - 2) For Fixtures More Than 50 lbs: Box listed and marked with the weight of the fixture to be supported (or support fixture independent of the box).

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- c. For Junction and Pull Boxes: Use galvanized steel boxes with flush covers.
  - d. For Switches, Receptacles, Etc:
    - 1) Plaster or Cast-In-Place Concrete Walls: Use 4 inch or 4-11/16 inch galvanized steel boxes with device covers.
    - 2) Walls Other Than Plaster or Cast-In-Place Concrete: Use type of galvanized steel box which will allow wall plate to cover the opening made for the installation of the box.
  - 2. Recessed Boxes in Fire Rated (2 hour maximum) Bearing and Nonbearing Wood or Steel Stud Walls (Gypsum Wallboard Facings):
    - a. Use listed single and double gang metallic outlet and switch boxes. The surface area of individual outlet or switch boxes shall not exceed 16 square inches.
    - b. The aggregate surface area of the boxes shall not exceed 100 square inches per 100 square feet of wall surface.
    - c. Securely fasten boxes to the studs. Verify that the opening in the wallboard facing is cut so that the clearance between the box and the wallboard does not exceed 1/8 inch.
    - d. Separate boxes located on opposite sides of walls or partitions by a minimum horizontal distance of 24 inches. This minimum separation distance may be reduced when wall opening protective materials are installed according to the requirements of their classification.
    - e. Use wall opening protective material in conjunction with boxes installed on opposite sides of walls or partitions of staggered stud construction in accordance with the classification requirements for the protective material.
  - 3. Other Fire Rated Construction: Use materials and methods to comply with the listing requirements for the classified construction.
- B. Boxes For Exposed Conduit System:
- 1. Dry and Damp Locations: Use zinc electroplate or hot dipped galvanized threaded type malleable iron or cast-iron alloy outlet, junction, and pullboxes or conduit bodies provided with a volume marking in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
    - a. Galvanized steel boxes may be used in conjunction with conduit sizes over 1 inch in non-hazardous dry and damp locations.
    - b. Galvanized steel boxes may be used in conjunction with electrical metallic tubing where it is allowed (specified) to be installed exposed as branch circuit conduits at elevations over 10'-0" above finished floor.
  - 2. Wet Locations: Use threaded type malleable iron or cast-iron alloy outlet junction, and pullboxes or conduit bodies (provided with a volume marking) with hot dipped galvanized or other specified corrosion resistant coating in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
    - a. Use corrosion resistant boxes in conjunction with plastic coated rigid ferrous metal conduit.
  - 3. Finishing Collar or Combination Finishing Collar/Outlet Box (Surface Mounted Equipment Used With Exposed Raceway):

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- a. Use finishing collar where surface mounted equipment is installed on an exposed raceway outlet box and the equipment base is larger than the outlet box.
  - b. Use combination finishing collar/outlet box where surface mounted equipment is not indicated to be installed on an exposed raceway outlet box, but raceway cannot be run directly into equipment body due to equipment design.
- C. Specific Purpose Outlet Boxes: Use to mount equipment when available and suitable for job conditions. Unless otherwise specified, use threaded type boxes with finish as specified for exposed conduit system, steel (painted) for surface metal raceway system and galvanized steel for recessed installations.

END OF SECTION



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OUTLET, JUNCTION, AND PULL BOXES

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SECTION 260534  
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, ANSI, and UL.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

1.03 MAINTENANCE

- A. Spare Parts: Furnish the following items in the manufacturer's original containers labeled with the names of the items and locations where the items would be used. Store them at the site where directed:
  - 1. Touch up coating compound for plastic coated rigid metal conduit (one spray type can and one non-spray can with brush top).

PART 2 PRODUCTS

2.01 RACEWAYS

- A. Rigid Ferrous Metal Conduit: Steel, hot dipped galvanized on the outside and inside UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel, or Rigid Steel Conduit), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
- B. Liquid-tight Flexible Metal Conduit: UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co.
- C. Plastic Coated Rigid Metal Conduit, Fittings, and Accessories: Rigid ferrous metal conduit, fittings and accessories coated with 40 mils thick polyvinylchloride coating; Ocal/T&B Corp.'s Ocal-Blue System, PCD Inc.'s KorKap, KorKap XL, or Robroy Industries' Plastibond or Perma-Cote System.

2.02 FITTINGS AND ACCESSORIES

- A. Connectors and Couplings:
  - 1. Couplings (For Rigid Metal Conduit): Standard threaded couplings as furnished by conduit manufacturer.
  - 2. Watertight Conduit Hubs: Cooper/Crouse Hinds' Myers Hubs (stainless steel), OZ/Gedney Co.'s Type CH-T (hot dipped galvanized finish).
  - 3. Liquid-tight Flexible Metal Conduit Connectors: OZ/Gedney Co.'s 4Q-TG Series (hot-dip/mechanically galvanized), or Thomas & Betts Corp.'s 3322 Series (PVC coated).

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- B. Conduit Bodies (Threaded): Malleable iron or cast-iron alloy bodies and covers with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (Corro-free epoxy powder coat), Thomas & Betts Corp.'s Conduit Bodies (hot dipped galvanized), or OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized). Stainless steel cover screws, covers gasketed to suit application.
- C. Expansion Fittings: Cooper/Crouse-Hinds XJG (Corro-free epoxy powder coat), OZ Gedney Co.'s AX, EXE (end type, hot dipped galvanized), or Thomas & Betts Corp.'s XJG (hot dipped galvanized).
- D. Deflection Fittings: Ductile iron couplings with hot dipped galvanized finish, neoprene sleeve, and stainless-steel bands, Appleton Electric Co.'s CF; or bronze couplings, neoprene sleeve, and stainless-steel bands, OZ/Gedney Co.'s Type DX.
- E. Sealing Fittings: Malleable iron body with hot dipped/mechanically galvanized finish, neoprene sleeve, and stainless-steel bands, Appleton electric Co.'s CF; or bronze couplings, neoprene sleeve, and stainless-steel bands, OZ/Gedney Co.'s Type DX.
  - 1. Horizontal: Cooper/Crouse-Hinds' EYS with Chico A sealing compound and Chico X filler, OZ/Gedney Co.'s EYD with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. EYS w/Chico A sealing compound and Chico X filler.
  - 2. Vertical (with Drain): Cooper/Crouse-Hinds with Chico A sealing compound and Chico X filler, OZ/Gedney Co.'s EY, EYA with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. w/Chico A sealing compound and Chico X filler.
  - 3. Other Type Fittings: As required to suit installation requirements, by Cooper/Crouse-Hinds, OZ/Gedney Co., or Thomas & Betts Corp. with hot dipped/mechanically galvanized finish or epoxy powder coat.
- F. Conduit Clamps and Back Spacers: Malleable iron, hot dipped/mechanically galvanized finish; Cooper/Crouse-Hinds' 510 and CB1 Series, OZ/Gedney Co.'s 14-G and 141G Series, or Thomas & Betts Corp.'s 1275 and 1350 Series.
- G. Drains and Breathers: Stainless steel; Appleton Electric Co.'s ECBD, Cooper/Crouse-Hinds' ECD, OZ/Gedney Co.'s Type DB, or Thomas & Betts Corp.'s Type ECD.

### PART 3 EXECUTION

#### 3.01 RACEWAY INSTALLATION - GENERAL

- A. Number of Raceways: Do not change number of raceways to less than the number indicated on the drawings.
  - 1. Each raceway shall enclose one circuit unless otherwise indicated on the drawings.
- B. Conduit Size: Not smaller than 1/2 inch electrical trade size. Where type THWN, THWN-2, XHHW, or XHHW-2 conductors are specified for use under Section 16121,

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CONDUIT FOR ELECTRICAL SYSTEMS

the minimum allowable conduit size for new Work shall be based on Type THW conductors.

- C. Conduit Bends: For 1/2 and 3/4 inch conduits, bends may be made with manual benders. For all conduit sizes larger than 3/4 inch, manufactured or field fabricated offsets or bends may be used. Make field fabricated offsets or bends with an approved hydraulic bender.
- D. Conduit Exposed In Indoor Wet Locations: Install entire wiring system including conduit, boxes, and fittings so that there is a 1/4 inch air space between it and the wall or supporting surface.
- E. Conduit in Hazardous Areas: Install Work in hazardous areas in accordance with NFPA 70. The hazardous areas and the degree of hazard for each area are indicated on the drawings.

3.02 RACEWAY SCHEDULE - TYPES & USE

- A. Rigid Ferrous Metal Conduit: Install in all wet locations unless otherwise specified or indicated on the drawings.
- B. Liquid-tight Flexible Metal Conduit: Install equipment grounding conductor in liquid-tight flexible metal conduit and bond at each box or equipment to which conduit is connected:
  - 1. Use 1 to 3 feet of liquid-tight flexible metal conduit (UL listed and marked for the installation's temperature and environmental conditions) for final conduit connection to:
    - a. Motors with weather-protected or totally enclosed housings.
    - b. Equipment subject to vibration.
    - c. Equipment requiring flexible connection for adjustment or alignment.
- C. Plastic Coated Rigid Metal Conduit: Use in all process areas.

3.03 FITTINGS AND ACCESSORIES SCHEDULE

- A. General:
  - 1. Use malleable iron or cast-iron alloy fittings and accessories having hot dipped/mechanically galvanized finish or other specified corrosion resistant finish in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
  - 2. Use caps or plugs to seal ends of conduits until wiring is installed (to exclude foreign material).
  - 3. Use expansion fittings:
    - a. Where raceways cross expansion joints.
    - b. At intervals not exceeding 75 feet in straight runs (outside installations).
    - c. Between fixed equipment (outside installations).
  - 4. Use deflection fittings where raceways cross expansion joints that move in more than one plane.

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CONDUIT FOR ELECTRICAL SYSTEMS

5. Use watertight hub on end of each conduit entering cabinets or boxes that are not constructed with integral threaded hubs.
  6. Use back spacers behind each conduit clamp to keep raceway off surface to which it is attached and arranged to allow raceway to move due to expansion and contraction (outside installations).
  7. Use drains in low points of the system to drain condensation, keeping interior of raceway system free of moisture. Also use breather at high point of the system for outside installations.
- B. For Rigid Metal Conduit: Use threaded fittings.
- C. For Liquid-tight Flexible Metal Conduit: Use liquid-tight connectors.
- D. For Plastic Coated Rigid Metal Conduit: Use conduit manufacturer's PVC coated fittings and accessories.

END OF SECTION

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UNDERGROUND CONDUIT, DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Earthwork: Section 310000.
- B. Cast-In-Place Concrete: Section 033000.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Rigid Ferrous Metal Conduit: Steel, galvanized on the outside and inside (conduit enameled on the inside will not be accepted), UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit-Steel or Rigid Steel Conduit), as manufactured by Allied Tube & Conduit Corp., LTV Steel Tubular Products Co., Triangle Wire & Cable Inc., or Wheatland Tube Co.
- B. Rigid Nonmetallic Conduit And Fittings (Concrete Encased): Cantex, Inc.'s Schedule 40, Carlon Electrical Products Inc.'s Plus 40, CertainTeed Corp.'s Schedule 40, Omni/Opti-Com Manufacturing Network, Inc.'s Schedule 40 or Queen City Plastic Inc.'s Schedule 40.
- C. Plastic Coated Rigid Metal Conduit, Fittings and Accessories: Rigid ferrous metal conduit, fittings and accessories coated with 40 mils thick polyvinylchloride coating; Occidental Coating Co.'s Ocal 40, Protective Coatings Developments Inc.'s Kor-Kap, or Robroy Industries' Plastibond System.
- D. Conduit Spacers and Levelers: Commercially manufactured type to suit conduit, installation and spacing requirements.
- E. Duct Seal: Appleton Electric Co.'s DUC Weatherproof Compound, Manville Corp.'s Duxseal, OZ/Gedney Co.'s DUX, or Thomas & Betts Corp.'s DX.
- F. Drag Line: Minimum 1/8 inch polypropylene monofilament utility rope; American Synthetic Ropes' Flotorope, Greenlee Tool Co.'s 2 ply Rope 431, or Thomas Industries/Jet Line Products' Rope 232.
- G. Thru Wall Sealing Bushings:
  - 1. For Walls Which Have or Will Have Membrane Waterproofing:
    - a. Cast-In-Place Installations: OZ/Gedney Co.'s Type FSK thruwall seal and Type FSKA membrane clamp adapter.
    - b. Core Drilled or Sleeved Installations: OZ/Gedney Co.'s Type CSM and Type CSMC with membrane clamp adapter.
  - 2. For Walls Which Will Not Have Membrane Waterproofing:

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- a. Cast-In-Place Installations: OZ/Gedney Co.'s Type FSK.
  - b. Core Drilled or Sleeved Installations: OZ/Gedney Co.'s Type CSM, or Thunderline Corp.'s Link-Seal.
- H. End Bells:
- 1. For Rigid Ferrous Metal Conduit: OZ/Gedney Co.'s Type TNS.
  - 2. For Rigid Nonmetallic Conduit: Conduit manufacturer's standard end bells.
- I. Insulated Grounding Bushings: Appleton Electric Co.'s GIB-50 Series, Crouse Hinds GLL Series, OZ/Gedney Co.'s IBC-50L Series, Raco Inc.'s 1212 Series, or Thomas & Betts Corp.'s 3870 or BG Series.

PART 3 EXECUTION

3.01 PREPARATION

- A. Before installing any Work, lay out the proposed course for the conduits, location of manholes, etc. and have same approved by the Owner's Representative.

3.02 INSTALLATION

- A. Spacing:
- 1. Arrangement for Power and Signal Service: Separate power system conduits from signal system conduits with minimum 6 inches thick concrete wall or 12 inches of earth.
  - 2. Conduit Bank: Separate individual conduits a minimum of 3 inches. Use spacers and levelers located no more than 8 feet apart.
- B. Depth:
- 1. Existing Grade To Remain: Unless otherwise indicated or directed, install conduit more than 18 inches below existing finished grade.
  - 2. Existing Grade To Be Altered: Unless otherwise indicated or directed, install conduit more than 18 inches below the existing grade where the finished grade is to be higher than the existing grade. Where the finished grade is to be lower than the existing grade, install conduit more than 18 inches below finished grade.
  - 3. Under Roads and Parking Lots:
    - a. Rigid Ferrous Metal Conduit: Unless otherwise indicated or directed, install rigid ferrous metal conduit more than 24 inches below top surface of roads and parking lots.
    - b. Rigid Nonmetallic Conduit (Concrete Encased): Unless otherwise indicated or directed, install concrete encased rigid nonmetallic conduit more than 30 inches below top surface of roads and parking lots.
  - 4. Crossing Obstructions: Use rigid ferrous metal conduit where top of conduit system is less than 18 inches below finished grade when crossing obstructions (heating tunnels, etc.).
  - 5. In Rock:
    - a. Unless otherwise indicated on the drawings install rigid ferrous metal conduit or concrete encased rigid nonmetallic conduit at depths previously specified.

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Backfill with suitable material in accordance with SECTION 02300 - EARTHWORK.

- b. Where conduit is indicated to be installed at lesser depths, use rigid ferrous metal conduit. Cover conduit with minimum 2 inches of concrete. In exposed rock area fill trench with concrete to surface level of rock. Where rock is not exposed, complete backfill in accordance with SECTION 02300 - EARTHWORK.
- C. Pitch:
1. Pitch conduit away from buildings.
  2. Pitch conduit toward manhole a minimum of 12 inches per 100 feet. On runs where it is impossible to maintain the grade all one way, grade from center so that conduits pitch both directions down toward manholes.
- D. Concrete Encasement for Rigid Non-Metallic Conduit Using Either of the Two Methods Indicated Below: (Concrete Encasement for Rigid Ferrous Metal Conduit is not Required):
1. Single Pour Method.
  2. Two Pour Method:
    - a. Lay rigid nonmetallic conduits on a continuous concrete footing not less than 3 inches thick and as wide as the encasement. Install footings straight and true both in line of run and transversely and finished with an even surface. Incorporate anchoring devices into the footing for use in tying down the conduits. Grade footings so that conduits maintain required pitch. Before installing spacers, levelers, and conduits, let concrete footings harden as required to prevent damage to the footings.
      - 1) Where conduits enter building or manhole wall, reinforce footings for 10 feet with No. 4 rods, 4 inches on center.
      - 2) Footings are not required for rigid ferrous metal conduit.
    - b. After rigid nonmetallic conduits have been laid on footing with spacers and levelers (located no more than 8 feet apart), tie conduits down to the footing, then surround the conduits by concrete not less than 2 inches thick on top and 2 inches on each side. Separate individual conduits a minimum of 3 inches so that each conduit is completely enveloped in concrete.
      - 1) Where conduits enter building or manhole walls, reinforce encasement for 10 feet with No. 4 rods, 4 inches on center.
      - 2) Encasement is not required for rigid ferrous metal conduit.
    - c. Form sides of the concrete encasement. Exception: Earth cuts will be permitted as the form where trenches are neatly excavated in stable soils.
- E. Jacking Conduits: Rigid ferrous metal conduit may be jacked under roads, parking lots, etc. Submit jacking details for approval.
- F. Conduits in Filled Ground: Where indicated reinforce the footing and encasement for rigid nonmetallic conduits 10 feet beyond limits of fill. Reinforcement, footing or encasement is not required for rigid ferrous metal conduit.
- G. Conduits Entering Buildings and Manholes:
1. Seal conduit entrances into manholes watertight.
  2. Seal conduit entrances into building walls watertight. Exception: Seal is not required



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UNDERGROUND CONDUIT, DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

- in below grade foundation walls associated with slab on grade construction.
3. Install end bells at conduit entrances into manholes.
  4. Install end bells at conduit entrances into buildings. Exceptions:
    - a. Install insulated grounding bushing on conduit entrance stub up associated with slab on grade construction.
    - b. Install insulated grounding bushing and 2 locknuts on conduit where conduit is terminated in cabinet, junction or pull box.
- H. Cleaning Conduits: Take precautions to prevent foreign matter from entering conduits during installation. After installation clean conduits with tools designed for the purpose.
- I. Conduit for Future Use (Spare Conduit and Empty Conduit): Demonstrate to the Owner's Representative that conduits installed for future use are clear of obstructions (draw mandrel 1/2 inch less in diameter than conduit). Install a drag line in each conduit.
- J. Sealing Ends of Conduits:
1. Occupied Conduits: Seal ends of conduits to be used for Work of this contract until cables are to be installed. After cable installation, seal conduits at building entrances and first manhole outside building. Seal with duct seal.
  2. Conduits For Future Use: Seal the ends of spare and empty conduits at building entrances and manholes. Seal with plastic plugs or a contrasting color cement/sand mixture.
- K. Using Existing Underground Conduits: Clean the conduits with tools designed for the purpose. The condition of conduits after cleaning may be determined with a mandrel 1/2 inch less in diameter than the conduit, with the sheath painted with black lacquer. Pull mandrel through conduit. Conduit is acceptable when there are no roller marks or scratches on the mandrel. Other methods may be used if approved. Report and demonstrate to the Owner's Representative any defect found in the conduit system that cannot be eliminated. The Contractor is held responsible for any damage to cables resulting from imperfections in the conduit.

3.03 CONDUIT SCHEDULE - TYPES AND USE

- A. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
- B. Rigid Nonmetallic Conduit (Concrete Encased): May be installed in all locations except:
1. Where conduit stubs up or rises through slab or finished grade.
  2. Where other type raceways are specified or indicated on the drawings.
- C. Plastic Coated Rigid Metal Conduit: Use at locations indicated on drawings.

END OF SECTION

SECTION 262416  
PANELBOARDS

PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, UL.

1.02 SUBMITTALS

- A. Submittal Packages: Submit the shop drawings, product data, and the quality control submittals specified below at the same time as a package.
- B. Shop Drawings; include the following for each panelboard:
1. Cabinet and gutter size.
  2. Voltage and current rating.
  3. Panelboard short circuit rating. Indicate if rating is Fully Rated Equipment Rating, or where acceptable, UL listed Integrated Equipment Short Circuit Rating.
  4. Circuit breaker enumeration (frame, ATE, poles, I.C.).
    - a. Indicate if circuit breakers are suitable for the panelboards' Fully Rated Equipment Rating, or where acceptable, are series connected devices which have been test verified and listed with UL (include documentation proving the compatibility of the proposed circuit breaker combinations). Circuit breakers do not have to be listed as series connected devices when all of the circuit breaker interrupting ratings are equal to, or greater than, the short circuit rating of the panelboard.
  5. When indicated on the panelboard schedule, a coordinated selective scheme between the main circuit breaker and branch/feeder circuit breakers so that under fault conditions the branch/feeder circuit breaker clears the fault while the main circuit breaker remains closed.
  6. Accessories.
- C. Product Data:
1. Catalog sheets, specifications and installation instructions.
  2. Bill of materials.
- D. Quality Control Submittals:
1. List of Completed Installations: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for one year.
  2. Company Field Advisor Data, Include:
    - a. Name, business address and telephone number of Company Field Advisor secured for the required services.
    - b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
    - c. Services and each product for which authorization is given by the Company listed specifically for this project.

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- E. Contract Closeout Submittals:
1. System acceptance test report.
  2. Certificate: Affidavit, signed by the Company Field Advisor.
  3. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative.

1.03 QUALITY ASSURANCE

- A. Company Field Advisor: Secure the services of a Company Field Advisor from the manufacturer of the programmable solid state circuit breakers for a minimum of 8 working hours for the following:
1. Render advice regarding final adjustment and programming of the circuit breakers.
  2. Witness final system test and then certify with an affidavit that the circuit breakers are installed in accordance with the contract documents and are operating properly.
  3. Train facility personnel on the operation and maintenance of the circuit breakers (minimum of two 1 hour sessions).
  4. Explain available service programs to facility supervisory personnel for their consideration.

PART 2 PRODUCTS

2.01 PANELBOARDS

- A. As produced by Cutler-Hammer/Eaton Corp., Challenger Electrical Equipment Corp. General Electric Co., Siemens, or Square D Co., having:
1. Flush or surface type cabinets as indicated on the drawings.
  2. Increased gutter space for gutter taps, sub-feed wiring, through-feed wiring, oversize lugs.
  3. UL label "SUITABLE FOR USE AS SERVICE EQUIPMENT" where used as service equipment.
    - a. Where indicated, equip panelboards used as service equipment with secondary surge arresters; GE's Tranquell Series, Joslyn's Mfr. Co.'s Surge Tec Series, Intermatic Incorp.'s AG2401 or AG6503, Square D Co.'s SDSA 1175 or SDSA 3650, to suit system primary (transformer size, available current) and secondary characteristics.
  4. Door and one piece trim. Door fastened to trim with butt or piano hinges. Trim fastened to cabinet with devices having provision for trim adjustment.
  5. Door lock. 2 keys with each lock (Exception: Not more than 7 keys, total).
  6. Solid tinned copper bus bars. Ampere rating of bus bars not less than frame size of main circuit breaker.
  7. Full capacity copper neutral bus in panelboards where neutrals are required.
  8. Copper equipment grounding bus in panelboards where equipment grounding conductors are required.
  9. Sections designated "space" or "provision for future breaker" equipped to accept future circuit breakers.
  10. Lock on devices for exit light, fire alarm, stair well circuits.
  11. Provisions for padlocking circuit breaker handle in OFF position where indicated.

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PANELBOARDS

12. Directory.
13. Short circuit rating not less than indicated on panelboard schedule. Furnish panelboards having Fully Rated Equipment Rating (the short circuit rating of the panelboard is equal to the lowest interrupting rating of any device installed in the panelboard). Exception:
14. Molded case, bolt-on circuit breakers:
  - a. Mounting: Individually mounted main circuit breaker (when MCB is required), and group mounted branch/feeder circuit breakers to accommodate the circuit breaker style and panelboard construction.
  - b. Components: See panelboard schedule for specific components required for each circuit breaker. In addition to the specific components, equip each circuit breaker with additional components as required to achieve a coordinated selective scheme between the main circuit breaker and the branch/feeder circuit breakers when indicated on the panelboard schedule that a coordinated selective scheme is required.
  - c. Single pole 15 ATE and 20 ATE circuit breakers marked SWD where used as switches.
  - d. Single pole and two pole 15, 20, and 30 ATE circuit breakers rated for high intensity discharge lighting loads when applicable.

2.02 NAMEPLATES

- A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
  1. Phenolic: Two color laminated engravers stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (black lettering on a white background).
  2. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install panelboards in accordance with NEMA Publication No. PB1.1 "General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less".
  1. Set/program the circuit breakers.
- B. Flush Cabinets: Set flush cabinets so that edges will be flush with the finished wall line. Where space will not permit flush type cabinets to be set entirely in the wall, set cabinet as nearly flush as possible, and cover the protruding sides with the trim extending over the exposed sides of the cabinet and back to the finished wall line.
- C. Directory: Indicate on typewritten directory the equipment controlled by each circuit breaker, and size of feeder servicing panelboard. For power panelboards also include ATE rating and feeder size for each breaker.

SECTION 262416  
PANELBOARDS

D. Identification:

1. Provide nameplates corresponding to panelboard designations on the drawings, and electrical parameters (phase, wire, voltage).
2. Install a nameplate on each panelboard which explains the means of identifying each ungrounded system conductor by phase and system. Examples of nameplate statements:
  - a. Identification of 120/208 Volt Circuit Conductors:  
2 wire circuit - white\*, black.  
3 wire circuit - white\*, black, red.  
4 wire circuit - white\*, black, red, blue.

\*White is used only as neutral. Where neutral is not required, black, red, or black, red, blue is used for phase to phase circuits.

- b. Identification of 277/480 Volt Circuit Conductors:  
2 wire circuit - natural gray\*\*, brown.  
3 wire circuit - natural gray\*\*, brown, yellow.  
4 wire circuit - natural gray\*\*, brown, yellow, orange.

\*\*Natural gray is used only as neutral. Where neutral is not required, brown, yellow, or brown, yellow, orange is used for phase to phase circuits.

3.02 FIELD QUALITY CONTROL

A. Preliminary System Test:

1. Preparation: Have the Company Field Advisor adjust the completed circuit breakers and then operate them long enough to assure that they are performing properly.
2. Run a preliminary test for the purpose of:
  - a. Determining whether the circuit breakers are in a suitable condition to conduct an acceptance test.
  - b. Checking instruments and equipment.
  - c. Training facility personnel.

B. System Acceptance Test:

1. Preparation: Notify the Owner's Representative at least 3 working days prior to the test so arrangements can be made prior to the test to have a Facility Representative witness the test.
2. Make the following tests:
  - a. Test circuit breakers which have ground fault protection in accordance with the approved information sheets and test form.
  - b. Test programmable solid state trip devices in accordance with the manufacturer's recommendations.
3. Supply all equipment necessary for system adjustment and testing.
4. Submit written report of test results signed by the Company Field Advisor and the Owner's Representative. Mount a copy of the final report in a conspicuous location on, or inside, the panelboard door.

END OF SECTION

SECTION 262726  
WIRING DEVICES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 SWITCHES

A. Local Switches, Single Pole:

1. 15A, 120/277 V ac; Bryant's 4801, Crouse-Hinds/AH's 1891, General Electric's GE5931-1G, Hubbell's 1201/1101, Leviton's 1201/1101, Pass & Seymour's 15AC1, or Woodhead's 1891.
2. 20A, 120/277 V ac; Bryant's 4901, Crouse-Hinds/AH's 1991, General Electric's GE 5951-1G, Hubbell's 1121/1221, Leviton's 1121/1221, Pass & Seymour's 20AC1, or Woodhead's 1991.
3. 30A, 120/277 V ac; Bryant's 3001, Crouse-Hinds/AH's 3991, General Electric's GE 5991-1G, Hubbell's 3031, Leviton's 3031, or Pass & Seymour's 30AC1.

B. Local Switches, Double Pole:

1. 15A, 120/277 V ac; Bryant's 4802, Crouse-Hinds/AH's 1892, General Electric's GE5932-1G; Hubbell's 1202/1102, Leviton's 1202/1102, Pass & Seymour's 15AC2, or Woodhead's 1892.
2. 20A, 120/277 V ac; Bryant's 4902, Crouse-Hinds/AH's 1992, General Electric's GE5952-1G, Hubbell's 1222/1122, Leviton's 1222/1122, Pass & Seymour's 20AC2, or Woodhead's 1992.
3. 30A, 120/277 V ac; Bryant's 3002, Crouse-Hinds/AH's 3992, General Electric's GE5992-1G, Leviton's 3032, or Pass & Seymour's 30AC2.

C. Local Switches, Three-Way:

1. 15A, 120/277 V ac; Bryant's 4803, Crouse-Hinds/AH 1893, General Electric's GE5933-1, Hubbell's 1203/1103, Leviton's 1203/1103, Pass & Seymour's 15AC3, or Woodhead's 1893.
2. 20A, 120/277 V ac; Bryant's 4903, Crouse-Hinds/AH's 1993, General Electric's GE5953-1G, Hubbell's 1223/1123, Leviton's 1223-2/1123-2, Pass & Seymour's 20AC3, or Woodhead's 1993.
3. 30A, 120/277 V ac; Bryant's 3003, Crouse-Hinds/AH's 3993, General Electric's GE5993-1G, Leviton's 3033, or Pass & Seymour's 30AC3.

D. Local Switches, Four-Way:

1. 15A, 120/277 V ac; Bryant's 4804, Crouse-Hinds/AH's 1894, General Electric's GE5934-1G, Hubbell's 1204/1104, Leviton's 1204-2/1104-2, Pass & Seymour's 15AC4, or Woodhead's 1894.
2. 20A, 120/277 V ac; Bryant's 4904, Crouse-Hinds/AH's 1994, General Electric's GE5954-1G, Hubbell's 1224/1124, Leviton's 1224-2/1124-2, Pass & Seymour's 20AC4, or Woodhead's 1994.

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3. 30A, 120/277 V ac; Crouse-Hinds/AH's 3994, or General Electric's GE5994-1G.
- E. Local Switches, Key-Operated:
  1. Similar to toggle type local switches except operated by removable key instead of lever. Furnish 2 keys with each switch.
- F. Motor Switch:
  1. Toggle type, fractional hp Manual Starter with Melting Alloy Type Thermal Overload Relay, 115/230 V, 16A, Square D Class 2510 or approved equivalent.

2.02 RECEPTACLES

- A. Specification Grade Receptacles:
  1. Single receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W); Bryant's 5251, Crouse-Hinds/AH's 5251, General Electric's 5251-1, Hubbell's 5251, Leviton's 5251, or Pass & Seymour's 5251.
  2. Duplex receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W); Bryant's 5252/5242, Crouse-Hinds/AH's 5252/5242, General Electric's GEN5252-1, Hubbell's 5252/5242, Leviton's 5252/5242, Pass & Seymour's 5252/5242.
  3. Single receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Bryant's 5361/5351, Crouse-Hinds/AH's 5361/5351, General Electric's GE4103-1, Hubbell's 5361/5351, Leviton's 5361/5351, or Pass & Seymour's 5351.
  4. Duplex receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Bryant's 5362, Crouse-Hinds/AH's 5352/5342, General Electric's GE5352-1, Hubbell's 5352, Leviton's 5352, or Pass & Seymour's 5352.
- B. Ground Fault Interrupter Receptacles:
  1. Duplex receptacle rated 15A (NEMA 5-15R), circuit-ampacity 20A; Bryant's GFR52FT, Crouse-Hinds/AH's GF5242, General Electric's GF5242, Hubbell's GF5252, Leviton's 6599, Pass & Seymour's 1591S, or Daniel Woodheads 5252GF.
  2. Duplex receptacle rated 20A (NEMA 5-20R), circuit ampacity 20A; Bryant's GFR53FT, Crouse-Hind/AH's GF5342, General Electric's GF5342, Hubbell's GF 5352, Leviton's 6899, Pass & Seymour's 2091S, or Daniel Woodheads 5352GF.
- C. Isolated Ground Receptacles:
  1. Single receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W); Hubbell's IG5261, Leviton's 5261-IG, Cooper Wiring Devices IG5261.
  2. Duplex receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W); Hubbell's IG-5262, Leviton's 5262-IG, Cooper Wiring Devices IG5262.
  3. Single receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Hubbell's IG5361, Cooper Wiring Devices IG5361.
  4. Duplex receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Hubbell's IG5362, Leviton's 5362-IG, Cooper Wiring Devices IG5362.
- D. Corrosion Resistant Receptacles:
  1. Duplex receptacle, NEMA 5-15R (15A, 125 V, 2P, 3W): Bryant's 5262-CR, Crouse-Hinds/AH's 5262CR, General Electric's GE5262-C, Hubbell's 5262-ILH or Pass & Seymour's CR6200.

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- E. Special Purpose Receptacles: Furnish matching nylon, polycarbonate or armored plug with each receptacle as specified as follows or on the drawing.
  - 1. Dryer Outlet: NEMA 10-30R (3P, 3W, 30A, 125/250 V); Bryant's 9303, Crouse-Hinds/AH's 9344N, General Electric's GE4132-3, Hubbell's 9350, Leviton's 5207, or Pass & Seymour's 3860.
  - 2. Range Outlet: NEMA 10-50R (3P, 3W, 50A, 125/250 V); Bryant's 9306, Crouse-Hinds/AH's 7985N, General Electric's GE4152-3, Hubbell's 7962, Leviton's 5206GR, or Pass & Seymour's 3890.
  - 3. Other Types: As produced by Bryant, Crouse-Hinds/AH, General Electric, Hubbell, or Pass & Seymour. NEMA configuration and ratings to suit requirements.

2.03 WALL PLATES

- A. Stainless Steel Wall Plates: Type 302 stainless steel with satin finish; Hubbell's 97000 Series, Leviton's 84000 Series, or Cooper Wiring Devices 93000 Series.
- B. Covers for Threaded Type Boxes: Stamped sheet steel, gasketed device covers as produced by Crouse-Hinds Co., or OZ/Gedney Co.

2.04 EMERGENCY SHUTDOWN SWITCHES

- A. Emergency Shutdown Pushbutton Switch: Square D. Co.'s Class 9001, Type K, pushbutton operator with the following:
  - 1. Red mushroom button.
  - 2. Transformer type red pilot light.
  - 3. Legend red plate with words "Emerg. Stop".
  - 4. NEMA 13 oil tight enclosure with cover riveted to body.

2.05 NAMEPLATES

- A. Phenolic Type: Standard white phenolic nameplates with 3/16 inch minimum size black lettering engraved thereon.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install wiring devices in outlet boxes.
- B. Local Switches:
  - 1. Install local switches rated 15A, 120/277 V ac for switches unless otherwise shown on the drawings or specified.
  - 2. Install switches indicated Sa, Sb, Sc, etc, for control of outlets or fixtures with corresponding letters on the same circuit.
  - 3. Where more than one switch occurs at same location in a 120 volt system, arrange



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WIRING DEVICES

- switches in gangs and cover with one face plate.
4. Install switches in a 277 volt system in separate single boxes if voltage between exposed live metal parts of adjacent switches exceeds 300 volts.
  5. Install single and double pole switches so that switch handle is up when switch is in the "On" position.
- C. Receptacles:
1. Install Specification Grade receptacles, NEMA 5-15R, 15A, 125 V, 2P, 3W, for duplex receptacles and single receptacles unless otherwise shown on the drawings or specified.
  2. Install receptacles with ground pole in the down position.
- D. Wall Plates:
1. Install wall plates on all wiring devices in dry locations, with finish to match hardware in each area.
  2. Install blank wall plates on outlet boxes which are for future equipment except telephone outlets.
  3. Install 5/8 inch bushed wall plates on telephone outlets.
- E. Weatherproof Covers: Install weatherproof covers on wiring devices in damp and wet locations.
- F. Nameplates: Provide phenolic or embossed aluminum nameplate for each special purpose receptacle indicating phase, ampere and voltage rating of the circuit. Attach nameplate with rivets or tamperproof fasteners to wall plate or to wall above receptacle. Wall plates may be engraved with required data in lieu of separate nameplates.
- G. Mats: Where flush plates are required over outlet boxes that cannot be set deep enough for the plates to fit closely over the finished wall surfaces, provide oak mats to fill the space between the finished wall surface and the plate.

END OF SECTION

SECTION 262813  
FUSES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

1.02 MAINTENANCE

- A. Spare Parts:
1. Six spare fuses of each size and category, including any accessories required for a complete installation.
  2. Special tools if required for installation or removal of fuses.

PART 2 PRODUCTS

2.01 FUSEHOLDERS

- A. Equipment provided shall be furnished with fuseholders to accommodate the fuses specified.

2.02 FUSES RATED 600V OR LESS

- A. Fuses for Safety Switches (Motor Circuits) and Service Disconnects:
1. Cartridge Type (250 Volts, 600 Amperes or Less): Dual element time-delay, UL Class RK-5, 200,000 amperes R.M.S. symmetrical interrupting capacity:
    - a. Cooper Industries Inc.'s/Bussman Div. Type FRN-R.
    - b. Gould Inc.'s/Circuit Protection Div. (Shawmut) Type TR-R.
    - c. Littlefuse Inc.'s Type FLN-R.
  2. Cartridge Type (600 Volts, 600 Amperes or Less): Dual element time-delay, UL Class RK-5, 200,000 amperes R.M.S. symmetrical interrupting capacity:
    - a. Cooper Industries Inc.'s/Bussmann Div. Type FRS-R.
    - b. Gould Inc.'s/Circuit Protection Div. (Shawmut) Type TRS-R.
    - c. Littlefuse Inc.'s Type FLS-R.
  3. Cartridge Type (600 Volts or Less - Above 600 Amperes): Current limiting, UL Class L, 200,000 amperes R.M.S. symmetrical interrupting capacity:
    - a. Cooper Industries Inc.'s/Bussmann Div. Type KTU.
    - b. Gould Inc.'s Circuit Protection Div. (Shawmut) Type A4BY.
    - c. Littlefuse Inc.'s Type KLP-C.
- B. Fuses for Safety Switches (Lighting and Heating Circuits):
1. Cartridge Type (250 Volts): Single element, UL Class RK-1, 200,000 amperes R.M.S. symmetrical interrupting capacity:
    - a. Cooper Industries Inc.'s/Bussmann Div., Type KTN-R.
    - b. Gould Inc.'s/Circuit Protection Div. (Shawmut) Type A2K-R.
    - c. Littlefuse Inc.'s Type KLN-R.
  2. Cartridge Type (600 Volts): Single element, UL Class RK-1, 200,000 amperes

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R.M.S. symmetrical interrupting capacity:

- a. Cooper Industries Inc.'s/Bussmann Div. Type KTS-R.
- b. Gould Inc.'s/Circuit Protection Div. (Shawmut) Type A6K-R.
- c. Littlefuse Inc.'s Type KLS-R.

2.03 FUSES RATED OVER 600V

- A. Fuses for Metal Enclosed Interrupter Switchgear:
  - 1. Current Limiting, Silver-Sand Type: General Electric Co.'s Type EJ.
  - 2. Boric-Acid Type: S & C Electric Co.'s Type SM with snuffler, or Westinghouse Elec. Corp.'s Type RBA with condenser.
- B. Fuses for Fused Load Break Interrupter Switches: General Electric Co. Type EJ, or S & C Electric Co.'s Type SM.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install fuses in respective equipment.

END OF SECTION

SECTION 262816  
ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Enclosed Circuit Breakers: As produced by Square D Co., General Electric Co., or Westinghouse/Cutler Hammer Corp. having:
1. NEMA 1 enclosure unless otherwise indicated on the drawings.
  2. Solid neutral.
  3. Voltage rating, current rating, symmetrical current interrupt rating as indicated on drawing and number of poles as indicated on the drawings.
  4. Circuit breakers to suit requirements.
  5. Under 50 ampere trip element, enclosure has means to lock circuit breaker position on or off using standard padlock.
  6. Ampere trip elements 50 and above have industrial type enclosure with door and side handle. Handle position is lockable using standard padlock.

2.02 NAMEPLATES

- A. Phenolic: Engraved plates, minimum 3/4" wide and length as required by inscription: Seton Name Plate Corp.
- B. Stamped Metal: Standard stamped or embossed aluminum tags, minimum 3/4" wide and length as required by inscription: Tech Products, Inc.; Seton Name Plate Corp.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Mount enclosed circuit breakers on wall so that maximum height above the floor to the center of operating handle does not exceed 6-1/2'.
- B. Provide phenolic or stamped metal nameplates on cover of each enclosed circuit breaker indicating purpose or load served by the circuit breaker.

END OF SECTION

SECTION 262816  
ENCLOSED CIRCUIT BREAKERS

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SECTION 262817  
SAFETY SWITCHES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 SAFETY SWITCHES (SINGLE THROW)

- A. NEMA 1, 3R, 4 (Stainless Steel), 12: Challenger's Heavy Duty Series, Cutler-Hammer Inc.'s DH, General Electric Co.'s Type TH, or Square D Co.'s Heavy Duty Series, having:
1. Fuses, or unfused as indicated on drawings.
  2. Fused switches equipped with fuseholders to accept only the fuses specified in Section 16416 (UL Class RK-1, RK-5, L).
  3. NEMA 1 enclosure unless otherwise indicated on drawing.
  4. 240V rating for 120V, 208V, or 240V, circuits.
  5. 600V rating for 277V, or 480V circuits.
  6. Solid neutral bus when neutral conductor is included with circuit.
  7. Ground bus.
  8. Current rating and number of poles as indicated on drawings.
- B. NEMA 4X: Crouse-Hinds Co.'s NST, or Square D Co.'s Special Application Safety Switches; having:
1. Fuses, or unfused as indicated on drawings.
  2. Fused switches equipped with fuseholders to accept only the fuses specified in Section 16416 (UL Class RK-1, RK-5, L).
  3. Molded fiberglass-reinforced polyester NEMA 4X enclosure.
  4. 240V rating for 120V, 208V, or 240V, circuits.
  5. 600V rating for 277V, or 480V circuits.
  6. Solid neutral bus when neutral conductor is included with circuit.
  7. Ground bus.
  8. Current rating and number of poles as indicated on drawings.

2.02 NAMEPLATES

- A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
1. Phenolic: Two color laminated engravers stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
  2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
  3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

SECTION 262817  
SAFETY SWITCHES

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install switches so that the maximum height above the floor to the center of the operating handle does not exceed 6'-6".
- B. Identify each safety switch, indicating purpose or load served:
  - 1. NEMA 1 Enclosures: Rivet or bolt nameplate to the cover.
  - 2. NEMA 12 Enclosures: Rivet or bolt and gasket nameplate to the cover.
  - 3. NEMA 3R, 4, 4X Enclosures: Attach nameplate to the cover using adhesive specifically designed for the purpose, or mount nameplate on wall or other conspicuous location adjacent to switch. Do not penetrate enclosure with fasteners.

END OF SECTION

SECTION 265119  
LIGHT-EMITTING DIODE (LED) FIXTURES

PART 1        GENERAL

1.01    SUBMITTALS

- A.    Product Data: Catalog sheets, specifications and installation instructions, including:
  - 1.    Technical information for each fixture that proves that it meets specified requirements. Include data which proves proposed lamp and ballast combinations do not exceed specified total harmonic distortion.
  - 2.    Candlepower distribution curves for each type fixture if different from Company or catalog number specified.
- B.    Samples: One of each product if requested.
- C.    Quality Control Submittals:
  - 1.    List of Installations for Electronic Ballasts: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for 1 year. The installations shall present a grand total of at least 5000 ballasts.

1.02    QUALITY ASSURANCE

- A.    Equipment Qualifications For Products Other Than Those Specified:
  - 1.    At the time of submission provide written notice to the Owner's Representative of the intent to propose and "or equal" for products other than those specified. Make the "or equal" submission in a timely manner to allow the Owner's Representative sufficient time to review the proposed product, perform inspections and witness test demonstrations.
  - 2.    If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Owner's Representative and the Company Field Advisor.
    - a.    Make arrangements with the owners of 2 installations (selected by the Owner's Representative) for inspection of the installations by the Owner's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Owner's Representative a minimum of 3 weeks prior to the availability of the installations for the inspection and provide at least one alternative date for each inspection.
    - b.    Only references from the actual owner or owner's representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted.



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LIGHT-EMITTING DIODE (LED) FIXTURES

References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.

- 1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
  - a. Make arrangements with the test facility for the Owner's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Owner's Representative a minimum of 3 weeks prior to the availability of the test facility and provide at least one alternative date for the testing.
4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

PART 2 PRODUCTS

2.01 LUMINAIRES

- A. Type High Bay LED: Full metal fixture liner inside reinforced fiberglass housing: Cooper Metalux Skybar LED:
  1. Lamp Type: LED.
  2. Fixture Length: 4'
  3. Luminaire to operate at 120 - 277V and connected for operation on 120V circuit, unless otherwise indicated on drawing.
  4. Mounting:
    - a. Ceiling Surface mounted.
  5. Housing:
    - a.
  6. Fixture is suitable for operation from -20 degrees C to 25 degrees c ambient conditions.
  7. Wet location Listed.
  8. IP56
  9. LED lamp listed IESNA LM79/LM80
  10. 5 year warranty.
- B. Type Wall Mount Luminaire. Area Light: Rugged, Five stage super TGIC polyester powder coat paint aluminum housing. McGraw-Edison Impact Elite LED
  1. Lamp Type: Solid State LED.
  2. Luminaire to operate at 120 - 277V and connected for operation on 120V circuit, unless otherwise indicated on drawing.
  3. Mounting:
    - a. Wall mounted.
  4. Housing:
    - a. Five stage super TGIC polyester powder coat paint aluminum housing.
  5. Fixture is suitable for operation from -40 degrees C to 40 degrees c ambient conditions.
  6. Wet location Listed.
  7. IP66
  8. LED lamp listed UL 8750, LM79, LM80, ISO 9001

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LIGHT-EMITTING DIODE (LED) FIXTURES

- C. Type LED Parking Garage, Canopy, Low-bay Luminaire: Rugged, die-cast, aluminum housing. all polycarbonate one piece McGraw-Edison TT toptier LED
1. Lamp Type: Solid State LED.
  2. Luminaire to operate at 120V circuit, unless otherwise indicated on drawing.
  4. Mounting:
    - a. Wall mounted.
  5. Housing:
    - a. low copper die-cast, single piece aluminum.
  6. Glass lens, reflective backing plates
  7. Fixture is suitable for operation from -40 degrees C to 40 degrees c ambient conditions.
  9. IP66, ISO 9001
  10. LED lamp listed UL 8750
- D. Type LED Wall, Wall mount battery backup. Nominal 2-3/4" x10" housing constructed form extruded aluminum and die-formed 20 gauge cold rolled steel. Corelite Divide
1. Lamp Type: LED.
  2. Luminaire to operate at 120V circuit, unless otherwise indicated on drawing.
  4. Mounting:
    - a. Wall mounted.
  5. Housing:
    - a. extruded aluminum and die-formed 20 gauge
  6. Direct/indirect light
  7. Damp location Listed.
  8. LM79/LM90
  9. LED lamp listed UL 1598
- E. Type LED suspended, suspended. Nominal 2-1/4" x12" housing constructed form extruded aluminum and die-formed 20 gauge cold rolled steel. Corelite Divide
1. Lamp Type: LED.
  2. Luminaire to operate at 120V circuit, unless otherwise indicated on drawing.
  3. Mounting:
    - a. Suspended by aircraft cable.
  4. Housing:
    - a. extruded aluminum and die-formed 20 gauge
  5. Direct/indirect light
  6. Damp location Listed.
  7. LM79/LM90
  8. LED lamp listed UL 1598
- E. Type LED grid ceiling 2'x2' troffer housing constructed form code guage prime cold rolled steel. Metalux Cruze
1. Lamp Type: LED 4.0
  2. Luminaire to operate at 120V circuit, unless otherwise indicated on drawing.
  3. Mounting:
    - a. 4 grid clips per fixture.

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4. Housing:
  - a. extruded aluminum and die-formed 20 gauge
5. Direct/indirect light
6. Damp location Listed.
7. LM79/LM90
8. LED lamp listed UL 1598

F. Type LED wall mound scone Scott Arc Lighting

1. Lamp Type: LED
2. Luminaire to operate at 120V circuit, unless otherwise indicated on drawing.
3. Mounting:
  - a. wall mounted scone
4. Housing:
  - a. Brushed Nickel

2.02 LIGHTING CONTROLS AND COMMUNICATION

- A. Summary – The lighting in the locker room, truck room, vestibules, training space, and the exterior of the building shall be on a lighting controllers. The lighting controllers for the locker room, truck room, vestibule, and exterior shall be connected to the fire siren control panel. Whenever a fire siren is activated a relay in the fire siren control panel will close sending a signal to the lighting controllers to turn on the lights in the locker room, truck room, vestibule, and exterior. The training space controller shall be configured to power and dim lights in the training space.
- B. Lighting Controllers - LMRC
1. Dimming room controller On/Off/0-10V
  2. Single Phase 120VAC 60Hz input.
  3. Three relay room controller
  4. Each relay rated for 120V, 20A ballast or incandescent.
  5. Class 2 output to DLM local network:24VDC, up to 250mA across 4 RJ45 ports.
  6. UL and cUL listed
  7. Five year warranty
  8. Wattstopper LMRC-210 Series model number LMRC-213 or engineer approved equal.
  9. Locations: Locker Room, Truck Bay, Vestibule, Exterior Lighting, Training Space. Quantity five (5).
- C. Input Output Interface - LMIO
1. Input/output voltage:24VDC from the digital lighting management DLM network.
  2. Max Current consumption 20mA
  3. DLM local network connection shall be two RJ45 ports.
  4. Removable terminal block for connections to isolated relay output and third party inputs.
  5. Isolated relay ratings:
    - a. 24VDC/VAC, 1A, SPDT

SECTION 265119  
LIGHT-EMITTING DIODE (LED) FIXTURES

- b. Normally open (N/O), normally closed (N/C) and common outputs.
  - 6. UL listed
  - 7. 5 year warranty
  - 8. The input output interface shall be a Wattstopper model LMIO-101 or approved equal.
  - 9. Quantity one (1)
- D. Control Switches – LMSW
  - 1. Input voltage – 24VDC from DLM network
  - 2. Current consumption 5mA
  - 3. Connection to DLM network through two RJ45 ports
  - 4. UL listed
  - 5. Five year warranty
  - 6. Control Switches shall be Wattstopper LMSW-100 Series
    - a. LMSW-KIT-101 1 button kit for the locker room and vestibule quantity two (2).
    - b. LMSW-KIT-102 2 button kit for training space quantity four (4).
    - c. LMSW-KIT-103 3 button kit for Locker Room, Truck Bay, Vestibule, Exterior Lighting quantity two (2).
    - d. LMSW-KIT-104 4 button kit for Locker Room, Truck Bay, Vestibule, Exterior Lighting quantity three (3).
    - e. LMSW-KIT-108 8 button kit for training space quantity four (4).
- E. Software
  - 1. Contractor shall furnish and install all software for a complete and functional digital lighting management system.
  - 2. This shall include programming all lighting circuits.
  - 3. Contractor shall furnish and install startup and testing of all hardware and software in the digital lighting management network.
  - 4. Contractor shall furnish training for the digital lighting management network. This shall include eight (8) hours of training.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Install fixtures at locations indicated on the drawings.
- B. Finishing Collar or Combination Finishing Collar/Outlet Box (Surface Mounted Fixture Used With Exposed Raceway):
  - 1. Provide finishing collar where surface mounted fixture is installed on an exposed raceway outlet box and the fixture base is larger than the outlet box.
  - 2. Provide combination finishing collar/outlet box where surface mounted fixture is not indicated to be installed on an exposed raceway outlet box, but raceway cannot be run directly into fixture body due to fixture design.

END OF SECTION

SECTION 265119  
LIGHT-EMITTING DIODE (LED) FIXTURES

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SECTION 265213  
EMERGENCY LIGHTING – UNIT EQUIPMENT

PART 1 GENERAL

1.01 SUBMITTALS

- A. Submittal Package: Submit the product data items specified below at the same time as a package.
- B. Product Data:
  - 1. Catalog sheets, specifications and installation instructions.
  - 2. Battery warranty.
  - 3. Name, address and telephone number of nearest fully equipped service organization.
- C. Project Closeout Submittals:
  - 1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative. Include name, address and telephone number of the nearest fully equipped service organization.

1.02 QUALITY ASSURANCE

- A. List of Completed Installations: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for 3 years.
- B. Service Availability: A fully equipped service organization shall be available to service the completed Work.

PART 2 PRODUCTS

2.01 EMERGENCY LIGHTING UNITS

- A. Refer to the Lighting Fixture Schedule on the drawings for emergency fixtures required for the project.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the Work of this Section in accordance with the manufacturer's printed instructions.
- B. Insert a copy of the battery warranty in each unit and mark on batteries the date placed in service.

END OF SECTION

SECTION 265213  
EMERGENCY LIGHTING – UNIT EQUIPMENT

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SECTION 265214  
EXIT LIGHT FIXTURES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.
- B. Samples: One of each product if different from Company or catalog number specified.

1.02 QUALITY ASSURANCE

- A. List of Installations: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for one year.

PART 2 PRODUCTS

2.01 EXIT LIGHT FIXTURES

- A. Refer to the Lighting Fixture Schedule on the drawings for description of Exit Fixtures required for the project.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the Work of this Section in accordance with the manufacturer's printed instructions.

END OF SECTION



SECTION 265214  
EXIT LIGHT FIXTURES

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SECTION 266216  
TRANSFORMERS – DRY TYPE, UNDER 600V

PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, ANSI, IEEE, and UL.

1.02 SUBMITTALS

- A. Submittals Package:
1. For Transformers Rated 75KVA and Below: Submit the product data, and quality control submittals specified below all at the same time as a package.
- B. Product Data: Catalog sheets, specifications and installation instructions.
- C. Quality Control Submittals:
1. Transformers Rated 75KVA and Below: Submit certified report of the Company's routine commercial NEMA tests for each type transformer.
- D. Contract Closeout Submittals:
1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Owner's Representative.
  2. Energy Efficiency Rebate Documentation:
    - a. Deliver 2 copies of documentation to the Owner's Representative showing the costs associated with purchase of any Energy Star labeled transformers.
      - 1) Submittal of confidential or proprietary documentation may be accommodated thru the rebate organization's legal declarations.
    - b. The documentation will be forwarded to Facility supervisory personnel for their use in pursuing energy efficiency rebate incentive funds that may be, or may become, available during the course of this Contract thru organizations such as:
      - 1) New York State Energy Research and Development Authority (NYSERDA): New York Energy Smart program (518) 862-1090, [www.nyserda.org](http://www.nyserda.org).

1.03 DELIVERY, STORAGE AND HANDLING

- A. Storage of Transformers: Provide supplemental heating devices, such as incandescent lamps or low wattage heaters within the enclosure or under a protective covering to control dampness. Maintain this protection from the time equipment is delivered to the site until it is energized.

SECTION 266216  
TRANSFORMERS – DRY TYPE, UNDER 600V

PART 2 PRODUCTS

2.01 DRY TYPE TRANSFORMERS

- A. By Acme Electric Corp. Power Products Div., Cutler-Hammer Inc., General Electric Co., Jefferson Electric Inc., Niagara Transformer Corp., Sola/Hevi-Duty Unit of General Signal, or Square D Co.:
  - 1. Two winding insulating type construction.
  - 2. Labeled for EPA Energy Star Program (based on NEMA TP1 Guide for Determining Energy Efficiency for Distribution Transformers), except where a specific type of dry type transformer is indicated on the drawings.
  - 3. Enclosures For Transformers Installed In Dry Protected Locations (unless otherwise indicated):
    - a. Ventilated enclosure for transformers rated over 10KVA.
    - b. Enclosures for transformers rated 10KVA and under may be ventilated or non-ventilated.
  - 4. Enclosure For Transformers In Damp Locations (unless otherwise indicated):
    - a. Outdoor/ventilated enclosure equipped with weathershields for transformers rated over 10KVA.
    - b. Enclosures for transformers rated 10KVA and under may be ventilated enclosure equipped with weathershields or non-ventilated.
  - 5. Primary Taps (minimum of): 3-15KVA two-5 percent FCBN, over 15 KVA four 2-1/2 percent FCBN and two 2-1/2 percent FCAN.
  - 6. Mounting accessories.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install dry type transformers where indicated on the drawings.

END OF SECTION

## **Division 31**



SECTION 310513  
EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Excavating
- B. Preparing Subgrade for Fill, Foundations, Pavement
- C. Placing and Compacting Soil and Aggregate Fill, Drainage Course, Subbase, Base
- D. Backfilling at Structures, Utilities and Appurtenances
- E. Grading

1.02 REFERENCES

ASTM (American Society for Testing and Materials)

- A. D 422 Particle Size Analysis for Soils
- B. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort D 1241 Specification for Soil-Aggregate Subbase, Base and Surface Courses
- C. D 2216 Moisture Content of Soil and Rock
- D. D 2487 Classification of Soils for Engineering Purposes
- E. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods
- F. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports
- G. D 3017 Water Content of Soil and Rock In Place by Nuclear Methods
- H. E 1643 Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
- I. OSHA (Occupational Safety and Health Administration) , 29 CFR Part 1926

1.04 DEFINITIONS

- A. *Additional Excavation* is the removal and disposal of material encountered below the Subgrade elevation indicated on the Drawings as authorized in writing by the Engineer.
- B. *Excavation* is the removal and disposal of material encountered above the Subgrade elevation indicated on the Drawings. Excavation also includes removal and disposal of hard, compacted or cemented material down to eight inches below the Subgrade Elevation indicated on the Drawings if required in the judgment of the Engineer. The removal and disposal of hard, compacted or cemented material will be considered rock excavation if the material is rock as defined in specifications and this section.
- C. *Fill* is Soil and Aggregate Material placed according to these Specifications to raise the subgrade

SECTION 310513  
EARTHWORK

elevation to the elevation indicated on the Drawings.

- D. *Maximum Density* is the maximum dry density determined by ASTM D 698.
- E. *Optimum Moisture Content* is the moisture content that corresponds to the Maximum Density.
- F. *Rock* is all hard, compacted or cemented material that in the judgment of the Engineer requires blasting or cannot be ripped using a Cat 330 with a heavy-duty, single-tooth ripping attachment.
- G. *Structure* is any building, foundation, slab, curb, utility or appurtenance permanently installed above or below the ground surface.
- H. *Subgrade* is the undisturbed earth or compacted fill immediately below the drainage course, subbase, or topsoil.
- I. *Unauthorized Excavation* is the removal or disposal of any material other than Excavation or Additional Excavation.
- J. *Unsuitable* is material that does not comply with these specifications.

1.05 SUBMITTALS

- A. Test Reports
  - 1. Classification of Soil and Aggregate Materials for each specified purpose
  - 2. Compaction Characteristics of Soil and Aggregate Materials for use as Fill
  - 3. In Place Density Determinations for Fill
- B. Project Record Documents
  - 1. Plan drawing of final Subgrade and buried Structure elevations

1.06 QUALITY ASSURANCE

- A. Qualifications
  - 1. Subject to Engineer approval
- B. Regulatory Requirements
  - 1. Notify potential owners of Underground Utilities of Excavation Schedule at least three days prior to initial Earthwork or earlier if required by law.
  - 2. Perform all Excavation in accordance with Department of Labor, Occupational Health and Safety Administration Standards for Excavation - 29 CFR 1926
- C. Pre-Installation Conference
  - 1. Coordinate with the Engineer at least one week prior to the initial Earthwork to confirm the receipt of Material samples and to present a schedule of Earthwork.

1.07 PROJECT/SITE CONDITIONS

- A. Environmental Requirements
  - 1. Perform Earthwork only when air temperature is above 28°F.
  - 2. Perform Earthwork only when moisture conditions allow compliance with these specifications and do not promote deterioration of Subgrade or completed Work.
  - 3. Perform Earthwork only during the hours from sunrise to sunset except as otherwise

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EARTHWORK

specified in writing by the Engineer

4. Perform Earthwork only when wind conditions do not cause Soil or Aggregate dust to leave the site of the Work.

B. Existing Conditions

1. Review the geotechnical exploration of the site.
2. Promptly and before such conditions are disturbed, notify the Owner in writing of subsurface or latent physical conditions at the site differing from those indicated in this contract, or unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent work of the character provided for in this contract. The Owner shall investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the contractor's cost of, or the time required for, performance of any of the work under this contract, whether or not as a result of those conditions, an equitable adjustment shall be made and the contract modified in writing accordingly. No claim of the contractor under this clause shall be allowed unless the contractor has given the notice required above. No claim by the contractor for an equitable adjustment shall be allowed if ascertained after final payment under this contract.

C. Field Measurements

1. Survey cross-sections prior to and following the completion of Work Items to compute any rock excavation quantities. (Load counts, Weight tickets or other material quantity estimates not based on surveyed cross sections will not be accepted as evidence of rock excavation quantities.) Survey cross-sections for general excavation shall be submitted for records, however, the quantity of these excavations are included as a lump sum item and will not affect the Contract Price.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide Soil and Aggregate Materials as required.

2.02 EQUIPMENT

- A. Provide operable Compaction Equipment (for areas 15 feet or more wide) prior to the initial Earthwork:
1. of the vibratory smooth steel drum type (for GW or SW soils) or the vibratory steel pad foot drum type (for GP, GM, SP or SM) or the sheeps foot or wobble wheel type for (CL, ML, CH, MH, GC, or SC soils) manufactured for the purpose of compacting soil and aggregate of the characteristics of the Soil or Aggregate being used
  2. of static weight of at least twenty five tons
  3. capable of achieving the specified densities within six passes
- B. Provide operable Compaction Equipment (for areas less than 15 feet wide including utility trenches and structure backfill zones) at times when adjacent wider zones of fill are being compacted so that the narrow zones can be compacted simultaneously where practical. Compaction Equipment must be suitable to the Soil and Aggregate being used.
- C. Provide operable Moisture Conditioning Equipment prior to the initial Earthwork that:
1. includes a trailer or vehicle mounted tank and spray arm
  2. includes a means of delivering potable water to the site



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3. includes a disc harrow, spring-tooth harrow or other equipment with similar capability to loosen and aerate soil and aggregate

2.03 SOURCE QUALITY CONTROL

- A. Provide submittals and testing of every proposed soil as required in the specifications

PART 3 EXECUTION

3.01 EXCAVATION

- A. Excavate Soil to the Subgrade Elevation indicated on the Drawings after clearing, grubbing and stripping topsoil.
- B. If Rock, as defined in this Section and the specifications is encountered, excavate below the Subgrade Elevation indicated on the Drawings.

3.02 PREPARATION FOR STRUCTURES AND FILL

- A. Protect structure foundation area from disturbance by heavy equipment traffic.
- B. Establish temporary surface drainage improvements in conjunction with Erosion and Sediment Control Measures so that work areas do not impound water.
- C. Proof roll subgrade after clearing, grubbing and stripping topsoil and before placing any fill using a completely loaded dump truck, or a fully ballasted rubber tired proof roller weighing at least 25 tons.
- D. Proof roll in two perpendicular directions using two complete overlapping coverages of each part of the surface to receive a Structure or Fill.
- E. Proof roll only under the observation of the Engineer or the representative designated by the Engineer.
- F. Over-excavate any weak, soft or otherwise unsuitable areas that, in the sole judgment of the Engineer, do not adequately withstand proof rolling until adequate subgrade is achieved.

3.03 FILL PLACEMENT AND COMPACTION

- A. Bench existing slopes steeper than one vertical to four horizontal so that nearly horizontal benches at least six inches deep at the cut side are created.
- B. Scarify to a depth of at least six inches, moisture condition and recompact all existing surfaces to receive fill except as otherwise specified in writing by the Engineer.
- C. Spread fill in nearly horizontal lifts no more than eight inches thick, loose measure (four inches maximum lift thickness for fill and backfill in confined areas to be compacted using equipment smaller than specified for areas 15 feet or more wide under section 2.02 A).
- D. Moisture Condition the fill so that its actual moisture content is within two percentage points of the Optimum Moisture content.
- E. Compact each lift of fill Material using at least three and as many additional complete, overlapping

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coverages by the Compaction Equipment as necessary to achieve an actual dry density of at least 98 percent of the (Standard Proctor) Maximum Dry Density.

- F. Operate Compaction Equipment at a speed no greater than a slow walk and otherwise in accordance with the manufacturers' recommendations for the characteristics of the Soil or Aggregate being used.
- G. Cooperate with the Engineer as he observes the compaction process and performs in place density tests to measure the in place density of each compacted lift at a frequency of approximately one test per 2,000 square feet of surface area.
- H. Scarify, moisture condition and recompact any zone of any lift that does not exhibit a density at least equal to that specified.
- I. Place succeeding lifts, following these Specifications, only after the entire lift exhibits at least the specified density.
- J. Remove and replace or scarify, moisture condition and recompact all fill which experiences saturation, desiccation, freezing or deterioration due to traffic.
- K. Use alternative material or placement and compaction procedures if the fill is unstable, weaves under the tires or tracks of construction equipment or exhibits characteristics that would reasonably be expected to cause poor performance of the fill or supported structures.

3.04 GRADING

- A. Place Fill to at least the elevation indicated on the Drawings.
- B. Trim all cut and compacted surfaces to within 0.05 feet of the elevation indicated on the Drawings.

3.05 BACKFILL

- A. Place Soil and Aggregate Materials for Backfill in lifts no less than three inches thick and no more than six inches thick, loose measure.
- B. Place backfill on both sides of footings, buried walls and utilities so that there is no more than an eight inch difference in fill height on opposite sides of the structure.
- C. Place backfill simultaneously with adjacent fill where practical to do so.
- D. Use Compaction Equipment specified for areas less than 15 feet wide to compact backfill within six feet of structures.

3.06 DRAINAGE COURSE, SUBBASE, BASE

- A. Place Soil and Aggregate Materials for Drainage Course, Subbase and Base in lifts no less than three inches thick and no more than six inches thick, loose measure.
- B. Compact Soil and Aggregate Materials for Drainage Course, Subbase and Base using six complete, overlapping passes of the Compaction Equipment specified for the width of the zone being compacted.
- C. Thoroughly moisten but do not saturate Base Material to receive Portland cement concrete footings,

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slabs and pavement immediately prior to concrete placement. Wherever a vapor barrier is used follow the requirements of the manufactures or at a minimum ASTM E 1643 for placement, protection, and repair of the vapor retarder (as needed).

- D. Notify the Engineer at least 24 hours prior to the placement of any concrete footings or slabs and obtain his acknowledgment that the surface is prepared to receive concrete.

3.07 COHESIVE FILL

- A. Place Soil Materials for Cohesive Fill in lifts no less than three inches thick and no more than six inches thick, loose measure. Place backfill on both sides of footings, buried walls and utilities so that there is no more than an eight inch difference in fill height on opposite sides of the structure
- B. Place Soil Materials for Cohesive Fill around storm water management facilities in lifts no greater than six inches loose measure.
- C. Compact each lift of Cohesive Fill Material using at least three and as many additional complete, overlapping coverages by the Compaction Equipment as necessary to achieve an actual dry density of at least 90 percent of the (Standard Proctor) Maximum Dry Density.

3.08 FIELD QUALITY CONTROL

- A. Control quality of Work in progress and completed Work.
- B. Contractor shall provide independent observation and testing services.
- C. Cooperate with independent observation and testing services.

3.09 PROTECTION

- A. Protect stockpiles from saturation by grading stockpile surfaces to drain and rolling those surfaces with a smooth drum roller, by covering stockpiles with plastic sheeting or other measures adequate to maintain the stockpiled material in a condition suitable for the intended use.
- B. Protect fills in progress from saturation by maintaining a positive slope on the fill surface and by rolling the fill surface with a smooth drum roller at the end of each day of operation and whenever precipitation is predicted.
- C. Protect footing Subgrade from saturation and physical disturbance by placing a lean concrete mudmat if adverse weather conditions are likely to occur. Note that this measure may not protect Subgrade from deterioration due to freezing.

END OF SECTION

SECTION 311000  
SITE PREPARATION - CLEARING, GRUBBING, AND TOPSOIL REMOVAL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals necessary to complete the work specified herein and shown on the Drawings. The work shall include, but not be limited to:
  - 1. Clearing and grubbing the limits shown on the Drawings of trees, tree roots, brush, and incidental debris in the limits required for construction;
  - 2. Chipping all cleared brush and small trees;
  - 3. Stripping topsoil from work areas;
  - 4. Transporting the topsoil to stockpiles at locations approved by the OWNER
  - 5. Stabilizing the topsoil stockpiles.

1.02 DEFINITIONS

- A. Structures and Surface Features: Existing structures and surface features including signs, posts, fences, trees, shrubs, landscaped surface features, and other miscellaneous items.
- B. Utilities: Existing gas mains, water mains, steam lines, electric lines and conduits, telephone and other communication lines and conduits, sewer pipe, cable television, other utilities, and appurtenances.
- C. Clearing and Grubbing: Cutting and disposing of trees, brush, windfalls, logs, and other vegetation, and removing and disposing of roots, stumps, stubs, grubs, logs, and other timber.
- D. Salvaged Topsoil: Natural loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils available from overlying portions of areas to be excavated for construction.
- E. Hard Fill: Crushed concrete, block, brick and inert materials resulting from demolition. Hard fill does not include wood, gypsum wall board, or putrescible material of any type.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials to be cleared and grubbed include trees, roots, shrubs, and any debris or other foreign matter that is neither topsoil nor suitable for backfill, as determined by the Engineer.
- B. Topsoil shall be that of surface material consisting of organic soils that typically occurs at the site to a depth of approximately 4 inches beneath ground surface.
- C. Seed, mulch and erosion control measures shall be as specified in Sections 312500.13, 312500.16 and 329119.

SECTION 311000  
SITE PREPARATION - CLEARING, GRUBBING, AND TOPSOIL REMOVAL

PART 3 EXECUTION

3.01 PREPARATION

- A. Provide three (3) working days notice to owners of existing utilities, structures, and surface features prior to beginning construction.
- B. Provide protection and support during construction for existing utilities, structures, and surface features.
- C. Remove obstructions such as mounds of dirt, stone or debris located within limits of construction. Obstructions such as culverts, end walls, signs, fencing, etc., may be removed if replaced when need for removal is completed. Replace to original condition.

3.02 CLEARING AND GRUBBING

- A. Clearing and grubbing shall only be performed in areas identified within the limits of disturbance on the Drawings and as directed and approved by the OWNER. Appropriate erosion and sedimentation controls shall be in place before the start of clearing, as described in Section 312500.13 and 312500.16.
- B. Do not remove or cut down trees unless located within limits of excavation as indicated on Drawings. Obtain ENGINEER's approval for all shrubs and trees to be removed.
- C. Do not trim trees unless located within easements or rights-of-way shown on Drawings. Cut interfering tree roots and branches 1 in. or greater in diameter perpendicular to direction of growth on tree side of trench.
- D. If weather conditions are unsuitable for clearing and grubbing, as determined by the OWNER, CONTRACTOR shall cease operations until permission to resume operations is obtained from the OWNER.
- E. The CONTRACTOR shall clear and maintain all areas required for access to and execution of work.
- F. Grubbing shall consist of the removal and disposal of stumps, roots, and debris from the work area(s) as shown on the Drawings. The CONTRACTOR shall remove grubbed material from the site. Dispose of materials removed by clearing and grubbing in accordance with applicable Local, State and Federal regulations.
- G. The CONTRACTOR shall protect all existing structures and all utilities which are to remain. CONTRACTOR shall be liable for any and all damages caused by clearing and grubbing operations.

SECTION 311000  
SITE PREPARATION - CLEARING, GRUBBING, AND TOPSOIL REMOVAL

3.03 TOPSOIL REMOVAL

- A. Topsoil may be removed from the areas within the limits of disturbance as indicated on the Drawings upon request by the CONTRACTOR and approval by the Engineer. The depth of topsoil removal shall be determined by CONTRACTOR conducted testing and evaluation of the soils encountered and approved by the Engineer.
- B. Before stripping or removing topsoil, the CONTRACTOR shall mow or otherwise remove all heavy grass, weeds, or other vegetation over areas from which topsoil is to be removed. The Engineer shall determine whether excessive vegetation is present prior to any stripping operations. Appropriate erosion and sedimentation controls shall be in place before the start of topsoil removal, as described in Section 312500.13, 312500.16 and 329119.
- C. Equipment and methods of operation employed shall be chosen with the intent of avoiding lifting subsoil or other unsuitable material.
- D. Strip stockpile areas of vegetation prior to stockpiling.
- E. Stripped topsoil shall be free from clay, stones, vegetation, and debris.

3.04 TOPSOIL STOCKPILING

- A. The CONTRACTOR shall keep topsoil separate from other excavated materials. Topsoil shall be completely removed to the required depth from the designated area before beginning excavation or fill placement work in the area. Topsoil shall not be removed to a depth greater than directed by the Engineer.
- B. Topsoil shall be stockpiled on well drained land in an area identified by CONTRACTOR and acceptable to the OWNER. Topsoil shall be placed in stockpiles of neat conformations and having side slopes no steeper than 4H:1V. The surface of each topsoil stockpile shall be shaped and tracked at the end of each working day.
- C. The topsoil stockpiles shall be isolated by surrounding them with silt fence.

3.06 EXCESS MATERIAL

- A. The CONTRACTOR shall at the CONTRACTOR's expense:
  - 1. Stockpile excavated material suitable for backfill on site.
  - 2. Place material as ordered by ENGINEER on-site.
  - 3. Remove material not required by OWNER from the Site and provide for proper disposal meeting all Local, State, and Federal regulations.

END OF SECTION

SECTION 311000  
SITE PREPARATION - CLEARING, GRUBBING, AND TOPSOIL REMOVAL

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SECTION 312316  
TRENCHING & EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

- A. The CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment to perform all trenching and excavation as well as backfill placement and compaction as specified herein and as shown on the Drawings. Work of this section includes, but is not necessarily limited to:
1. Trenching for the installation of sewer and water lines
  2. Trenching for the installation of sewer force main
  3. Trenching for the installation of culverts
  4. Trenching for the installation of electrical and instrumentation conduit
  5. Excavation for the installation of all cast-in-place and pre-cast structures
  6. Excavation for the construction of stormwater systems
  7. Excavation of unsuitable material
- B. The CONTRACTOR shall also furnish all labor, materials, tools, supervision, transportation, and installation equipment for sheeting, shoring, and bracing, dewatering, maintenance of existing utilities, providing temporary water service, disposal of excess materials and clean up of the site.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM), and "Standard Specifications, Construction and Materials", New York State Department of Transportation, latest edition.

1.3 DEFINITIONS

- A. Unsuitable Material: Topsoil, peat, organic soils, and materials containing slag, cinders, foundry sand, debris, and rubble or soil with less than required bearing capacity as determined by ENGINEER.
- B. Hard Material
1. Weathered rock, dense consolidated deposits, including conglomerate materials which are not included in definition of "rock" but which usually require use of heavy excavation equipment, ripper teeth or jack hammers for removal.
  2. Material identified as having standard penetration resistance, as determined by ASTM D1586, between 60 and 600 blows/ft defined as "hard material".
- C. Pipe Zone
1. Pipe Zone extends from the base of the trench excavation (a minimum of 6 inches below the bottom of the pipe) to a minimum elevation as shown on the Contract Drawings above the crown of the pipe.



SECTION 312316  
TRENCHING & EXCAVATION

1.4 QUALITY ASSURANCE

A. Testing:

1. Laboratory Testing

Testing shall be performed by the CONTRACTOR and at CONTRACTOR's expense by a third party soils testing laboratory approved by the ENGINEER. The CONTRACTOR shall collect and have tested (1) set of samples for each of the soil materials per the table below that summarizes testing requirements for each soil source. Testing methods are as follows:

- a. Standard Proctor Moisture-Density Relationship as described by ASTM D-698
- b. Sieve Analysis as described by ASTM D-422
- c. Freeze Thaw Analysis as described by NYS DOT Method 208

All tests shall be performed in accordance with this specification and shall be completed prior to use on site. Results should be submitted to the ENGINEER for approval 7 days prior to commencing work. The following table summarizes the required analyses for each of the soil materials.

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**Table 1. Aggregates**

Aggregate Type	NYS DOT Requirements	ASTM D-698	ASTM D-422	NYS DOT Method 208	Intended Use (AOBE)
Select Granular Fill (Structural Fill)	NYS DOT 203-2 (C)	<b>X</b>	<b>X</b>	<b>X</b>	Trench backfill, tank subbase, pipe bedding, general backfill
Controlled Low Strength Material (Flowable Fill)	NYS DOT 204-2			<b>X</b>	Separation between buried piping AOB
Screened Gravel Type 4	NYS DOT 304-2 Type 4	<b>X</b>	<b>X</b>		Asphalt subbase beneath all roads, parking and driveways. Interior backfill below slabs
Crushed Stone # 2	NYS DOT 623.12 # 2		<b>X</b>	<b>X</b>	Drainage, pipe bedding, building and structure foundation
Crushed Stone # 1	NYS DOT 623.12 #1		<b>X</b>	<b>X</b>	Drainage, pipe bedding, building and structure foundation
Light stone fill	NYS DOT 620-2.02 - light		<b>visual</b>	<b>X</b>	Slope protection
Medium stone fill	NYS DOT 620-2.02 - medium		<b>visual</b>	<b>X</b>	Slope protection
Heavy stone fill	NYS DOT 620-2.03		<b>visual</b>	<b>X</b>	Slope protection

**Table 2. Gradation Requirements – Percentage by Weight Passing the following Square Openings**

Aggregate Type	4" (100 mm)	3" (75 mm)	2- 1/2" (63 mm)	2" (50 mm)	1- 1/2" (37.5 mm)	1" (25 mm)	1/2" (12.5 mm)	1/4" (6.3 mm)	1/8" (3.2 mm)	No. 40 Sieve (425 µm)	No. 80 Sieve (180 µm)	No. 200 Sieve (75 µm)
Select Granular Fill	100	-	-	-	-	-	-	-	-	0-70	-	0-15
Screened Gravel Type 4	-	-	-	100	-	-	-	30-65	-	5-40	-	0-10
Crushed Stone # 2	-	-	-	-	100	90-100	0-15	-	-	-	-	0-1.0
Crushed Stone #1	-	-	-	-	-	100	90-100	0-15	-	-	-	0-1.0

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**Table 3. Stone Filling Gradation Requirements**

Stone Filling Item	See Notes	Stone Size <sup>1</sup>	Percent of Total by Weight	For Contract
Fine	2, 3, 4	Smaller than 200 mm	90 - 100	N/A
		Larger than 75 mm	50 - 100	
		Smaller than 2.0 mm	0 - 10	
Light	2, 3, 4	Lighter than 50 kg	90 - 100	
		Larger than 150 mm	50 - 100	
		Smaller than 12 mm	0 - 10	
Medium	2, 4	Heavier than 50 kg	50 - 100	
		Smaller than 150 mm	0 - 10	
Heavy	2, 4, 5	Heavier than 300 kg	50 - 100	
		Smaller than 150 mm	0 - 10	

Notes:

1. Stone sizes, other than weights, refer to the average of the maximum and minimum dimensions of a stone particle as estimated by the engineer.
2. Materials shall contain less than 20 percent of stones with a ratio of maximum to minimum dimension greater than three.
3. Air-cooled blast furnace slag, cobbles, or gravel having at least one fractured face per particle are acceptable substitutes for stone under these items, provided that the soundness and gradation requirements are met.
4. Materials shall contain a sufficient amount of stone smaller than the average stone size to fill in the spaces between the larger stones.
5. Heavier gradings of this item may be required on some projects, in which case the requirements will be stated on the plans or in the proposal.

2. During Construction Testing

The OWNER will perform field quality assurance testing of all soil placement operations. Specifically, the OWNER will perform in place density and moisture testing using a nuclear density gauge as described by ASTM D-2922/3017. Density/moisture testing will be performed on Select Granular Fill, Subbase, Unclassified Backfill and Pipe Bedding materials at a frequency as required per this specification or as required by the ENGINEER in the field.

Additionally, the ENGINEER will perform visual inspections for gradation on the light and medium stone fills as well as for the rip rap.

Additional testing will be used at the discretion of the ENGINEER when visual observations indicate a change in the material or the construction performance. If a defective area is discovered, the ENGINEER will immediately determine the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, the ENGINEER will determine the extent of the defective area by additional tests, observations, a review of records, or other means that the ENGINEER deems appropriate. If the defect is related to adverse site conditions ENGINEER will define the limits of the defect and consult with the OWNER.

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3. Frequency

Laboratory Analysis:

- a. The CONTRACTOR shall collect and have tested (1) set of samples for each of the soil materials for each soil source.
- b. Additional sampling will be used at the discretion of the ENGINEER when visual observations indicate a change in the material or the construction performance.

During Construction (Moisture/Density Testing)

- a. One per 500 LF per lift for pipe bedding and select granular fill in pipe trenches
- b. One per 2,000 square feet area per lift (minimum one per test area) for slab-on-grade and pavement construction
- c. One per isolated excavation per lift, and
- d. One per 4,000 cubic yards of fill

B. Sheeting, Shoring, and Bracing:

1. Sheeting, shoring, and bracing shall be designed by a Professional ENGINEER registered in the State of New York.
2. Sheeting, shoring, and bracing shall conform to safety requirements of federal, state, or local public agency having jurisdiction over such matters. Most stringent of these requirements shall apply.

1.5 SUBMITTALS

- A. The CONTRACTOR shall submit the following information and samples to the ENGINEER a minimum of 14 days prior to starting construction of each soil component.
  1. The proposed material source.
  2. Laboratory test data in conformance with the requirements of Part 2.01.
  3. A 10-pound sample of the proposed stone material for the ENGINEER'S use.
- B. The CONTRACTOR shall notify the ENGINEER in writing a minimum of 7 days prior to starting construction of any soil component. The notice shall state the material to be used, the equipment to be used, the date and time that placement operations will start, the name of the person in the field who will be in charge of this construction.
- C. Shoring, Bracing, and Sheet Piling Construction Procedures and Details: If CONTRACTOR elects to use sheeting, shoring, or bracing, CONTRACTOR shall prepare a detailed shop drawing showing the sheeting, shoring, or bracing to be used. Sheeting, shoring, and bracing shall be designed and stamped by a Professional ENGINEER licensed in New York State. ENGINEER will review submitted material to ascertain effect on new construction. ENGINEER will not review shoring, bracing, and sheeting for structural integrity or effect on existing facilities.

1.6 PROJECT/SITE CONDITIONS

- A. Do not block or obstruct sidewalks or pavements with excavated materials, except as authorized by the ENGINEER. Trim banks to minimize inconvenience to public travel.

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B. Sheeting, Bracing, and Shoring:

1. Sheeting, shoring, and bracing shall conform to safety requirements of federal, state, or local public agency having jurisdiction over such matters. Most stringent of these requirements shall apply.
2. Sheeting, shoring, and bracing shall not affect structural integrity of new construction, water tightness or waterproofing of new construction, and shall allow for sufficient clearances necessary to install associated appurtenances adjacent to new construction.
3. When close sheeting required, drive to prevent soil from entering trench below or through such sheeting.
4. Fill voids remaining after sheeting pulled with sand or other approved material.

C. Trenching, Backfilling, and compacting within influence zone of existing or future structures shall be in accordance with this Section.

PART 2 PRODUCTS

2.1 Aggregate and fill materials used in construction shall conform with the following requirements:

- A. Select Granular Fill - NYS DOT 203-2 – To be used as structural fill under structures and as pipe bedding
- B. Controlled Low Strength Material (CLSM) – NYS DOT 204-2 - To be utilized at pipe crossings AOB
- C. Screened Gravel Type 4 – NYS DOT 304-2 Type 4 – To be utilized as subbase under all asphalt and as fill under interior slabs
- D. Crushed Stone # 2 – NYS DOT 623.12 # 2 – To be utilized for base underneath all structures and as pipe bedding
- E. Crushed Stone # 1 – NYS DOT 623.12 # 1 - To be utilized for base underneath all structures and as pipe bedding
- F. Light Stone Filling – NYS DOT 620.03
- G. Medium Stone Filling – NYS DOT 620.04
- H. Heavy Stone Filling – NYS DOT 620.05
- I. Acceptable Earth Fill (Unclassified Earth Fill)  
May be used upon approval from ENGINEER for fill in areas not under nor adjacent to structures, sidewalks or roadways: Acceptable Earth Fill may be excavated materials which are clean, consisting of earth, loam, sandy clay or other material approved by the ENGINEER in the field. Acceptable Earth Fill shall be free of large clods, pavement, broken pipe, concrete rubble or other debris, rock or boulders greater than 4" in diameter and soils containing vegetable or organic matter such as muck, peat, organic silt or any other deleterious matter.

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2.2 GEOTEXTILE

- A. Non-Woven shall be Mirafi 140N or equal.
- B. Woven shall be Mirafi 600X or equal

2.3 SHEETING, SHORING, AND BRACING

- A. Type, design, and installation of shoring, sheeting, and bracing shall be determined by and sole responsibility of CONTRACTOR.

PART 3 EXECUTION

3.1 PREPARATION

- A. CONTRACTOR shall locate all existing utilities and conduct exploratory excavations AOE to verify the location and elevations of existing utilities. Final submittals and pipe purchases shall not occur until this work is complete.
- B. CONTRACTOR shall layout the locations of all proposed structures and pipelines using stakes or paint, taking into account all existing utilities as determined from the utility verification process. Layout is subject to the approval of the ENGINEER. Final location of lines shall be verified at the time of construction by the ENGINEER.
- C. All equipment necessary and required for trenching, laying utility lines and appurtenances, backfilling, compaction and restoration shall be on the project before construction of this item shall be permitted to begin.
- D. CONTRACTOR shall provide timely notification in writing to all corporations, companies, individuals or authorities owning above or below ground conduits, wires, pipes or other utilities running to property or encountered during excavating operations.
- E. CONTRACTOR shall protect work in progress from unnecessary erosion or saturation. If CONTRACTOR's action or failure to act results in on-site materials becoming unacceptable for use, the CONTRACTOR shall remove unacceptable fills and provide acceptable fill as directed by the ENGINEER and at no cost to the OWNER.
- F. Cap or remove and relocate services as required by the Contract.
- G. Protect, support, and maintain conduits, wires, pipes, or other utilities that are to remain as required by OWNER.

3.2 EXAMINATION

- A. Proof-roll and examine subgrades and surfaces to receive fill within influence zone to determine existence of soft areas, areas loosened by frost action or softened by flooding, groundwater or weather or existence of unsuitable materials.
- B. Where sensitive soils are encountered, requirement for proof-rolling shall be waived, and CONTRACTOR shall perform alternate field testing to determine existence of soft areas.

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- D. Compaction requirements shall be 90% of the maximum dry density as determined by ASTM D-698 Standard Proctor with the exception of areas which will be under any structures. All areas which will have structures installed shall be compacted to 95% of the maximum dry density and determined by ASTM D-698 Standard Proctor.
- E. Method of alternative testing shall be approved and coordinated with ENGINEER.
- F. Trench stabilization methods for trenching in soft soils are detailed in the Contract Drawings.

3.3 SHEETING, SHORING, AND BRACING

- A. Whenever necessary to prevent caving during excavation and to protect adjacent structures, property, workers, and public; excavations shall be sheeted, shored, and braced.
- B. Where sheeting, shoring, and bracing is required, drive/install to prevent soil from entering excavation below or through sheeting.
- C. Keep sheeting in-place until structure is placed, tested, and backfilled.
- D. Remove sheeting, shoring, and bracing in manner not damaging structure or permitting voids within backfill.
- E. Fill settled areas remaining after sheeting has been pulled with sand or other approved material.

3.4 FILL USAGE

- A. The types and minimum thickness of fill and bedding materials shall be as shown on the Contract Drawings.
- B. On-site cut soil may be utilized as fill (but not as structural fill) if soil meets the criteria as provided in Part 2 of this Specification and has an acceptable moisture content, and contains no deleterious materials as detailed in these specifications.

3.5 SUBGRADE PREPARATION

- A. CONTRACTOR shall fill all settled areas where excavations or trenches were backfilled as well as holes made by demolition, tree removal, and site preparation work.
- B. Remove and replace or recompact natural soils or compacted fill softened by frost, flooding, groundwater or weather as designated by ENGINEER.
- C. Remove frozen soils within influence zone and replace with structural fill.
- D. All subgrade locations shall be proof-rolled by CONTRACTOR and approved by ENGINEER prior placement of fill.

3.6 EXCAVATION

- A. Excavate to elevations and dimensions necessary to complete construction as shown on the Contract Drawings.

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B. Trenching Tolerances:

1. Excavate so pipes, ducts, and conduits can be laid straight at uniform grade, without sags or humps, between elevations shown on Contract Drawings.
2. Trenches for the installation of gravity sewer mains shall be of sufficient depth so that the top of the pipe when installed will not be less than forty eight (48) inches below the surface of the finished grade and not less than sixty (60) inches for force mains. The maximum width for the trench shall be as shown on the plans. Where conditions prohibit excavation to required depth and when approved by ENGINEER, pipe insulation shall be used as approved by the ENGINEER.
3. Excavation for manholes and appurtenances shall be sufficient to leave twelve (12) inches clear space between the structure and the bank, timber, or box which may be used to hold or protect the bank and to compact the backfill properly.
4. Maximum width at surface of ground shall not exceed width of trench at top of pipe by more than 2 ft without permission of ENGINEER, unless specifically shown on Drawings.
5. Minimum trench width shall be as shown on the plans.
6. Excavate electrical duct or conduit trenches as required so top of concrete encasement or top of conduit shall be as shown on Contract Drawings.

C CONTRACTOR shall protect all shade trees, utility poles and private property along the line of the work, and shall provide for the protection of the public.

D. Temporarily support and secure or cap, remove and relocate utility services in accordance with instructions by owners of services.

G. Protect, support, and maintain conduits, wires, pipes, and other remaining utilities in accordance with requirements of owners of said services.

H. Remove and replace or compact natural soils or compacted fills softened by frost, flooding, or weather.

I. Remove unsuitable material from within trenches as ordered by the ENGINEER.

J. Stabilize trench bottom and replace unsuitable material with Pipe Bedding and Filter Fabric as required by the ENGINEER and shown on the Contract Drawings.

I. Trench Dewatering:

1. The CONTRACTOR shall build all drains and do all ditching, pumping, bailing, and all other work to keep the excavation clear of ground water, sewage, or storm water during the progress of the work and until the finished work is safe from injury.
2. Where suitable construction conditions cannot possibly be obtained by other methods, the CONTRACTOR shall install and operate a wellpoint de-watering system to drain the excavation effectively.
3. Wellpoint systems shall be sufficient in size to dewater excavations 24 inches below subgrade and shall be capable of maintaining the water table at such an elevation until the work required to be constructed in the dry is completed and until all structures will be safe from floatation due to high ground water. The CONTRACTOR is fully responsible for all



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such structures. Wellpoint systems shall be designed and supervised by a reputable de-water equipment supplier or contractor. All water pumped or drained from the work shall be disposed of in a manner satisfactory to the ENGINEER, and in accordance with all applicable local, state and federal requirements.

- J. Do not advance excavation of trenches more than 300 ft ahead of completed pipe installation. The ENGINEER reserves the right to control the length of trench to be opened in advance of pipe installation; if, in his opinion, the pipe laying and installation of appurtenances and services are not proceeding fast enough to complete the installation of pipe and backfilling with a reasonable length of time, the opening of additional trench will not be permitted.
- K. Do not excavate for manholes and other structures until scheduled for construction.
- L. Do not excavate within influence zone of existing footings or foundations without prior approval of ENGINEER.
- M. Upon completion of excavation, notify ENGINEER before proceeding with further Work.
- N. Excavation of Rigid Surfacing:
  - 1. Remove width 1 ft beyond anticipated edge of excavation.
  - 2. Saw cut to ensure straight joint.
  - 3. Surface replacement shall match existing surfacing unless otherwise shown on the contract Drawings.
- O. Excavation across Roadways:
  - 1. Excavation, backfill, and surface replacement shall conform to requirements as shown on the Contract Drawings. In no case shall surface replacement edges bear on less than 12-in. of undisturbed soil.
  - 2. CONTRACTOR shall excavate trenches in which to place the new pipelines. The depth and width of excavation shall be as shown on the Contract Drawings.
  - 3. CONTRACTOR shall neatly saw cut all pavement and sidewalks prior to excavation.
    - a. The pavement shall be properly disposed of according to all Local, State and Federal regulations.
  - 4. CONTRACTOR shall place and compact Pipe Bedding to bed the pipe and to cover the pipe to the depth shown on the Contract Drawings above the crown of the pipe (the "Pipe Zone").
  - 5. For Work beneath roadways, CONTRACTOR shall use Select Granular Fill or Controlled Low Strength Material (flowable fill) to backfill the trench from the top of the Pipe Zone to the bottom of the Subbase as shown on the Contract Drawings and AOB.

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6. CONTRACTOR shall place and compact pipe bedding in the Pipe Zone to protect pipes that are subject to damage by abrasion (e.g. PVC pipe), in wet areas, or as ordered by the ENGINEER.
7. For Work beneath roads, CONTRACTOR shall place and compact Screened Gravel Type 4 as the subbase course beneath paved surfaces and structures as shown on the Contract Drawings.
8. CONTRACTOR shall place backfill materials in lifts and compact to achieve the in-place densities specified herein.

3.7 SHEETING AND BRACING

- A. If ordinary open-cut excavation is not possible or advisable, sheeting and bracing shall be furnished and installed in such excavation to prevent damage and delay to the work and to provide working conditions which are safe and acceptable to the New York State Department of Labor. Unless the sheeting and bracing is to remain in place, it shall be removed as the work progresses - in such a manner as to prevent the loosening and caving of the sides of the excavation and to prevent damage to finished work or adjacent structures and property. As soon as it is withdrawn, all voids left by the sheeting and bracing shall be filled with sand, crushed stone, or acceptable granular material and compacted.
- A. Sheeting and bracing shall be installed at all locations shown on the Plans or as ordered by the ENGINEER. However, nothing in these Specifications, nor any failure upon the part of the ENGINEER or the OWNER to order installation of sheeting and bracing, nor any comments regarding the method of sheeting and bracing shall be construed as relieving the CONTRACTOR from full responsibility for the safety and adequacy of such work. The CONTRACTOR shall retain full responsibility for safeguarding the finished work, the workmen, the public, and adjacent property, and shall take whatever measures believed necessary to do so, including sheeting and bracing of excavations, even though such measures may not have been shown or ordered by the ENGINEER.
- B. The CONTRACTOR may elect to use steel sheet piling for its convenience to facilitate construction, to help in de-watering operations, to protect the CONTRACTOR or others from damage to property or bodily harm, or for any other reason; however, an additional payment will not be made for this portion of the work.

3.8 SUBSURFACE OBSTRUCTIONS

- A. In excavating, trenching, laying pipe, and backfilling, care must be taken by the CONTRACTOR not to remove, disturb, or injure other pipes, conduits, cables, or structures, without the permission of the interested utility or the approval of the OWNER. If necessary, the CONTRACTOR shall, at its own expense, sling, shore up, and maintain such structures, in operation and shall repair any damage done thereto within a reasonable time. Repair of damages to such facilities shall be made to the satisfaction of the ENGINEER and the utility.
- B. The CONTRACTOR shall give sufficient notice in writing to the interested utility of its intention to remove or disturb any pipe, conduit, structure, etc., and shall abide by the utility regulations governing such work. In the event sub-surface structures are broken or damaged in the prosecution of the work, the CONTRACTOR shall immediately notify the proper

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authority and shall be responsible for any damage to person or property caused by such damage.

- C. When pipes, conduit, structures, etc. providing service to adjoining buildings are broken during the progress of the work, the CONTRACTOR shall repair them at once at its own expense, or, if preferred by the utility involved, shall pay the utility the proper charges for having such repairs made by the utility's own force. Delays such as would result in buildings being without service overnight or for needlessly long periods during the day will not be tolerated, and the OWNER reserves the right to make repairs at the CONTRACTOR's expense without prior notification. Should it become necessary to move the positions of a pipe, conduit, or structure, it shall be done by the CONTRACTOR in strict accordance with instructions given by the ENGINEER or the utility involved.

3.9 SURFACE OBSTRUCTIONS

- A. CONTRACTOR shall take every precaution to carefully protect all buildings, fences, walls, utility poles, trees, bridges, railroads, and other improvements from injury or damage, and, in the event of damage or removal of any of the foregoing obstructions during the progress of the work, they shall be repaired or replaced in a satisfactory manner (equal or better condition) - at the CONTRACTOR's expense - before final acceptance of the project.

3.10 OBSTRUCTION OF STREETS AND PREMISES

- A. Excavated material shall be kept clear of sidewalks and interfere as little as possible with facility vehicular traffic except where local conditions make other arrangements necessary; in such event, the CONTRACTOR shall receive appropriate instructions from the ENGINEER in writing.
- B. The CONTRACTOR will not be permitted to close both sides of a double roadway street to vehicular travel, except by written permission from the OWNER for a specified period of time. As required and directed by the ENGINEER, the CONTRACTOR shall bridge the trench in a proper and secure manner so as to prevent any serious interruption to travel upon the roadway or sidewalk and to afford necessary access to particular public premises. The cost of all such work must be included in the prices paid for various pay items, and the CONTRACTOR shall receive no extra compensation for this work.
- C. Special care must be taken to give free access to all fire hydrants, water valve boxes and fire alarm boxes.

3.11 PREPARATION OF PIPE FOUNDATION

- A. The bottom of trenches for sewer and water main installation shall be excavated to a minimum depth 6 inches below the bottom of pipe grade. Bedding material shall be installed per the Contract Drawings. If the material in the trench is of such character that a firm foundation for pipe cannot be secured, such material shall be removed to a depth below grade as ordered by the ENGINEER, and the extra excavation replaced with crushed stone as ordered by the ENGINEER and thoroughly compacted to form an unyielding foundation.

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3.12 PLACEMENT OF BACKFILL

- A. The trenches shall not be backfilled until the pipe work and appurtenances have been approved by the ENGINEER. The ENGINEER reserves the right to order any trench or trenches backfilled at any time after the installation of the pipe and appurtenances if, in the ENGINEER's opinion, the particular open trench or trenches constitute a public nuisance.
- B. Do not use frozen material or place fill on frozen subgrade.
- C. Use of Backfill Materials
  - 1. Select Granular Fill: Select granular fill shall be placed to the lines and grades as shown on the plans, as outlined herein and as outlined in the Geotechnical Report. Fill shall be placed in loose lifts that will result in a maximum lift thickness of 8 inches. Each lift shall be compacted using vibratory equipment and shall be compacted to a minimum of 95% of the maximum dry density in all areas beneath structures and 90% of the maximum dry density in all other fill areas as determined by the Standard Proctor according to ASTM D-698.
  - 2. Pipe Bedding: Crushed Stone #1 and #2 shall be used to bed the pipe to the lines and grades as shown on the plans. The Pipe Zone shall be backfilled with select granular fill as shown on the Plans. The Pipe Zone extends from a depth of 6 inches below the invert of the pipe to an elevation shown on the Drawings. Bedding shall be placed in loose lifts that will result in a maximum lift thickness of 8 inches. Each lift shall be compacted using vibratory equipment and shall be compacted to a minimum of 95% of the maximum dry density as determined by the Standard Proctor according to ASTM D-698.
  - 3. A minimum of twelve (12) inches of Screened Gravel Type 4 material will be required under all roads as shown on the plans. Driveways, sidewalks, curbs or other structures or utilities requiring firm support shall be installed as shown on the plans. Subbase material shall be compacted using vibratory equipment and placed in lifts and thoroughly compacted in a manner approved by the ENGINEER.
  - 4. Hand grade and rake bottom of trench to establish uniform trench gradient.
  - 5. Excavated materials which are clean, consisting of earth, loam, sandy clay or other material approved by the ENGINEER in the field (Acceptable Earth Fill) may be used by the CONTRACTOR to backfill the trench excavation from the top of the Pipe Zone to the bottom of the subbase fill for work beneath all roads. Acceptable Earth Fill shall be free of large clods of earth, debris, pavement, abandoned pipe, structures or trash, rock or boulders over 4" diameter and soils containing vegetable or organic matter such as muck, peat, organic silt or any other deleterious matter.
  - 6. All other stone materials shall be placed in a maximum 9 inch loose lift and compacted as necessary using reasonable means as approved by the ENGINEER.
- D. Where pipes or electrical ducts cross, protect piping or ducts at higher elevation by backfilling trench within higher pipe or duct influence zone down to bedding of lower pipe or duct with #1 and #2 stone or with flowable fill when directed by the ENGINEER.

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- E. Where pipes or electrical ducts leave structures, protect by backfilling pipe or duct influence zone down to undisturbed soil with structural or controlled fill.
- F. Do not backfill until new concrete have properly cured, coatings approved and required tests accepted.
- G. Place fill simultaneously on both sides of free-standing structures.
- H. Provide mechanical compaction for cohesive material and vibratory compaction for granular materials. When approved by ENGINEER, jetting, flooding, puddling or vibroflotation methods may be used for compacting if CONTRACTOR furnishes test results to confirm required degree of compaction being obtained uniformly throughout entire mass.
- I. The trenches shall be backfilled with the materials specified on the Contract Drawings. The material shall be carefully placed in the trench so as not to move the pipe and compacted as specified below. Compactive effort is subject to the approval of the ENGINEER with specific areas requiring added compaction as directed by the ENGINEER.
- J. Backfill materials shall be placed in lifts and compacted to the satisfaction of the ENGINEER. Maximum lift thicknesses and the requirements for compaction are specified herein.

3.13 EXCESS MATERIAL

- A. CONTRACTOR shall at CONTRACTOR's expense:
  - 1. Stockpile excavated material suitable for backfill on site.
  - 2. Place material as ordered by ENGINEER on-site.
  - 3. Remove material not required by OWNER from site and provide for proper disposal.
- B. OWNER has first right to excess excavated material suitable for backfilling or site grading, not required at job site.

3.14 MAINTENANCE

- A. The CONTRACTOR shall maintain all excavated areas by refilling for settlement, until final acceptance of the project in accordance with the applicable articles of the "General Conditions" and other requirements of these Specifications.

3.15 EROSION CONTROL

- A. Conduct site grading and drainage operations to prevent excessive soil erosion from construction site Work area.
- B. Provide means to prevent or minimize movement and washing of soil onto pavements or into adjacent ditches, swales, inlets, and drainage pipes to avoid possibility of drainage structures becoming clogged with soil.
- C. Remove soil and debris from structures, pipes, ditches, and other appurtenances to restore proper functioning.

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- D. Protect water quality in all receiving streams, as required in the Special Conditions Section

3.16 CLEANING UP

- A. The CONTRACTOR shall remove all excess excavated material, rubbish, and debris from adjacent street surfaces, gutters, sidewalks, parking areas, grass plots, highway and railroad rights-of-way, etc., and the project as a whole shall be left in a neat and acceptable condition.

END OF SECTION

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SECTION 312319  
DEWATERING

SECTION 312319 - DEWATERING

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 construction dewatering.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: For dewatering system, prepared by or under the supervision of a qualified professional engineer.
  - 1. Include plans, elevations, sections, and details.
  - 2. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
  - 3. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
  - 4. Include written plan for dewatering operations including sequence of well and well-point placement coordinated with excavation shoring and bracings and control procedures to be adopted if dewatering problems arise.

1.4 FIELD CONDITIONS

- A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from this data.
  - 1. Make additional test borings and conduct other exploratory operations necessary for dewatering according to the performance requirements.
  - 2. The geotechnical report is included elsewhere in Project Manual.



SECTION 312319  
DEWATERING

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
  - 1. Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer.
  - 2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
  - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
  - 5. Remove dewatering system when no longer required for construction.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Provide temporary grading to facilitate dewatering and control of surface water.
- D. Protect and maintain temporary erosion and sedimentation controls during dewatering operations.

SECTION 312319  
DEWATERING

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
  - 1. Space well points or wells at intervals required to provide sufficient dewatering.
  - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.
- C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
  - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 3. Maintain piezometric water level a minimum of 24 inches below bottom of excavation.
- C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.
- D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

3.4 FIELD QUALITY CONTROL

- A. Observation Wells: Provide observation wells or piezometers, take measurements, and maintain at least the minimum number indicated; additional observation wells may be required by authorities having jurisdiction.
  - 1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
  - 2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend

SECTION 312319  
DEWATERING

construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.

3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.
- B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.
- C. Prepare reports of observations.

3.5 PROTECTION

- A. Protect and maintain dewatering system during dewatering operations.
- B. Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION

SECTION 312501  
STRUCTURAL MEASURES FOR EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, installation equipment, and incidentals required to provide structural measures for erosion and sediment control during and upon completion of construction as specified herein and as shown on the Drawings.
- B. The work shall include construction and maintenance of temporary and permanent erosion control structures for those areas shown on the Drawings and all areas disturbed by the Contractor. The work will include, but is not necessarily limited to installation and maintenance of the following structural measures:
  - 1. silt fencing
  - 2. stone check dams
  - 3. culvert inlet protection
  - 4. Erosion control blankets (temporary and permanent)
  - 5. stone & block drop inlet protection
  - 6. curb drop inlet protection
  - 7. grate filters (inlet)
  - 8. HDPE culvert inlet protection
  - 9. Combo silt fence/check dam inlet protection
- C. Contractor is responsible to control all run-off from the work areas

1.02 REFERENCE STANDARDS

- A. All work for this section shall be performed in strict accordance with “New York State Standards and Specifications for Erosion and Sediment Control”, NYSDEC, August 2005 or most recent edition, (i.e., Standards). The Standards are incorporated herein by reference.
- B. Selected materials specified in Section 2.01 below shall meet the material requirements of the “New York State Standards and Specifications for Erosion and Sediment Control”, NYSDEC, August 2005 or most recent edition.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Silt Fence Fabric
  - 1. Silt fence fabric shall be woven and consist of monofilaments of polypropylene treated with ultraviolet light stabilizers. The fabric shall have sleeves through which either steel or 2-inch square wood posts can be inserted.
  - 2. Silt fence fabric shall be inert to chemicals commonly found in soils and to hydrocarbons.
  - 3. Silt fence fabric shall be resistant to mildew, rot, insects, and rodent attack.
  - 4. Silt fence fabric shall conform to the following test criteria:

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STRUCTURAL MEASURES FOR EROSION AND SEDIMENT CONTROL

<u>Property</u>	<u>Unit</u>	<u>Test Method</u>	<u>Minimum Accepted Value</u>
Grab Strength	lbs	ASTM D 1682	90
Elongation at Failure	%	ASTM D 1682	50 (max.)
Mullen Burst Strength	psi	ASTM D 3786	200 (min)
AOS	U.S. Sieve No.	ASTM D 4751	60 - 80
Ultraviolet Stability	%	ASTM D 4355	90
Puncture Strength	lbs	ASTM D 4833	100
Slurry Flow Rate	gal/min/sq.ft	ASTM D 4151	0.3

B. Silt Fence Posts

1. Wood shall be composed of sound quality hardwood with a minimal cross section area of 3.0 square inches.
2. Wood posts shall be a minimum of 36 inches.
3. Steel posts shall be standard T & V section weighing not less than 1.00 pound/linear foot.

C. Check Dams

1. Height shall not greater than two (2) feet. Center shall be maintained nine (9) inches lower than abutments at natural ground elevation.
2. The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam.
3. Stone Size: use graded stone 2 to 15 inches in size. NYSDOT Light Stone Fill meets these requirements.

D. Erosion Control Blankets

1. Temporary biodegradable erosion control blankets for slopes 1:1 and greater shall be North American Green C125BN or equivalent or as specified in the Stormwater Pollution Prevention Plan
2. Temporary biodegradable erosion control blankets for slopes 3:1 and 2:1 shall be North American Green S150 or equivalent or as specified in the Stormwater Pollution Prevention Plan.

~~E. Inlet Protection~~

- ~~1. Refer to Appendix E on standard and specifications.~~

2.02 QUALITY CONTROL

- A. Contractor shall provide manufacturer's certificates for Silt Fence.

PART 3 EXECUTION

3.01 SILT FENCE

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STRUCTURAL MEASURES FOR EROSION AND SEDIMENT CONTROL

- A. Silt fence shall be installed as shown on the Drawings, in the locations shown on the Drawings and down slope of any area before disturbance by construction activities. As shown on the Drawings, the silt fence fabric panels shall be installed loosely with adjacent panels overlapped a minimum of 12 inches. Silt fence material shall be embedded at least 6 in. beneath ground surface and shall extend upward at least 16 in. above the disturbed area ground surface. The top edge of the fabric shall be reinforced or shall have a 1 inch tuck.
- B. Accumulated silt and debris shall be removed by the Contractor from behind the face of the silt fence when the silt deposits reach approximately one third the height of the fence. Clogged or damaged fabric shall be immediately replaced.

3.02 CHECK DAM MAINTENANCE

- A. The check dams should be inspected after each runoff event. Correct all damage immediately. If significant erosion has occurred between structures a liner of stone or other suitable material should be installed in that portion of the channel.
- B. Remove sediment accumulated behind dam as needed to allow channel to drain though the stone check dam and prevent large flows from carrying sediment over the dam, replace stones as needed to maintain the design cross section of the structures.

3.03 EROSION CONTROL BLANKETS

- A. Installed pursuant to manufactures recommendations.

3.04 INLET PROTECTION

- A. The inlet protection structure should be inspected after each runoff event. Correct all damage immediately.
- B. Remove sediment accumulated behind the inlet protection structure as needed. Replace stones as needed. Check materials for proper anchorage and secure as necessary.

3.06 PROVISIONS FOR EROSION CONTROL DURING CONSTRUCTION

- A. Contractor shall implement erosion control measures around all areas to be disturbed prior to disturbing ground in the area, to the satisfaction of the Owner. The Engineer will routinely inspect erosion control structures to confirm that Contractor is maintaining these features.
- B. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, wastes, fuels, oils, bitumens, and calcium chloride into surface waters. Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion.
- C. The temporary drainage ditches, silt fences, and other erosion and sedimentation control features shall be maintained in the locations shown on the Drawings and at other incidental locations identified by the Owner or Engineer.
- D. Disposal of drainage from the site shall be at a location approved by the Owner. Under no circumstances whatsoever shall drainage be pumped, discharged, or otherwise allowed to leave the site until silt and other sedimentary materials have been removed according to the

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erosion and sediment control measures described in these specifications. Particular care shall be taken to prevent the discharge of unsuitable drainage to wetland areas.

END OF SECTION

SECTION 315000  
EXCAVATION SUPPORT AND PROTECTION

SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

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 temporary excavation support and protection systems.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at project site.
  - 1. Review geotechnical report.
  - 2. Review existing utilities and subsurface conditions.
  - 3. Review coordination for interruption, shutoff, capping, and continuation of utility services.
  - 4. Review proposed excavations.
  - 5. Review proposed equipment.
  - 6. Review monitoring of excavation support and protection system.
  - 7. Review coordination with waterproofing.
  - 8. Review abandonment or removal of excavation support and protection system.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles, and calculations for excavation support and protection system.
- B. Shop Drawings: For excavation support and protection system, prepared by or under the supervision of a qualified professional engineer.
  - 1. Include plans, elevations, sections, and details.
  - 2. Show arrangement, locations, and details of soldier piles, piling, lagging, tiebacks, bracing, and other components of excavation support and protection system according to engineering design.
  - 3. Indicate type and location of waterproofing.
  - 4. Include a written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation.



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1.5 FIELD CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
  - 1. Notify Engineer no fewer than two days in advance of proposed interruption of utility.
  - 2. Do not proceed with interruption of utility without Engineer's written permission.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
  - 1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection according to the performance requirements.
  - 2. The geotechnical report is included elsewhere in Project Manual.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Provide, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads.
  - 1. Contractor Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer.
  - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
  - 4. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

2.2 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
- D. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- E. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

SECTION 315000  
EXCAVATION SUPPORT AND PROTECTION

- F. Tiebacks: Steel bars, ASTM A 722/A 722M.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
  - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Locate excavation support and protection systems clear of permanent construction so that construction and finishing of other work is not impeded.

3.2 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.3 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.
- B. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- C. Cut tops of sheet piling to uniform elevation at top of excavation.

SECTION 315000  
EXCAVATION SUPPORT AND PROTECTION

3.4 TIEBACKS

- A. Drill, install, grout, and tension tiebacks.
- B. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
  - 1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.
- C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.5 BRACING

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
  - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
  - 2. Install internal bracing if required to prevent spreading or distortion of braced frames.
  - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 FIELD QUALITY CONTROL

- A. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.
- B. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.7 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
  - 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.
  - 2. Fill voids immediately with approved backfill compacted to density specified in Section 312000 "Earth Moving."
  - 3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION

## **Division 32**



SECTION 321216  
ASPHALT CONCRETE PAVING

PART 1. GENERAL

1.01 Summary

- A. The CONTRACTOR shall furnish all labor, materials, and equipment necessary to install asphalt concrete paving.
- B. Codes and Standards: Comply with NYSDOT standard specifications, latest edition.
- C. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50°F (10°C), and when temperature has not been below 35°F (1°C) for 12 hrs immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- D. Construct asphalt concrete surface course when atmospheric temperature is above 40°F (4°C), and when base is dry. Binder course may be placed when air temperature is above 30°F (-1°C) and rising.
- E. Transport bituminous mixtures in covered trucks during rainy weather and when air temperature is less than 60°F.
- F. Adjust weight, type, capacity, haul routes, and method of operation of hauling vehicles so no damage results to existing streets, subgrade or base course.
- G. If directed by the Engineer, delay paving until the spring following completion of construction to allow for settling of subgrade.

1.02 Submittals

- A. Contractor to submit source location and certification for Asphalt Mix.
- B. Contractor shall submit Pavement Marking Paint information.

1.03 Testing Services.

- A. Certified Test Reports for Pavement Compaction.

PART 2. PRODUCTS

2.01 ASPHALT CONCRETE PAVING

- A. Type 2 Sub Base - shall meet the requirements for NYSDOTSS Item 304.12.
- B. Binder Course (Type 3) - shall meet the requirements for NYSDOTSS Item 403.13
- C. Top Course (Type 6) - shall meet the requirements for NYSDOTSS Item 403.16.
- D. Temporary Paving shall be Type 3 Binder.

2.02 TACK COAT

- A. The Tack Coat shall be an asphalt emulsion meeting the requirements of NYSDOT Material Designation 702-90.

2.03 PAVEMENT MARKING PAINT

- A. CONTRACTOR shall submit for approval a description of the Pavement Marking Paint and the reflectorized glass beads that will be used to restore pavement marking destroyed or damaged during the work. The paint selected by the CONTRACTOR shall be specifically designed for use as a pavement marking paint and shall be approved by the ENGINEER before use.

PART 3. EXECUTION

### 3.01 GENERAL

- A. CONTRACTOR shall install all paving material in accordance with the provision and procedures as specified in NYSDOT “Standards Specifications for Construction and Material” latest edition. All material shall be installed at the locations and at the thicknesses shown on the Contract Drawings.

### 3.02 PAVEMENT CUTS

- A. All existing pavement edges, prior to placement of new paving, shall be saw cut to neat and smooth lines parallel with the existing street. Areas outside the pay limits shown on the Contract Drawings that are disturbed during construction shall be saw cut perpendicular to the street and squared off at 90 degree angles.

### 3.03 PAVEMENT PREPARATION

- A. Remove loose material from compacted subbase immediately before applying prime coat.
- B. If sufficient time has passed since placement of subbase that base course is rutted, loose or uneven, proof roll prepared surface to check for unstable areas and areas requiring additional compaction. Do not begin paving work until deficient areas have been re-graded and corrected and are ready to receive paving.
- C. Prime Coat
  - 1. Apply at rate of 0.20 to 0.50 gal per sq yd, over compacted subgrade.
  - 2. Apply material to penetrate and seal, but not flood, surface.
  - 3. Cure and dry as long as necessary to attain penetration and evaporation of volatile.
- D. Tack Coat:
  - 1. Apply to contact surfaces of previously constructed asphalt or portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement.
  - 2. Distribute at rate of 0.05 to 0.15 gal per sq yd of surface.
  - 3. Allow to dry until at proper condition to receive paving.
  - 4. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

### 3.04 PLACING MIX

- A. General
  - 1. Place asphalt concrete mixture on prepared surface, spread, and strike-off. Spread mixture at minimum temperature of 225°F (107°C). Place inaccessible and small areas by hand. Place course to required grade, cross-section, and compacted thickness.
- B. Placing
  - 1. Place in strips not less than 10-ft wide, unless otherwise acceptable to ENGINEER.
  - 2. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
  - 3. Grade Control: Establish and maintain required lines and elevations to within 3/8-in.
- C. Joints
  - 1. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.
- D. Rolling

1. General - Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
2. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
3. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
4. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
5. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.

E. Protection

1. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Protect paving from traffic until mixture has cooled.
2. Do not drive track equipment over finished paving. Where necessary protect with wood sheeting.

3.05 FIELD QUALITY CONTROL

A. Pavement Testing

1. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving.
2. Tolerances: In-place compacted thickness shall meet or exceed dimensions specified on the drawings.
3. Surface Smoothness Tolerances: Test finished surface of final asphalt concrete course for smoothness, using 10-ft straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding 1/8-in. tolerance for smoothness.

END SECTION



This section is intentionally left blank.

SECTION 323113  
CHAIN LINK FENCES AND GATES

SECTION 323113 - CHAIN LINK FENCES AND GATES

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. Chain-link fences.
2. Swing gates.
3. Horizontal-slide gates.
4. Privacy slats.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
  - a. Fence and gate posts, rails, and fittings.
  - b. Chain-link fabric, reinforcements, and attachments.
  - c. Accessories: Privacy slats, Barbed wire, Barbed tape.
  - d. Gates and hardware.
  - e. Gate operators, including operating instructions and motor characteristics.

- B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.
3. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
4. Wiring Diagrams: For power, signal, and control wiring.

1.4 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

SECTION 323113  
CHAIN LINK FENCES AND GATES

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
  - 1. Design Wind Load: 100 mph.
    - a. Minimum Post Size: Determine according to ASTM F 1043 for post spacing not to exceed 10 feet for Material Schedule 40 steel pipe.
    - b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.
- B. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
  - 1. Fabric Height: as indicated on Drawings.
  - 2. Steel Wire for Fabric: Wire diameter of 0.192 inch.
    - a. Mesh Size: 2 inches.
    - b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied before weaving.
    - c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.

2.3 FENCE FRAMEWORK

- A. Posts and Rails ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:
  - 1. Fence Height: As indicated on Drawings.
  - 2. Light-Industrial-Strength Material: Group IC-L, round steel pipe.
    - a. Line Post: 2.375 inches in diameter.
    - b. End, Corner, and Pull Posts: 4.0 inches.
  - 3. Horizontal Framework Members: Intermediate, top, and bottom rails according to ASTM F 1043.

SECTION 323113  
CHAIN LINK FENCES AND GATES

- a. Top Rail: 1.66 inches in diameter.
- 4. Brace Rails: ASTM F 1043.

2.4 TENSION WIRE

- A. Metallic-Coated Steel Wire: 0.177-inch- diameter, marcelled tension wire according to ASTM A 817 or ASTM A 824, with the following metallic coating:
  - 1. Type II: Zinc coated (galvanized) by hot-dip process, with the following minimum coating weight:

2.5 SWING GATES

- 1. None
- B. Pipe and Tubing:
  - 1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
  - 2. Gate Posts: Round tubular steel.
  - 3. Gate Frames and Bracing: Round tubular steel.
- C. Hardware:
  - 1. Hinges: 360-degree inward and outward swing.
  - 2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.

2.6 HORIZONTAL-SLIDE GATES

- A. General: ASTM F 1184 for gate posts and sliding gate types.
  - 1. Classification: Type I Overhead Slide.
    - a. Gate Leaf Width: As indicated.
  - 2. Classification: Type II Cantilever Slide, roller assemblies.
- B. Pipe and Tubing:
  - 1. Zinc-Coated Steel:
- C. Overhead Track Assembly: Manufacturer's standard track, with overhead framework supports, bracing, and accessories, engineered to support size, weight, width, operation, and design of gate and roller assemblies.

2.7 FITTINGS

- A. Provide fittings according to ASTM F 626.

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- B. Post Caps: Provide for each post.
  - 1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

2.8 BARBED WIRE

- A. Steel Barbed Wire: ASTM A 121, two-strand barbed wire,
  - 1. Zinc Coating: Type Z, Class 3.

2.9 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, 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 needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

2.10 GROUNDING MATERIALS

- A. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.
  - 1. Connectors for Below-Grade Use: Exothermic welded type.
  - 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
  - 1. Do not begin installation before final grading is completed unless otherwise permitted by Engineer.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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CHAIN LINK FENCES AND GATES

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
  - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
  - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
    - b. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonmetallic grout, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
    - c. Posts Set into Holes in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly at 10 feet o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
  - 1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install

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tension wire in locations indicated before stretching fabric. Retain "Top Rail" Paragraph below if applicable.

- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- I. Intermediate and Bottom Rails: Secure to posts with fittings.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 GROUNDING AND BONDING

- A. Fence and Gate Grounding:
  - 1. Ground for fence and fence posts shall be a separate system from ground for gate and gate posts.
  - 2. Install ground rods and connections at maximum intervals of 1500 feet.
  - 3. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
  - 4. Ground fence on each side of gates and other fence openings.
    - a. Bond metal gates to gate posts.
    - b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a ground rod located a maximum distance of 150 feet on each side of crossing.
- C. Fences Enclosing Electrical Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.
- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
  - 1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.
  - 2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.
- E. Connections:

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1. Make connections with clean, bare metal at points of contact.
  2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  4. Make above-grade ground connections with mechanical fasteners.
  5. Make below-grade ground connections with exothermic welds.
  6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- F. Bonding to Lightning Protection System: Ground fence and bond fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor according to NFPA 780.

END OF SECTION



SECTION 323113  
CHAIN LINK FENCES AND GATES

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SECTION 323310  
CONCRETE SIDEWALKS, CURBS AND GUTTERS

PART 1. GENERAL

1.01 SUMMARY

Under this section, the Contractor shall provide all labor, materials, services, submittals, supervision, equipment, tools, etc., as required to construct new concrete sidewalks, curbs, aprons, gutters, handicapped-access ramps, driveways, walkways, etc., to the lines, grades and thickness shown on the Contract Drawings.

PART 2. PRODUCTS

2.01 MATERIALS

- a. The Portland cement concrete mix shall meet the material requirements and be of the composition to compare with NYSDOT Class A concrete as described in the NYSDOT Standard Specification Section 501. In addition, the mix shall also include 1.5 pounds per cubic yard of fiberglass fibers as manufactured by Fibermesh, Grace or equal.
- b. Wire fabric for reinforcement shall be comparable with the requirements of NYSDOT Section 709-02 and shall be WWF 6x6 – W7 x W7, unless otherwise specified.
- c. Expansion and isolation joint filler shall be preformed, non-staining, and compatible with sealant and primer. Joint filler material shall be closed cell superior grade polyethylene or non-extruding PVC, such as Sonneborn "Vinylfoam", Serviced "Rodofoam 11" by W. R. Grace or equal.
- d. If of a supporting type, (supporting concrete) joint filler material shall be closed cell rigid foam, cork, or non-impregnated fiber board, such as Sonneborn ("Sonoflex Cork", Serviced "Standard Cork" filler by W. R. Grace Co.) or equal. Where sealant is to be applied, the joint filler or backer shall be compatible as a back-up material, with regard to the sealant not bonding to or being stained by the backup. If the joint filler is a material that will bond to the sealant, the polyethylene tape shall be used to cover the back up. The polyethylene shall be a type that will not bond to the sealant. Note that joint fillers shall be held back for sealants where possible.
- e. Expansion joint sealer to be Sikaflex-1CSL for joints ranging from ¼" to ½" in depth and Sikaflex-2C NS/SL for joints greater than ½" in depth.
- f. Concrete sealer (cure and seal) to be applied immediately after final troweling shall be a clear, acrylate-type compound with a minimum of 30% acrylic solids complying with ASTM C-1315 Type I, Class B or ASTM C-309, Type I, Class A and B, Conspec #1-30% Solids (Conspec Marketing & Manufacturing Co, Inc., 636 South 66<sup>th</sup> Terrace, Kansas City, KS 66111) or equivalent.
- g. Formwork, reinforcing bars, backfill, etc. as specified elsewhere.

2.02 SUBMITTALS

The Contractor shall provide the following submittals to the Engineer in accordance with the Standard Specifications:

- a. Concrete mix design certified for NYSDOT use
- b. Manufacturer's technical data and dimensions for expansion joint filler

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- c. Manufacturer's technical data for expansion joint sealer
- d. Manufacturer's technical data for concrete sealer
- e. Concrete cylinder test results

PART 3 EXECUTION

3.01 INSTALLATION

Remove and dispose of existing materials as required to install new work.

Prepare subgrade for new construction as shown on the Contract Drawings and specified elsewhere. The subgrade shall be free from bumps, depressions, standing water, roots organic and deleterious material. The subgrade shall be graded, leveled, and compacted to a smooth surface, parallel to the final surface to a width not less than 6 inches beyond the outside edge of the new sidewalk or curb. Provide and compact backfill for base course.

Place formwork to attain specified width, depth, cross-slope, etc. Install reinforcing steel or wire mesh, when required. Wet base material to a penetration of at least one inch before placing concrete thereon.

Furnish, place, finish and cure concrete per section entitled "Cast-In-Place Concrete". Apply concrete sealer (cure and seal) immediately after final troweling, edging and finishing. Sidewalks to have broom finish and curbing shall have hard troweled/smooth finish.

Sawcut all asphalt and oil and stone driveways at a minimum distance of 12 inches from the back edge (i.e., away from the street) of the proposed new sidewalk, curb or gutter. Remove and dispose of materials to the limits of the sawcut as required to install a minimum of 3 inches of compacted Type 7 hot mix asphalt and provide a smooth transition from the sidewalk to the driveway (i.e., slope from top of sidewalk to tie in with existing driveway to be not greater than 1 percent slope). Provide new Type 7 hot mix asphalt overlay (1" minimum), full driveway width, from the roadway to the street-side edge of the new sidewalk.

Sawcut concrete driveways as required to install the new sidewalk and expansion joints on both sides of the new sidewalk for the full driveway width.

For gravel, stone and unpaved driveways, provide a material which best matches the existing conditions (i.e., Item 4 gravel, crushed stone, run-of-crush, etc.) on both sides of the sidewalk to the depth and limits as required to provide a smooth approach to, over and beyond the new sidewalk.

The cross-slope on the new sidewalk can be increased to a maximum of 1:12 across steep driveways with gradual transition back to the typical 2 percent maximum cross-walk slope on both sides of the driveway.

Curbing at driveways and designated curb cuts shall transition at a 1:12 slope from the typical curb height to provide a 1" high reveal at both sides of, and across the full width of, the driveway, as shown on the Contract Drawings.

Expansion joints, one-half inch in thickness by full depth, shall be provided at all points where the sidewalk abuts buildings, curbs or other permanent structures. Expansion joints shall also be provided at intervals of 20 lineal feet and 30 lineal feet (when measured along the centerline of

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the curb or sidewalk) for sidewalk and curb, respectively. Expansion joint filler shall be placed to set flush with the finished surface of the sidewalk or curb and shall extend full-depth of the concrete pour (i.e., to the granular base material) and shall extend the complete width of the sidewalk and curb. Following concrete curing, the joint filler's perforated ½" deep strip shall be removed and expansion joint sealer installed in accordance with manufacturer's recommendations.

Tooled or sawcut control joints, one inch deep, shall be provided at 5 foot intervals between expansion joints for sidewalk and at 10 foot intervals for curbing.

Additional expansion joints shall be provided at each side of any existing tree which may cause that section to heave at a later date. An approved edging material shall be placed around the outside perimeter of the tree if the tree lies within the sidewalk area, as required to provide a clean and even pour. All utility poles, hydrants, posts, etc. greater than 3 inches in diameter shall be boxed out (i.e., 3 inches beyond the items edge all around) to the sidewalks full pour depth, filled with Type B-4 backfill and compacted, and topped with 2 inches (deep) of compacted Type 7 hot mix asphalt. Other posts/poles less than 3 inches in diameter, valve boxes, water shutoffs, gas shutoffs, etc. will have a Schedule 40 PVC sleeve place around the item, full depth and cut off with final grade.

Install full depth metal or plastic pipe sleeves around all property pins prior to the pour. Damage to or loss of property pin locations will necessitate that the Contractor retain a currently licensed land surveyor to survey, map, and re-establish and field locate property pins at sole expense to the Contractor.

Restore all surfaces, lawns, etc. impacted by Contractor's operation to new or pre-construction condition.

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END OF SECTION

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CONCRETE SIDEWALKS, CURBS AND GUTTERS

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SECTION 329119  
SITE RESTORATION AND LANDSCAPING

PART 1. GENERAL

1.01 SUMMARY

- A. The CONTRACTOR shall be responsible for the complete restoration of all areas affected by the construction operations.
- B. Work performed under this section shall include the furnishing of all labor, tools, equipment and materials necessary to completely restore all public and private property - in all areas disturbed by construction, and in other special areas of the project as may be designated by the ENGINEER or as shown on the plans - to a condition which is equal to or better than what existed prior to start of the contract. Incident restoration work includes, but is not limited to the following: signs-public or private, fencing poles, trees, shrubs and bushes, lawns and gardens, public and private utilities, drainage structures and ditches, retaining walls, foundation, slabs, dams and embankment ponds and similar water bodies.

1.02 QUALITY ASSURANCE

- A. CONTRACTOR shall take a complete set of photographs of all work areas prior to commencing work as required by the Supplemental General Requirements. CONTRACTOR shall supply the ENGINEER with one set of these photographs for documentation purposes including but not limited to restoration work.
- B. The contractor shall provide the ENGINEER with documentation that all material required under this item conforms to contract requirements. The contractor shall provide test results for the topsoil, tickets for seed mix, etc.

1.03 SUBMITTALS

- A. Preconstruction photographs submitted per Supplemental General Requirements.
- B. Documentation and test results for the topsoil, seed mix, lime, and fertilizer that demonstrate conformity with this specification section.

PART 2. PRODUCTS

2.01 MATERIALS

- A. In general, all existing materials removed or disturbed during construction shall be replaced with new materials of the same quantity as those disturbed during construction.
- B. Where existing materials or structures can be reused, such as signs, fencing, etc., the contractor shall carefully remove and replace the existing structures to the satisfaction of the individual owner, utility, and ENGINEER.
- C. Where materials are encountered that are no longer made and cannot be replaced with materials of similar quality, the contractor shall make every effort to preserve and reuse the existing materials.

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2.02 TOPSOIL, PLANTINGS AND SEEDINGS

- A. Topsoil shall be of high quality containing approximately 1/3 humus, 1/3 sand and 1/3 loam. Topsoil shall be uniform and homogenous in composition and shall have a pH range of 6.0 to 7.6.
- B. Lime shall be agricultural limestone containing at least 88% calcium and magnesium carbonates and shall be obtained from quality manufacturers.
- C. Fertilizer shall be standard 10-10-10 fertilizer. Mulch shall be hay or straw free from noxious weeds.
- D. Replacement shrubbery shall be vigorous stock obtained from a reputable nursery of a size and shape to match existing. All replacement shrubbery shall be balled in burlap.
- E. Seed mix for lawns shall be as follows:
  - 1. 60% Kentucky Blue Grass
  - 2. 20% Redtop
  - 3. 20% Perennial Ryegrass
- F. Seed mix for open or wooded areas with slopes of less than one on three shall be as follows:
  - 1. 60% Red Fescue
  - 2. 15% Kentucky Bluegrass
  - 3. 20% Perennial Ryegrass
  - 4. 5% White Clover
- G. Seed mix for open or wooded areas with slopes greater than one on three shall be as follows:
  - 1. 30% Crown Vetch
  - 2. 70% Perennial Ryegrass
- H. Seed mix for stream banks and drainage swales shall be as follows:
  - 1. Tall Fescue (0.5 lbs/1000 square feet)
  - 2. Creeping Red Fescue (0.5 lbs/1000 square feet)
  - 3. Red Top (0.1 lbs per 1000 square feet)
- I. Temporary Seeding Mixture IF: Spring or summer or early fall, then seed the area with ryegrass (annual or perennial) at 30 lbs. per acre (Approximately 0.7 lb./1000 sq. ft. or use 1 lb./1000 sq. ft.). IF: Late fall or early winter, then seed Certified 'Aroostook' winter rye (cereal rye) at 100 lbs. per acre (2.5lbs./1000 sq. ft.).
- J. Hydroseeding of open or wooded areas shall be as approved by the ENGINEER.

PART 3. EXECUTION

3.01 INSTALLATION OF RESTORATION WORK

- A. Structures and plantings to be restored after completion of final grading shall be done in conformance with generally accepted practices skilled in the specific trade, equipment which is properly sized and designed to accomplish the specific task and scheduled to cause the least inconvenience and disruption to the property owner.
- B. CONTRACTOR shall be responsible for completing temporary stabilization to prevent erosion. Such temporary measures shall be included in the lump sum price for this item.
- C. CONTRACTOR is responsible for establishing vegetation on disturbed areas. To accomplish this, CONTRACTOR shall re-seed or replant as necessary and provide fertilizers, lime, or additional soil amendments as may be needed to complete restoration.

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SITE RESTORATION AND LANDSCAPING

- D. All final graded areas shall be approved by the ENGINEER prior to the initiation of the restoration activities.
- E. Seeding shall not be completed after October 15<sup>th</sup> without approval of the ENGINEER.
- F. As work proceeds and prior to seeding, CONTRACTOR shall remove all exposed stones and debris greater than 2 inches from surface of area to be seeded.
- G. Surface structures, which have been removed, shall be regraded with the appropriate backfill material, compacted and properly prepared for the new surface.
- H. Ditch lines shall be regraded and shaped generally to match existing and to provide proper drainage.
- I. Cleaning Up - After final restoration is complete, the contractor shall remove all excess excavated material, rubbish and debris all work areas and grass plots; and the whole shall be left in a neat and acceptable condition.

3.02 RESTORATION OF LAWN AREAS

- A. Lawn areas shall be graded to a depth of 6 inches below existing; removing all rocks, stones or stumps and the subsoil shall be scarified. CONTRACTOR shall supply and place six inches of topsoil over the subsoil so that no ridges or depressions occur. Topsoil shall be hand raked as necessary to blend with existing grades. Fertilizer at a rate of 25 pounds per 1,000 square feet and, if required, limestone shall be worked into the top two inches of topsoil. Seed shall then be spread at a rate of five pounds per 1,000 square feet.
- B. The surface shall then be raked and lightly rolled. Mulch shall then be placed to a depth of two to three inches. The contractor shall care for reseeded areas until final payment is made and until the lawn has reestablished itself.
- C. For slopes greater than approximately 10%, contractor shall supply and place erosion control fabric to aid in establishing grass. Fabric shall be completely bio-degradable within 2-years and shall be placed according to supplier specifications. CONTRACTOR shall include up to 5000 square feet of such mat for placement on site AOB.

3.03 RESTORATION OF OPEN AND WOODED AREAS

- A. Open or wooded areas shall be graded to the grades existing prior to disturbance, fertilized at a rate of 1,500 pounds per acre, limed at a rate of 2,000 pounds per acre, seeded at 70 pounds per acre, and mulched in the same manner as lawn areas. Topsoil will only be required if exceptionally barren soil is encountered.
- B. Sloped areas shall be prepared in the same manner as open or wooded areas using the seed specified for sloped areas.
- C. Shrubbery shall be planted in a pit at least 1-1/2 times the size of the root ball. Backfill for shrubbery shall consist of topsoil, peat moss, and fertilizer in the ratio of 7:1:1/4. All shrubbery shall be watered at the time of planting.



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SITE RESTORATION AND LANDSCAPING

3.04 PLANTING OF TREES SHRUBS AND VINES

- A. Plant Protection:  
Prior to delivery, the trunk, branches, and foliage of the plants shall be sprayed with non-toxic antidesiccant, applied according to the manufacturer's recommendations. This does not apply to state nursery seedlings.
- B. Planting Time:  
Deciduous trees and shrubs: April 1 to June 1 and October 15 to December 15.  
Evergreen trees and shrubs: April 1 to June 1 and September 1 to November 15.
- C. Spacing:  
Plant all trees and shrubs well back from buildings to allow for mature crown size. The following are guides for planning:  
Large trees: 50-60 feet apart.  
Small trees: 20-30 feet apart Columnar species: 6-8 feet apart  
Hedges: 1-4 feet apart  
Shrubs: For clumps, plan spacing so mature shrubs will be touching or overlapping by only 1 or 2 feet.
- D. Site Preparation:
  - 1) Individual sites for planting seedlings can be prepared by scalping the sod away from a 4 foot square area where the seedling is to be planted.
  - 2) All planting beds shall be cultivated to a depth of 8 inches, or chemically treated for weed control. Remove objectionable objects that will interfere with maintenance of site.
- E. Planting:
  - 1) Plants shall be located as shown on plans and/or drawings and, where necessary, located on the site by stakes, flags or other means.
  - 2) The plants shall be set upright in holes.
  - 3) All plants shall be thoroughly watered on the same day of planting. Plants that have settled shall be reset to grade.
- F. Wrapping:  
Immediately after planting, wrap deciduous tree trunks from the bottom to the first limb with a 4 inch wide bituminous impregnated, insect resistant tape or paper manufactured for that purpose. Tie with jute (bag strings) at top and bottom.
- G. Mulching:  
Mulch the disturbed area around individual trees and shrubs with a 4-inch layer of wood chips. Pull woodchips 1 inch away from the base of shrubs to avoid fungus development.

3.05 MOWING

CONTRACTOR shall perform one mowing of all areas restored under the project AOB.

END OF SECTION

## **Division 33**



SECTION 330505  
HYDROSTATIC PRESSURE AND LEAKAGE TESTING

PART 1 – GENERAL

1.01 RELATED SECTIONS

- A. Section 331416 – Ductile Iron Pipe

1.02 REFERENCE

- A. AWWA C600
- B. ASTM F2164

1.03 WORK INCLUDED

- A. Testing of all hydraulic structures, pressure and non-pressure piping for leakage as specified.
  - 1. The CONTRACTOR shall furnish all labor, equipment, test connections, vents, water and materials necessary for carrying out the pressure and leakage tests.
  - 2. CONTRACTOR shall use potable water only.
- B. All testing shall be witnessed by the ENGINEER or OWNER.

PART 2 PRODUCTS

(not used)

PART 3 – EXECUTION

3.01 LEAKAGE TESTS

- A. If vacuum testing can not be performed on the concrete structures, a hydrostatic leakage test shall be performed.
- B. Tanks, vaults, wells and other fluid containing structures, (excluding manholes), shall be tested after backfilling by filling the structure with water to overflowing, or other level as may be directed by the ENGINEER, and observing the water surface level twenty-four hours thereafter.
  - 1. When testing absorbent materials such as concrete, the structure shall be filled with water at least 24 hours before the test is started.
- C. The exterior surface, especially at the construction joint, will be inspected for leakage during and upon completion of the 24-hour test.
  - 1. Leakage will be considered to be within the allowable limits when there is no visible sign of leakage on the exterior surface and where the water surface does not drop except as associated with evaporation.
  - 2. A slight dampness on the exterior wall surface during the test period will not be considered as leakage, except in the case of prestressed concrete structures.

SECTION 330505  
HYDROSTATIC PRESSURE AND LEAKAGE TESTING

3.02 TESTS ON PRESSURE PIPING FOR TRANSPORT OF WATER OR SEWAGE (FORCE MAINS)

A. General

1. The newly constructed water or sewer main shall be pressure tested according to ANSI/AWWA C600, Section 4: Hydrostatic Testing.
2. Take all necessary precautions to prevent dirt, debris, or other foreign material from entering the water or sewer main, services, or appurtenances. Remove such material from the water or sewer main, services or appurtenances at no additional expense to the Contract.
3. Pipelines designed to transport water or sewage under pressure shall be tested hydrostatically and for leakage prior to being placed in service.
4. The length of piping and sections included in the tests shall meet the approval of the ENGINEER, but shall not exceed 1,000 lineal feet.
5. The pipe shall be tested at whichever pressure is greater:
  - 1) 150 psi
  - 2) 1.5 times the working pressure of the pipe - See Contract Plans for Working Pressure.
6. Equipment in or attached to the pipes being tested shall be protected. Any damage to such equipment during the test shall be repaired by the CONTRACTOR at his expense.
7. When piping is to be insulated or concealed in a structure, tests shall be made before the pipe is covered.
8. All fittings, hydrants and appurtenances must be properly braced and harnessed before the pressure is applied. Thrust restraining devices which will become a part of the system must also be tested at the test pressure.
9. CONTRACTOR shall use potable water only. Water for flushing and testing lines shall be provided by the CONTRACTOR.
10. If the line fails the test, the CONTRACTOR shall explore for the cause of the excessive leakage and after repairs have been made the line shall be retested. This procedure shall be repeated until the pipe complies at no additional expense to the Contract and without extension of time for completion of the work.

B. Pressure Test

1. Test pressure shall be as scheduled at 1-1/2 times working pressure or where no pressure is scheduled at 150 psi.
2. Test pressure shall be held on the piping for a period of at least 2 hours, unless a longer period is requested by the ENGINEER.
3. The pressure test passes if the pressure remains within 5 psi of the original pressure.

C. Leakage Test for Ductile Iron and PVC Pipe

1. The leakage test shall be conducted concurrently with the pressure test.
2. The rate of leakage shall be determined at 15-minute intervals by means of volumetric measurement of the makeup water added to maintain the test pressure. The test shall proceed until the rate of leakage has stabilized or is decreasing below an allowable value, for three (3) consecutive 15-minute intervals. After this, the test pressure shall be maintained for at least another 15 minutes.
  - a. At the completion of the test, the pressure shall be released at the furthestmost point from the point of application.
3. All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating tests.
4. Unless the local standards are more stringent, use the following formula for allowable leakage (gph).

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HYDROSTATIC PRESSURE AND LEAKAGE TESTING

$$L \text{ (gph)} = \frac{SD(P)^{1/2}}{133,200}$$

S = Length of pipe tested (feet).

D = Nominal diameter of the pipe, (inches).

P = Average test pressure during the leakage test, (psig).

5. Regardless of the above allowables, any visible leaks shall be permanently stopped.
- D. Leakage Test for HDPE Pipe
  1. The leakage test shall be conducted concurrently with the pressure test.
  2. Shall be tested per ASTM F2164 – Non-Monitored Make-up Water Test
    - a. The test procedure consists of initial expansion phase and test phase.
    - b. Initial expansion phase
      1. Make-up water is added as required to maintain the test pressure for four (4) hours.
    - c. Test phase
      1. The test pressure is reduced by 10 psi.
      2. If the pressure remains steady (within 5 % of the target value) for one (1) hour, no leakage is indicated.
  3. All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating tests.
  4. Any visible leaks shall be permanently stopped.
- E. Leakage Test for PCCP Pipe
  1. The leakage test shall be conducted concurrently with the pressure test.
  2. The rate of leakage shall be determined at 15-minute intervals by means of volumetric measurement of the makeup water added to maintain the test pressure. The test shall proceed until the rate of leakage has stabilized or is decreasing below an allowable value, for three (3) consecutive 15-minute intervals. After this, the test pressure shall be maintained for at least another 15 minutes.
    - a. At the completion of the test, the pressure shall be released at the furthestmost point from the point of application.
  3. All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating tests.
  4. The line will not be accepted until this measured quality is less than 10 gallons per inch of diameter per mile of pipe per 24 hours. All visible leaks must be repaired regardless of the measured leakage.
  5. Regardless of the above allowables, any visible leaks shall be permanently stopped.

END OF SECTION

SECTION 330505  
HYDROSTATIC PRESSURE AND LEAKAGE TESTING

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SECTION 330553  
IDENTIFICATION FOR PROCESS PIPING AND EQUIPMENT

SECTION 330553 - IDENTIFICATION FOR PROCESS PIPING AND EQUIPMENT

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. Equipment labels.
  - 2. Warning signs and labels.
  - 3. Pipe labels.
  - 4. Stencils.
  - 5. Valve tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
  - 1. Material and Thickness: aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
  - 2. Letter Color: Black.
  - 3. Background Color: White.



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4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  5. Minimum Letter Size: 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
  6. Fasteners: Stainless-steel.
  7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number,

2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Red.
- C. Background Color: white.
- D. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- E. Minimum Letter Size: 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- F. Fasteners: Stainless-steel.
- G. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- H. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
  1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
  2. Lettering Size: Size letters according to ASME A13.1 for piping.

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2.4 STENCILS

A. Stencils for Piping:

1. Lettering Size: Size letters according to ASME A13.1 for piping.
2. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

2.5 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

1. Tag Material: aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.3 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

- A. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, on each piping system.
1. Identification Paint: Use for contrasting background.

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2. Stencil Paint: Use for pipe marking.
- B. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
1. Near each valve and control device.
  2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  4. At access doors, manholes, and similar access points that permit view of concealed piping.
  5. Near major equipment items and other points of origination and termination.
  6. Spaced at maximum intervals of 50 feet along each run.
- C. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.

3.5 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

3.6 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 220553

SECTION 331113  
FACILITY DISTRIBUTION PIPING AND VALVES

SECTION 331113 - FACILITY DISTRIBUTION PIPING AND VALVES

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. This Section includes water, sewer, sludge distribution piping, valves, and related components outside the building.
- B. Refer to Drawings for type of pipe and location of use.
- C. EPDM: Ethylene propylene diene terpolymer rubber.
- D. HDPE: High density polyethylene plastic.
- E. PVC: Polyvinyl chloride plastic.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  - 2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.
- D. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.
- E. NSF Compliance:
  - 1. Comply with NSF 14 for plastic potable-water-service piping.
  - 2. Comply with NSF 61 Annex G for materials for water-service piping and specialties for domestic water.

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FACILITY DISTRIBUTION PIPING AND VALVES

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
  - 1. Ensure that valves are dry and internally protected against rust and corrosion.
  - 2. Protect valves against damage to threaded ends and flange faces.
  - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
  - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
  - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:
  - 1. Notify Engineer no fewer than two days in advance of proposed interruption of service.

1.7 COORDINATION

- A. Coordinate connection to water main with utility company and/or Owner.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

- A. Copper Tube: ASTM B 88, Type K, water tube, annealed temper.

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1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
2. Copper, Pressure-Seal Fittings:
  - a. NPS 2 (DN 50) and Smaller: Wrought-copper fitting with EPDM O-ring seal in each end.
- B. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
- C. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.2 DUCTILE-IRON PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
  1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and blue coded stainless-steel bolts.
- B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
  1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  2. Gaskets:
    - a) AWWA C111, rubber.
    - b) Field Lok 350 joint restraint where indicated.
- C. Grooved-Joint, Ductile-Iron Pipe: AWWA C151, with cut, rounded-grooved ends.
  1. Grooved-End, Ductile-Iron Pipe Appurtenances:
    - a. Grooved-End, Ductile-Iron Fittings: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions matching pipe.
    - b. Grooved-End, Ductile-Iron-Piping Couplings: AWWA C606, for ductile-iron-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.
- D. Flanges: ASME 16.1, Class 125, cast iron.

2.3 HDPE PIPE AND FITTINGS

- A. HDPE, AWWA Pipe: AWWA C906, ASTM D 3350, SDR No. 11; with PE compound number required to give pressure rating not less than 160 psig.

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1. PE, AWWA Fittings: AWWA C906, socket- or butt-fusion type, with DR number matching pipe and PE compound number required to give pressure rating not less than 160 psi.

2.4 PVC PIPE AND FITTINGS

- A. PVC, ASTM D 2241, SDR 21, with bell end with gasket, and with spigot end.
  1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Gaskets: AWWA C111, rubber.
  2. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

2.5 SPECIAL PIPE FITTINGS

- A. Ductile-Iron Rigid Expansion Joints:
  1. Description: Three-piece, ductile-iron assembly consisting of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
    - a. Pressure Rating: 250 psi minimum.
    - b. Expansion Required: 6 inches.
- B. Ductile-Iron Flexible Expansion Joints:
  1. Description: Compound, ductile-iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections. Assemble components for offset and expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
    - a. Pressure Rating: 250 minimum.
    - b. Offset: 6 inches.
    - c. Expansion Required: 6 inches.
- C. Ductile-Iron Deflection Fittings:
  1. Description: Compound, ductile-iron coupling fitting with sleeve and 1 or 2 flexing sections for up to 15-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
    - a. Pressure Rating: 250 psi minimum.

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2.6 PIPING SPECIALTIES

- A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- B. Tubular-Sleeve Pipe Couplings:
  - 1. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.
    - a. Standard: AWWA C219.
    - b. Center-Sleeve Material: stainless steel.
    - c. Gasket Material: Natural or synthetic rubber.
    - d. Pressure Rating: 150 psi minimum.
    - e. Metal Component Finish: Corrosion-resistant coating or material.
- C. Split-Sleeve Pipe Couplings:
  - 1. Description: Metal, bolted, split-sleeve-type, reducing or transition coupling with sealing pad and closure plates, O-ring gaskets, and bolt fasteners.
    - a. Standard: AWWA C219.
    - b. Sleeve Material: stainless steel.
    - c. Sleeve Dimensions: Of thickness and width required to provide pressure rating.
    - d. Gasket Material: O-rings made of EPDM rubber, unless otherwise indicated.
    - e. Pressure Rating: 150 psi minimum.
    - f. Metal Component Finish: Corrosion-resistant coating or material.
- D. Flexible Connectors:
  - 1. Nonferrous-Metal Piping: Bronze hose covered with bronze wire braid; with copper-tube, pressure-type, solder-joint ends or bronze flanged ends brazed to hose.
  - 2. Ferrous-Metal Piping: Stainless-steel hose covered with stainless-steel wire braid; with ASME B1.20.1, threaded steel pipe nipples or ASME B16.5, steel pipe flanges welded to hose.

2.7 CORROSION-PROTECTION PIPING ENCASEMENT

- A. Encasement for Underground Metal Piping:
  - 1. Standards: ASTM A 674 or AWWA C105.
  - 2. Form: tube.
  - 3. Material: High-density, crosslaminated PE film of 0.004-inch minimum thickness.
  - 4. Color: black.

2.8 GATE VALVES

- A. AWWA, Cast-Iron Gate Valves:
  - 1. Buried Nonrising-Stem, Resilient-Seated Gate Valves:



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- a. Description: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
  - 1) Standard: AWWA C509.
  - 2) Minimum Pressure Rating: 200 psi.
  - 3) End Connections: Mechanical joint.
  - 4) Interior Coating: Complying with AWWA C550.
- 2. Non- buried OS&Y, Rising-Stem, Resilient-Seated Gate Valves:
  - a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.
    - 1) Standard: AWWA C509.
    - 2) Minimum Pressure Rating: 200 psi.
    - 3) End Connections: Flanged.

2.9 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Tapping-Sleeve Assemblies:
  - 1. Description: Sleeve and valve compatible with drilling machine.
    - a. Standard: MSS SP-60.
    - b. Tapping Sleeve: Cast- or ductile-iron or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
    - c. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.
- B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER" or "SEWER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.
  - 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.
- C. Indicator Posts: UL 789, FMG-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.10 CHECK VALVES

- A. AWWA Check Valves:
  - 1. Description: Swing-check type with resilient seat. Include interior coating according to AWWA C550 and ends to match piping.
    - a. Standard: AWWA C508.
    - b. Pressure Rating: 175 psi.
    - c. External lever with spring

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2.11 BUTTERFLY VALVES

- A. AWWA Butterfly Valves:
  - 1. Description: Rubber seated.
    - a. Standard: AWWA C504.
    - b. Body: Cast or ductile iron.
    - c. Body Type: flanged.
    - d. Pressure Rating: 150 psi.

2.12 PLUG VALVES

- A. Plug Valves:
  - 1. Description: Resilient-seated eccentric.
    - a. Standard: MSS SP-108.
    - b. Body: Cast iron.
    - c. Pressure Rating: 175 psi minimum CWP.
    - d. Seat Material: Suitable for potable-water service.

2.13 CORPORATION VALVES AND CURB VALVES

- A. Manufacturers:
- B. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
  - 1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
  - 2. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
  - 3. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.
- C. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
- D. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.
  - 1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

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FACILITY DISTRIBUTION PIPING AND VALVES

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

3.2 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.
  - 2. Use the following for valves in vaults and aboveground:
    - a. Gate Valves, NPS 3 and Larger: cast iron, OS&Y rising stem, resilient seated.
    - b. Check Valves: AWWA C508 UL/FMG, swing type.

3.3 PIPING INSTALLATION

- A. Make connections larger than NPS 2 with tapping machine according to the following:
  - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
  - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
  - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
  - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- B. Make connections NPS 2 and smaller with drilling machine according to the following:
  - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
  - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
  - 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
  - 4. Install corporation valves into service-saddle assemblies.
  - 5. Install manifold for multiple taps in water main.
  - 6. Install curb valve in water-service piping with head pointing up and with service box.

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- C. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
  - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- D. Install PE pipe according to ASTM D 2774 and ASTM F 645.
- E. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.
- F. Bury piping with depth of cover over top at least 48 inches, with top at least 12 inches below level of maximum frost penetration:
- G. Install piping by drilling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.
- H. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.
- I. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, field LOK gaskets, thrust blocks, anchors, tie-rods and clamps, and other supports for a minimum of three pipe lengths or 60 feet before and after the change in direction.

3.4 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
  - 1. Copper-Tubing, Pressure-Sealed Joints: Use proprietary crimping tool and procedure recommended by copper, pressure-seal-fitting manufacturer.
  - 2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
  - 3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
  - 4. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
  - 5. PE Piping Insert-Fitting Joints: Use plastic insert fittings and fasteners according to fitting manufacturer's written instructions.
  - 6. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.

3.5 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
  - 1. Concrete thrust blocks.

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2. Locking mechanical joints.
  3. Set-screw mechanical retainer glands.
  4. Bolted flanged joints.
  5. Heat-fused joints.
  6. Pipe clamps and tie rods.
  7. Field Lok gaskets.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
  2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
  3. Fire-Service-Main Piping: According to NFPA 24.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.6 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.
- C. MSS Valves: Install as component of connected piping system.
- D. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.7 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
1. Increase pressure in 50-psi increments and inspect each joint between increments. Hold at test pressure for 2 hours; decrease to 0 psi. Maximum allowable leakage is 2 quarts per hour per 100 joints. **Remake leaking joints with new materials and repeat test until leakage is within allowed limits.**
- C. Prepare reports of testing activities.

3.8 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground piping. Locate below finished grade, directly over piping.

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3.9 CLEANING

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
  - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
  - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
  - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
  - d. Repeat water sample 24 hours after collecting the first sample.
  - e. Repeat procedure if any biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION 331113

SECTION 331113  
FACILITY DISTRIBUTION PIPING AND VALVES

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SECTION 331116  
PROCESS PIPING

SECTION 331116 – PROCESS PIPING

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. Ductile-iron pipe and fittings.
  - 2. Galvanized steel pipe and fittings.
  - 3. Stainless-steel piping
  - 4. PVC pipe and fittings.
  - 5. Piping joining materials.
  - 6. Encasement for piping.
  - 7. Transition fittings.

1.3 ACTION SUBMITTALS

- A. Product Data: For pipe and valves.

1.4 FIELD CONDITIONS

- A. Interruption of Existing Systems: Do not interrupt systems to facilities occupied by Owner or others unless permitted under the following conditions:
  - 1. Notify Engineer no fewer than two days in advance of proposed interruption of service.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Refer to the Drawings for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 DUCTILE-IRON PIPE AND FITTINGS

- A. Plain-End, Ductile-Iron Pipe: AWWA C151/A21.51.
- B. Appurtenances for Grooved-End, Ductile-Iron Pipe:



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1. Fittings for Grooved-End, Ductile-Iron Pipe: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions that match pipe.
2. Mechanical Couplings for Grooved-End, Ductile-Iron-Piping:
  - a. AWWA C606 for ductile-iron-pipe dimensions.
  - b. Ferrous housing sections.
  - c. EPDM-rubber gaskets suitable for hot and cold water.
  - d. Bolts and nuts.
  - e. Minimum Pressure Rating: 250 psi

2.3 GALVANIZED-STEEL PIPE AND FITTINGS

- A. Galvanized-Steel Pipe:
  1. ASTM A 53/A 53M, Standard Weight.
  2. Include ends matching joining method.
- B. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106/A 106M, Standard Weight, seamless steel pipe with threaded ends.
- C. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- D. Malleable-Iron Unions:
  1. ASME B16.39, Class 150.
  2. Hexagonal-stock body.
  3. Ball-and-socket, metal-to-metal, bronze seating surface.
  4. Threaded ends.
- E. Flanges: ASME B16.1, Class 125, cast iron.
- F. Appurtenances for Grooved-End, Galvanized-Steel Pipe:
  1. Fittings for Grooved-End, Galvanized-Steel Pipe: Galvanized, ASTM A 47/A 47M, malleable-iron casting; ASTM A 106/A 106M, steel pipe; or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
  2. Fittings for Grooved-End, Galvanized-Steel Pipe:
    - a. AWWA C606 for steel-pipe dimensions.
    - b. Ferrous housing sections.
    - c. EPDM-rubber gaskets suitable for hot and cold water.
    - d. Bolts and nuts.
    - e. Minimum Pressure Rating 250 psi

2.4 STAINLESS-STEEL PIPING

- A. Potable-water piping and components shall comply with NSF 61 Annex G.
- B. Stainless-Steel Pipe: ASTM A 312/A 312M, schedule 10.
- C. Stainless-Steel Pipe Fittings: ASTM A 815/A 815M.

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- D. Appurtenances for Grooved-End, Stainless-Steel Pipe:
  - 1. Fittings for Grooved-End, Stainless-Steel Pipe: Stainless-steel casting with dimensions matching stainless-steel pipe.
  - 2. Mechanical Couplings for Grooved-End, Stainless-Steel Pipe:
    - a. AWWA C606 for stainless-steel-pipe dimensions.
    - b. Stainless-steel housing sections.
    - c. Stainless-steel bolts and nuts.
    - d. EPDM-rubber gaskets suitable for hot and cold water.
    - e. Minimum Pressure Rating 250 psi

2.5 PVC PIPE AND FITTINGS

- A. PVC Pipe: ASTM D 1785, Schedule 40 and Schedule 80.
- B. PVC Socket Fittings: ASTM D 2466 for Schedule 40 and ASTM D 2467 for Schedule 80.
- C. PVC Schedule 80 Threaded Fittings: ASTM D 2464.

2.6 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials:
  - 1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
  - 2. Full-face or ring type unless otherwise indicated.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, stainless steel unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys.
- D. Flux: ASTM B 813, water flushable.
- E. Brazing Filler Metals: AWS A5.8M/A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- F. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
- G. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.7 TRANSITION FITTINGS

- A. General Requirements:
  - 1. Same size as pipes to be joined.
  - 2. Pressure rating at least equal to pipes to be joined.
  - 3. End connections compatible with pipes to be joined.

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- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install ductile-iron piping under building slab with restrained joints according to AWWA C600 and AWWA M41.
- C. Install piping level without pitch and plumb.
- D. Install seismic restraints on piping.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping to permit valve servicing.
- G. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install pressure gages on suction and discharge piping for each plumbing.
- K. Install sleeves for piping penetrations of walls, ceilings, and floors.
- L. Install sleeve seals for piping penetrations of concrete walls and slabs.

3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

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PROCESS PIPING

1. Apply appropriate tape or thread compound to external pipe threads.
  2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Joint Construction for Grooved-End, Ductile-Iron Piping: Make joints according to AWWA C606. Cut round-bottom grooves in ends of pipe at gasket-seat dimension required for specified (flexible or rigid) joint. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.
- E. Joint Construction for Grooved-End Steel Piping: Make joints according to AWWA C606. groove ends of pipe as specified. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts.
- F. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:
1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
  2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  3. PVC Piping: Join according to ASTM D 2855.

3.3 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices.
- B. Comply with requirements for pipe hanger, support products.
1. Vertical Piping: MSS Type 8 or 42, clamps.
  2. Individual, Straight, Horizontal Piping Runs:
    - a. 10 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
  3. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install supports for vertical piping every 10 feet.

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- F. Install hangers for piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. 10 feet with 7/8-inch rod.
- G. Install vinyl-coated hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. 48 inches with 7/8-inch rod.
- H. Install supports for vertical PVC piping every 48 inches.
- I. Support piping and tubing not listed in this article according to MSS SP-58 and manufacturer's written instructions.

3.5 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

3.6 IDENTIFICATION

- A. Label pressure piping with system operating pressure.

3.7 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Piping Inspections:
    - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
    - b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
      - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
      - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
    - c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
    - d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
  - 2. Piping Tests:

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- a. Fill piping. Check components to determine that they are not air bound and that piping is full of water.
  - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
  - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  - d. Cap and subject piping to static water pressure of 50 psi above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
  - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
  - f. Prepare reports for tests and for corrective action required.
- B. Piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.8 ADJUSTING

- A. Perform the following adjustments before operation:
1. Close drain valves, hydrants, and hose bibbs.
  2. Open shutoff valves to fully open position.
  3. Open throttling valves to proper setting.
  4. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
  5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
  6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
  7. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.9 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:
1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
  2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Fill and isolate system according to either of the following:

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PROCESS PIPING

- 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
  - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
  - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
  - d. Repeat procedures if biological examination shows contamination.
  - e. Submit water samples in sterile bottles to authorities having jurisdiction.
- B. Clean non-potable domestic water piping as follows:
1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
  2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.
- D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.10 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

3.11 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
  2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
- B. Use check valves to maintain correct direction of flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION

SECTION 331415  
TAPPED CONNECTIONS

PART 1. GENERAL

1.01 WORK SPECIFIED

- A. Tapping and installing of corporation stops and valves on existing or newly installed pipes without interruption of service.
- B. Connections located as shown on the Contract Drawings or as specified or directed.
- C. Installing of curb stops and boxes where specified or directed.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Pipeline Installation
- B. Gate Valves

1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

- A. American Water Work Association (AWWA)

1.04 SUBMITTALS

- A. Detail drawings for each size corporation stop, curb stop, tapping sleeve and valve, and service box.

PART 2. MATERIALS

2.01 CORPORATION STOPS

- A. Corporation stops shall be threaded to conform to AWWA C800 with standard corporation stop thread at the inlet. The outlet shall be fitted with coupling nut for compression tube service unless otherwise specified.

2.02 CURB STOPS

- A. Curb stops shall be threaded to conform to AWWA C800 with coupling nuts for compression tube service.
  - 1. 3/4 inch shall be of the inverted key type.
  - 2. 1 inch to 2 inch shall be of the plug valve type with "O" ring seals to withstand a minimum working pressure of 175 psi.

2.03 SERVICE SADDLES

- A. Service clamps shall be designed for use on the type of pipe to which the connection is being made.
  - 1. Ductile iron service clamps shall be the double strap type with neoprene gaskets.
  - 2. Polyvinyl chloride pipe service clamps shall be of a full circle design with a minimum width of 2 inches.
  - 3. Prestressed concrete pipe service clamps shall be made by or approved for use by the pipe manufacturer.



SECTION 331415  
TAPPED CONNECTIONS

2.04 SERVICE BOXES

- A. Service boxes shall be constructed of cast iron and sized for the curb stop upon which it is being installed.
  - 1. Stationary shut-off rod shall be provided unless otherwise specified.
  - 2. Boxes shall be telescopic with a minimum of 1 foot adjustment.

2.05 TAPPING SLEEVES AND VALVES

- A. Specifications for stainless steel sleeves
  - 1. Sleeve: ANSI/AWWA C223.
  - 2. Joints: ANSI/AWWA C111, mechanical joint with 125 pound tapping flange, rubber gasket.
  - 3. Bolts: 18-8 Type 304 Stainless Steel.
- B. Tapping sleeves and valves shall be used for connections larger than 2 inches.
  - 1. Tapping sleeves shall be designed and sized in accordance with the recommendations of the manufacturer.
  - 2. Working pressure shall be 150 psi unless higher pressures are scheduled.
  - 3. The seal of the tapping sleeve shall be mechanical joint.
  - 4. Valves for tapping sleeves shall be designed for the intended service and shall conform to the requirements of the Section entitled "Gate Valves".
  - 5. Tapping sleeves and valves shall be manufactured by:
    - a. Smith Blair Model 663
    - b. Approved Equal
- C. Materials
  - 1. Tapping sleeve body and neck shall be made of heavy 18-8 Type 304 stainless steel.
  - 2. The flange shall be 304 stainless steel AWWA Class D and recessed to accommodate tapping valves per MSS-SP-60.
  - 3. The studs shall be 18-8 type 304 stainless steel with NC threads and epoxy coated. The nuts shall be 304 stainless steel, fluoropolymer coated to prevent galling.
  - 4. The gasket shall be ¼" thick, gridded and have a molded outlet ring to ensure effective sealing. The gasket shall be NSF 61 Nitrile (Buna N) for use in water or other fluid applications. The gasket shall have bridge plates made of heavy 302 stainless steel. The bridge plates shall be recessed and bonded into the gasket.
  - 5. All welded stainless steel surface areas shall be fully passivated for maximum corrosion protection.

PART 3. INSTALLATION

3.01 GENERAL

- A. Connections shall be installed by or under the direction of personnel who have performed at least ten similar connections.
  - 1. Threaded taps shall be made using a machine designed for cutting, threading and inserting the corporation without interruption of service.
  - 2. Teflon tape shall be used on corporation threads.

SECTION 331415  
TAPPED CONNECTIONS

- B. Tapping sleeve connections shall be made using a machine to cut and remove the segment through the valve without interruption of service.
- C. Service boxes shall be set plumb and shall be independently supported on two bricks so no weight will be transmitted to the curb stop or carrier pipe.
- D. Service clamps and tapping sleeves installed on prestressed concrete pipe shall be encased in a minimum of 2 inches of concrete mortar after installation.
- E. MAXIMUM SIZE FOR THREADED TAPS

Pipe Material	Pipe size (inches)				
	4	6	8	12	16 & Larger
Ductile Iron					
w/Service Clamp	2	2	2	2	2
w/o Service Clamp	-	3/4	1	1-1/2	2
Polyvinyl Chloride					
w/Service Clamp or prethreaded collar	3/4	1-1/2	2	2	2
w/o Service Clamp	NOT ALLOWED				
Prestressed Concrete					
w/Service Clamp or prefabricated tapped hole	-	-	-	-	2
w/o Service Clamp	NOT ALLOWED				

END OF SECTION

SECTION 331415  
TAPPED CONNECTIONS

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SECTION 331416  
DUCTILE IRON PIPE

PART 1 GENERAL

1.01 SUMMARY

1. Work Specified- Centrifugally cast cement lined ductile iron pipe and fittings of the thickness class as specified in the pipe schedule or as shown on the Contract Drawings.

1.02 RELATED SECTIONS

- A. Section 312000 – Trenching and Excavation
- B. Section 312316.13 – Pipeline Installation
- C. Section 330505.31 – Hydrostatic Pressure and Leakage Testing

1.03 REFERENCES

- A. Applicable Codes, Standards and Specifications
  1. American National Standards Institute (ANSI)
  2. American Water Works Association (AWWA)
  3. American Society for Testing and Materials (ASTM)

1.04 MATERIALS

- A. Ductile Iron pipe and fittings shall comply with the following ANNI/AWWA standards:

Ductile Iron Pipe	C151
Fittings	C110
Joints-Mechanical and Push-On	C111
Joints-Flanged	C115
Cement Lining	C104
Polyethylene Encasement	C105

- B. All piping shall be Class 52. Where pipe rating is reduced by threading, increase pipe weight to Class 53.
- C. All pipe shall be manufactured in the United States and shall be new and of first class materials and construction.
- D. All shipments of material shall be tested in accordance with the provisions for testing in the applicable standards.

1.05 SUBMITTALS

- A. The manufacturer shall furnish sworn statements that all of the specified tests have been made and the results thereof comply with the requirements of the specified standards.
- B. Pipe and joint details.
- C. Layout drawings for Ductile Iron Pipe to be installed within structures showing the location including details of the support system, sleeves and appurtenances.

SECTION 331416  
DUCTILE IRON PIPE

PART 2 PRODUCTS

2.01 PIPE

A. General Requirements

1. All buried Ductile Iron pipe and fittings shall comply with the following standards:

<u>ANSI/AWWA</u>	
Ductile Iron Pipe	C151
Fittings	C110
Joints-Mechanical and Push-On	C111
Joints-Flanged	C115
Cement Lining	C104
Polyethylene Encasement	C105

B. Buried Pipe

1. All buried pipeline scheduled to be ductile iron shall be ductile iron pipe, class 52, cement lined conforming to ANSI/AWWA C151/A21.51 specifications.

C. Interior Pipe -

1. All interior gallery piping shall be ductile iron pipe, class 53 (where threaded) conforming to ANSI/AWWA C115/A21.15 specifications.
2. All interior gallery piping and fittings shall be exterior primed for painting.

D. Manufacturers for Push-on Joint Pipe

1. American Pipe Product: Fastite Joint
2. U. S. Pipe Product: Tyton Joint
3. Griffin Pipe Product: Super Bell-Tite Joint
4. Clow Product: Tyton Joint or Fastite Joint

E. Manufacturers for Mechanical Joint Pipe

1. American Pipe Product: Flex-Ring
2. U. S. Pipe Product: TR FLEX
3. Griffin Pipe Product: SNAP-LOK
4. Clow Product: Restrained Tyton or Restrained Fastite

2.02 CEMENT MORTAR LINING AND BITUMINOUS COATING

- A. AWWA C104.
- B. Thickness: Not less than 1/16 in.
- C. Do not steam cure cement mortar lined pipe and fittings.
- D. Apply bituminous seal coat over cement lining on inside of pipe. Coating shall be smooth, tough, tenacious, and impervious to water without any tendency to scale off and shall not be brittle.

SECTION 331416  
DUCTILE IRON PIPE

2.03 POLYETHYLENE PIPE ENCASEMENT

- A. Shall be 8 mil polywrap film manufactured of 100 % polyethylene material conforming to ASTM D 4976 Group 2 (Linear).
- B. Shall be manufactured in accordance with ANSI/AWWA C105.
- C. Pigmentation
  - a. Natural when exposure to ultraviolet light, such as sun, is less than 48 hours.
  - b. 2.0 to 2.5% well-dispersed carbon black with stabilizers when exposure to ultraviolet light is 2 to 10 days.
- D. Material: Virgin polyethylene produced from Dupont Alathon or USI Petrothene resins.
- E. Method of manufacture: Extruded tube form.
- F. Closure Tape: Polyhen #900 or Scotchrap #50, 2" wide, plastic backed, adhesive tape.
- G. Flat tube widths:

Nominal Pipe Sizes	Push-on Joint Flat Tube Width	Mechanical Flat Tube Width
6"	17"	20"
8"	21"	24"
10"	25"	27"
12"	29"	30"
14"	33"	34"
16"	37"	37"
18"	41"	41"
20"	45"	45"
24"	53"	53"

2.04 FITTINGS

- A. All fittings shall conform to ANSI/AWWA C110/A21.10 specifications.
- B. Buried Pipe Fittings
  - 1. All fittings for buried piping shall have compact ductile iron mechanical joints and shall conform to ANSI/AWWA C111/A21.11 specifications.
  - 2. All fittings for buried pipe shall be cement mortar lined with bituminous coating

2.05 PIPE INSULATION

- A. Pipe Insulation shall be 2" thick Pittsburgh Corning FOAMGLASS insulation or approved equal.
  - 1. Shall include pit wrap with the pipe insulation.
- B. Pipe insulation shall be installed only where as shown on the Contract Drawings and AOB.

2.06 JOINTS

- A. The type of joints for ductile iron pipe and fittings shall be as scheduled in the pipe schedule and/or as shown on the Contract Drawings.

2.07 VALVES

- A. Buried Piping Valves
  - 1. For valve types refer to Sections 15010 and 15015.
  - 2. All valves shall open when turned counterclockwise unless otherwise noted.
  - 3. Valve box shall be slide type and "water" or "sewer" shall be cast on cover.
  - 4. All valves shall be manufactured in United States, and shall be Clow or approved equal.

SECTION 331416  
DUCTILE IRON PIPE

PART 3 EXECUTION

3.01 PIPE INSTALLATION

- A. Trench, backfill, and compact in accordance with Sections 312000.
- B. Restrain piping and fittings at changes of alignment and at dead ends in accordance with pipe restraint details on Contract Drawings.
- C. All ductile iron pipe and fittings shall be handled with padded slings or other appropriate equipment. The use of cables, hooks or chains will not be permitted.
- D. Adjust all hydrants, valve boxes, curb boxes, post blow-offs, buried post blow-off covers, manhole covers and other appropriate facilities to finished grade.
- E. Cut polyethylene encasement in lengths 2 feet longer than the pipe section and place around the pipe.
  - 1. Install polyethylene encasement according DIPRA's "Polyethylene Encasement Installation Guide"
  - 2. Overlap the joint with the polyethylene tube and secure in place with closure tape, after the pipe joint has been made.
  - 3. Fold tube over at the top and secure at quarter points along the pipe section.
  - 4. Remove and replace all damaged tubes.

3.02 JOINTS

- A. Mechanical joints shall be assembled in accordance with the notes on Method of Installation, AWWA C111, Appendix A. All bolts shall be tightened by means of torque wrenches such that the follower shall be brought up evenly. If effective sealing is not obtained at the specified torques, the joint shall be disassembled, cleaned and reassembled.
- B. Push-on joints shall be assembled using lubricant furnished by the manufacturer. The joint shall be made by guiding the plain end into the bell until contact is made with the gasket and exerting sufficient force to drive the pipe home until penetration is made to the depth recommended by the manufacturer.
- C. Flanged joints shall be assembled with through bolts of the size required for the pipe being installed. Stud bolts shall be used only where shown or required. Connecting flanges shall be in proper alignment and no external force shall be required or used to bring them together.
  - 1. Flanges for flanged joints shall be drilled for 125 psi pressure unless otherwise specified.
    - a. Flange bolts and nuts shall low alloy, corrosion resistant steel, except where other materials are called for in the pipe schedule.
    - b. Gaskets for water and sewage piping shall be 1/8 inch thick of the ring type of cloth inserted rubber unless otherwise specified.
    - c. Gaskets for other service shall be as specified.
- D. UNI-FLANGES shall be installed where specified on the contract drawings. They shall be of ductile iron. Set screws shall be AISI 4140 high strength low alloy steel; 190,000 psi tensile strength with the corrosion resistance of CORTEN. Case and core hardened. Dipped in corrosion protection solution - NOT plated. Flanges shall be "Kwick-Flange" as manufactured

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by Standard International or approved equal. Set screws shall be tightened using a torque wrench to the torque specified by the manufacturer.

- E. Bolted Couplings shall be Hymax Pipe Coupling or approved equal.
- F. Grooved and shoulder type joints of the rigid design may be used in lieu of flanged joints with the prior acceptance of the Engineer and shall be in accordance with AWWA C606 and Table 5 for iron pipe.
  - 1. Bolts and nuts shall be cadmium plated steel.
  - 2. Details of supports, anchors and couplings shall be submitted for review.
- G. Field Lock Gaskets shall be used to restraint the pipe per the details in the Contract Drawings.
  - 1. Shall be US Pipe Field Lok or approved equal.

3.03 COATING, PAINTING AND LINING

- A. Coating, painting and lining shall be as follows unless otherwise specified in the pipe schedule:
  - 1. Pipe installed in the ground, in exposed exterior locations, in contact with water or inside structures but not scheduled for painting:
    - a. Interior: Bituminous coating or standard thickness cement lining with sealcoat unless otherwise specified.
    - b. Exterior: Bituminous coating.
  - 2. Pipe installed inside structures or scheduled for painting:
    - a. Interior: Nothing
    - b. Exterior: Pipes with bituminous coatings shall be coated with Inertol "Tar Stop", or Mobil Anti-Bleeding Sealer Aluminum 13-A-1 or equal, or sandblasted as specified, before additional coats described in the piping schedule to receive field painting, a shop prime coat of TNEMEC Series 69 Hi-Build Epoxyliner or equal may be supplied. If a shop prime is applied, the field prime specified in the Section entitled "Painting" shall be touch up only.
- B. Polyethylene encasement shall be supplied and installed per DIPRA Guidelines on those sections of the pipe as indicated on the Plans or AOB.

3.06 DISINFECTION

- A. Disinfect all potable water pipes and appurtenances in accordance with AWWA C651.
- B. Comply with all requirements of the New York State Department of Health for disinfection of potable water lines, valves, hydrants, and appurtenances.
- C. Products
  - 1. Acceptable disinfectants are
    - a. Hypochlorites.
  - 2. Test Kits



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- a. High range test kit for chlorine residual (0-200 mg/l) Hach Chemical Co. Model CN-21P.
- b. DPD chlorine residual test kit (0-3.5 mg/l) Hach Chemical Co. Model CN-66.
- c. Test kits to remain property of the Contractor.

D. Flush mains with clear water at a minimum rate of 2.5 fps prior to disinfection. See Table 1.

TABLE 1 – WATER MAIN FLUSHING DATA		
PIPE DIAMETER (INCHES)	FLUSHING RATE GPM @ 2.5 fps	HYDRANT OPENINGS @ 40 psi
2	25	one - 2-1/2
4	100	one - 2-1/2
6	220	one - 2-1/2
8	390	one - 2-1/2
10	610	one - 2-1/2
12	880	one - 2-1/2
18	1980	two - 2-1/2
24	3510	one - 4-1/2 and one - 2-1/2
30	5510	one - 4-1/2 and two - 2-1/2

E. Hypochlorites: Apply solutions to water mains with a gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions.

F. Application (Continuous Feed Method).

1. Connect chlorinator or force pump to water main upstream from point of repair or replacement, or new lines.
2. Proportion application rate of chlorine solution to obtain a minimum concentration of 50 mg/l of available chlorine. Use high range test kit to determine concentration. See Table 2.

TABLE 2 - QUANTITY OF DISINFECTANT REQUIRED FOR 50 mg/l OF AVAILABLE CHLORINE PER 100 FT. OF PIPE							
PIPE DIAMETER (INCHES)	POUNDS		OUNCES			QUARTS	
	Cl GAS	SOLUTION	HYPOCHLORITE				
		70%	70%	14.7%	5.25%	14.7%	5.25%
2	0.1	0.1	0.2	0.7	2.1	0.1	0.1
4	0.1	0.1	0.6	3.0	8.3	0.1	0.3
6	0.1	0.1	1.4	6.7	18.7	0.2	0.6
8	0.1	0.2	2.5	11.8	33.2	0.4	1.1
10	0.2	0.3	3.9	18.5	51.8	0.6	1.6
12	0.3	0.4	5.6	26.7	74.7	0.8	2.3
18	0.6	0.8	12.6	60.0	168.0	1.9	5.3

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TABLE 2 - QUANTITY OF DISINFECTANT REQUIRED FOR 50 mg/l OF AVAILABLE CHLORINE PER 100 FT. OF PIPE							
PIPE DIAMETER (INCHES)	POUNDS		OUNCES			QUARTS	
	Cl GAS	SOLUTION	HYPOCHLORITE				
		70%	70%	14.7%	5.25%	14.7%	5.25%
24	1.0	1.4	22.4	107.0	298.0	3.4	9.3
30	1.6	2.2	35	167	467	5.2	14.6

- In the absence of a meter, determine rate either by placing a pitot gage at discharge or by measuring the time to fill a container of known volume. See Table 3.

TABLE 3 - TIME FOR DISINFECTANT TO FLOW THROUGH 100 FT. OF PIPE - MINUTES			
PIPE DIAMETER (INCHES)	@ 25 GPM	@ 100 GPM	@ 500 GPM
2	1.0	0.25	0.05
4	3.0	0.75	0.15
6	6.0	1.5	0.3
8	10.0	2.5	0.5
10	16.0	4.0	0.8
12	24.0	6.0	1.2
18	53.0	13.25	2.6
24	94.0	26.0	5.2
30	147.0	37.0	7.4

- Continue to apply chlorine solution until it reaches discharge. Check for the presence of chlorine at discharge by adding an orthotolidine reagent. In the presence of chlorine the reagent will turn red.
- Maintain chlorinated water in the main for a minimum of 24 hours. At the end of this period chlorine concentration shall be at least 25 mg/l. Use high range test kit to determine concentration.
- Operate all valves and hydrants to insure their proper disinfection.
- Prevent back flow of super chlorinated water into existing distribution system.

G. Final Flushing:

- Give the OWNER 72 hour notice prior to flushing any section of the main. The OWNER will review both the time and rate of flushing.
- After a 24 hour retention period, flush main until maximum chlorine concentration is 1.0 mg/l. Use DPD chlorine residual test kit.
- Water used to disinfect the water mains shall be dechlorinated prior to discharge. Only water free of chlorine (< 0.1 mg/l total residual chlorine) can be discharged to a surface water and the discharge of the chlorine-free water shall be performed in a non-erosive-

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DUCTILE IRON PIPE

manner that will not adversely affect plants and animals. The discharge shall comply with applicable State regulations for waste discharge.

4. Sodium thiosulfate or approved equal shall be used as the dechlorinating agent.
- H. Bacteriological Tests:
1. Test water main in the presence of the ENGINEER for bacteriological quality before putting pipe into service. Contact local health units for sampling criteria and procedures. Pay all expenses incurred for testing.
  2. Tests shall be conducted by a laboratory approved by the New York State Health Dept.
- I. Give all test results to Engineer.
1. Should test results prove any part of the system bacteriologically unsafe, repeat disinfection procedures until satisfactory results are obtained.
- K. Do not place the test section of pipe in service or install any services until written approval of the health sample is provided to the ENGINEER by the Health Department and approval is given by the ENGINEER to place the tested pipe section in service.

3.06 TESTING

- A. See Section 330505.31 – Hydrostatic Pressure and Leakage Testing for test procedures.

END OF SECTION

SECTION 332610  
PIPELINE INSTALLATION

PART 1. GENERAL

1.01 WORK SPECIFIED

Installation of all metallic and non-metallic pipe, conduit, fittings and specials of the type and quality as shown in the pipe schedule or on the Contract Drawings.

1.02 SUBMITTALS

Test reports, certifications, manufacturer's technical data, installation instructions, and shop drawings are required for each type of pipe to be installed.

Layout drawings are required for the pipeline to be installed within structures showing the location including the support system restraint, sleeves, and appurtenances.

PART 2. PRODUCTS

2.01 PIPE

- A Materials for the piping, joints and fittings shall be as specified in the section for the type of pipe to be installed, shown in the pipe schedule or on the Contract Drawings.
- B Pipe and appurtenances shall comply with the applicable standards for its type of material.

2.02 JOINTS

- A. Type of joints shall be as scheduled in the pipe schedule or as shown or noted on the Contract Drawings.
- B. Grooved and shoulder type joints of the rigid design may be used in lieu of flanged joints on the ductile iron or steel pipe with the prior acceptance of the ENGINEER.

2.03 INSPECTION

- A Pipe and appurtenances shall be inspected by the CONTRACTOR in the presence of the ENGINEER on delivery and prior to installation for conformance with the standards and specifications.
- B Materials not conforming to the standards and specifications shall not be stored on the site but removed at once and replaced with materials conforming to the specifications.

PART 3. EXECUTION

3.01 INSTALLATION - UNDERGROUND

- A. General
  - 1. Excavation and backfilling shall be in accordance with the applicable provisions of the Section entitled "Excavation and Backfill".
  - 2. Blocking will not be permitted under pipe, except where the pipe is to be laid with concrete cradle or encasement.

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PIPELINE INSTALLATION

3. No pipe shall be laid on a foundation in which frost exists, or at any time when there is danger of the formation of ice or the penetration of frost at the bottom of the excavation.
  4. Temporary bulkheads shall be placed in all open ends of pipe whenever pipe laying is not actively in process. The bulkheads shall be designed to prevent the entrance of dirt, debris or water.
  5. Precautions shall be taken to prevent the flotation of the pipe in the event of water entering the trench.
  6. A 6" wide warning tape with continuous wording "CAUTION: BURIED PIPELINE BELOW" shall be installed not greater than 24 inches above all pipelines.
  7. Waterline installation shall conform to AWWA C600-93.
- B. Location and Grade
1. Pipelines and appurtenances shall be located as shown on the Contract Drawings or as directed and as established from the control survey in accordance with the Special Provisions.
  2. The alignment and grades shall be determined and maintained by a method acceptable to the ENGINEER.
  3. All water lines shall be buried a minimum of 5 feet from top of pipe.
- C. Subgrade
1. The subgrade for pipelines shall be earth or special embedment as specified or directed and shall be prepared in accordance with the Section 02221.
- D. Joints
1. Joints shall be assembled using gaskets, lubricants and solvents as furnished by the pipe manufacturer and in accordance with the manufacturer's recommendations.
- E. Wrapping of Pipe
1. Ductile iron pipe and fittings shall be wrapped in polyethylene per AWWA standards.
- F. Embedment
1. Embedment shall be deposited and compacted in accordance with the Contract Drawings.
- G. Thrust Restraints
1. Pressure pipelines shall have thrust restraints in the form of mechanical restraints of the size and type specified or as required by the pressure and stability of the supporting surface.
  2. Thrust restraints shall be installed at all changes in direction, changes in size, dead ends or other locations where shown.
  3. Thrust restraints shall be in place, and when of concrete shall have developed the required strength, prior to testing of the pipeline.
  4. Tie rods and nuts for thrust restraints shall be of high tensile steel and shall have a minimum yield strength of 70,000 psi.
  5. Tie rods and nuts installed underground shall be coated with two coats of coal tar pitch preservative coating after installation.

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PIPELINE INSTALLATION

3.02 INSTALLATION – EXPOSED/ABOVE GROUND

Exposed pipelines shall be carefully erected, neatly arranged, and run parallel to wall of structure.

Supports and anchors shall be adequate to support the pipe filled with water with a minimum safety factor of 5 and for test pressure specified.

Special supports shall be as specified in the Section for the type of pipe being installed.

All water pipelines and fittings shall be wrapped in closed-cell foam insulation and sealed to prevent condensation.

All exposed PVC piping shall be painted unless it is covered by insulation

3.03 CUTTING AND SPECIAL HANDLING

Field cuts of pipes shall be in accordance with the manufacturer's instructions.

Where a pipe requires special handling or installation it shall be in accordance with the Section for that type of pipe.

3.04 FLEXIBLE COUPLINGS

See Ductile Iron Pipe Specification.

3.05 WALL CASTINGS AND SLEEVES

All pipelines passing through walls, floors or slabs of structures shall be installed in a wall casting or sleeve. See Wall Castings and Sleeves Specification.

3.05 LEAKAGE TEST

All pipelines shall be tested for leakage in accordance with the Hydrostatic Pressure and Leakage Testing Specifications.

3.06 CHLORINATION

All pipelines designed to convey potable water shall be chlorinated in accordance with Ductile Iron Pipe Specification.

3.07 TRACER WIRE

All pipelines shall be installed with a tracer wire that is installed and terminated per manufacturer's recommendations.

1. Provide #12 AWG Copper Clad Steel, extra high strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE insulation thickness.

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PIPELINE INSTALLATION

2. All tracer wires must be interconnected in intersections with main lines and services, and hydrant leads.
3. All tracer wire terminations points must utilize a wire access box specifically manufactured for this purpose. Use Copperhead Industries Snake Pit tracer boxes.
4. Install termination points at intersections with water mains, services, hydrant leads, valve boxes, at 90 degree bends, and at 45 degree bends.

3.08 TRACER TAPE

All pipelines shall be buried with detectable tracer tape installed per manufacturer's recommendations. Tracer tape shall be Trumbull Industries or approved equal.

3.09 ADJUSTMENT OF UTILITY COVERS TO GRADE

The CONTRACTOR shall adjust the existing facilities such as water valves, valve boxes, and any other utility to grade, alignment, and slope of the finished roadway as determined by OWNER.

The CONTRACTOR shall support and protect all existing utilities within his work area. All manholes, frames and covers and water valve boxes of all existing utilities disturbed or exposed by construction shall be adjusted by the CONTRACTOR to one-quarter inch (1/4") below new finished grade elevations prior to placement of final pavement.

END OF SECTION

SECTION 117500  
WASTE WATER CONTROL SYSTEM (WWCS)

PART 1        GENERAL

1.01    SUMMARY

- A. All equipment and wiring shall conform to standard electrical practice and to all applicable sections of the NEC reference to low voltage applications.
- B. Include, in general, with the WWCS System but without limitation:
  - 1. Control panel enclosures for new applications.
  - 2. All necessary hardware, software and programming (both for upgrades to existing systems and for new applications) to perform the WWCS functions described herein and required for operation of the system.
  - 3. Install Stratix Fiber Optic 8 Port Switches in the PLC and RIO cabinets.
  - 4. Furnish and install the Sludge Building CP (PLC-1) NEMA 12 enclosure in the Sludge Building.
  - 5. Furnish and install the Headworks RIO (RIO) NEMA 12 enclosure.
- C. The WWCS System shall execute the following functions:
  - 1. Monitor and control operations via two operator interface terminals (OIT) at the Sludge Building CP and Headworks RIO consisting of industrial computer with touch screen capability and HMI client application software.
  - 2. Automatically record information pertaining to these operations.
  - 3. Communicate between hardware components and field instrumentation.
  - 4. Display all monitored values and alarms at the local operator interface.
- D. Include field-testing and services of qualified representatives of the WWCS System supplier.
- E. It is the intent of this Contract that the WWCS installations be complete in all respects and ready for use and operation. The Contractor shall be responsible for all details, devices, accessories and special construction necessary to properly finish, install, adjust, test and place in successful continuous operation a complete installation.
- F. The Schedules in this Section are not necessarily complete. The Contractor shall not rely on the Schedules but shall thoroughly examine the Contract Documents prior to bid to determine the work required under this Contract.

1.02    QUALITY ASSURANCE

- A. All equipment covered by these specifications shall be the products of reputable, qualified, and successful manufacturers who are of proven ability and have long experience in the production of such equipment.
- B. All equipment specified in this Section shall be provided by the WWCS System Supplier.
- C. The Contractor shall pay all royalty or license fees for use of patented devices or systems and



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WASTE WATER CONTROL SYSTEM (WWCS)

shall protect the Owner from patent infringement litigation thereon.

- D. All components of the WWCS System have been included under this Section so that the OWNER will receive completely coordinated and properly integrated system for efficiency, ease in operation and, correct functional relationship among all elements of the system. Therefore, it is the intent of this Contract that the equipment specified under this Section will be furnished by a single WWCS System Supplier. This does not require that all equipment be manufactured by a single manufacturer, but does require that the WWCS System Supplier be responsible for the satisfactory operation of the instrumentation and metering equipment and the WWCS System furnished hereunder.

1.03 SYSTEMS INTEGRATOR:

The physical layout of the WWCS system is shown on the contract drawings and the equipment specifications. The use of an "or equal" system will require the WWCS supplier to document experience on at least 10 similar systems with major upgrades of equal size or larger subject to the approval of the ENGINEER. The WWCS System shall be in compliance with these specifications and plans.

- A. If the Contactor proposes an "or equal" WWCS system, it shall be understood that the proposed system meets or exceeds the specified performance and construction and offers a cost savings to the OWNER. The CONTRACTOR may be responsible for engineering time to review proposed substitutions.
- B. The following is a minimum qualifications submittal:
1. WWCS system supplier shall submit, within 15 (fifteen) calendar days of the bid, detailed information on their staff and organization to show compliance with the Quality Assurance requirements of this Section. The Qualifications submittal shall be submitted and favorably reviewed before any further submittals will be accepted. Failure to meet the minimum requirements shall be grounds for rejection as acceptable.
  2. Copy of UL-508 certificate for panel fabrication facilities.
  3. Five (5) references for water or wastewater projects successfully completed within the last five years. Successful completion shall be defined as a finished project completed on Potential references shall be for projects where the WWCS system supplier's contract, excluding change orders, is \$125,000 minimum.
- C. The WWCS System Supplier will also be the WWCS System Installer and will designate an experienced employee as the Systems Integrator. The Systems Integrator will be responsible for all planning, field planning, submittals, proposals, on site coordination, installation, proper programming and operation of the fiber equipment, all callbacks, all warranty items and training of the Owners employee's on the system operation and all field programmable system parameters. The Systems Integrator will be the sole contact for the Owner, General Contractor and the Project Engineer. After commencement of the WWCS installation, the

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Systems Integrator will be required to be on site at least 1 day (8 hours) per week and will provide the Project Engineer with at least 48 hours notice of the scheduled site visit.

- D. The WWCS Systems Supplier will be required to be located within 150 miles of the site and be able to provide onsite assistant within 4 hours if required in the event of an emergency.
- E. Warranty: The WWCS Systems Supplier will provide a complete labor, mileage and parts replacement warranty for one year after final acceptance of the work for all equipment provided by the WWCS System Supplier.
- F. The WWCS System Integrator must be a UL-508A certified panel shop at the time of Bid, or utilize a UL508 panel shop for all panel design and construction.

1.04 PERFORMANCE REQUIREMENTS

- A. The WWCS System Supplier, through the Systems Integrator, shall have total responsibility for the performance and compatibility of the entire WWCS system as shown on the Drawings and as specified herein. The WWCS supplier shall have sole responsibility for the quality and proper functioning all of components shown on the Drawings, as specified herein, and as specified in Section 11700 "Instrumentation Equipment" including those not of the supplier's manufacture.

1.05 Submittals

A. Shop Drawings

- 1. The WWCS System supplier shall submit detailed shop drawings, complete information on all components, theory of operation, evidence of chemical compatibility, equipment piping and valve layouts, and detailed electrical wiring and WWCS diagrams.
- 2. All submittals shall be sufficient in detail to demonstrate that the supplier will furnish the equipment in accordance with the Contract Documents and that the equipment is satisfactory for its intended use. The Contractor shall submit a complete list of parts and supplies for each different item of equipment installed, and a list of parts and supplies that are recommended by the manufacturer to assure efficient operation of the equipment.
- 3. As a minimum, submit the following documentation with the shop drawings:
  - a. Physical description of all hardware.
  - b. Functional description of all hardware and programming.
  - c. Theory of operation.
  - d. Operating procedures.
  - e. Listing of programming used.
  - f. Internal wiring diagrams for each panel, numbered wire, numbered terminal on the instrument and numbered terminal block. This includes both new panels and upgrades to existing panels.

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WASTE WATER CONTROL SYSTEM (WWCS)

- g. Complete, and in every detail, interconnection wiring diagram and process and instrumentation diagrams (loop diagrams) in accordance with ISAS5.4 Instrument Loop Diagrams, Illustration 7.4, latest revision, showing all field and panel mounted equipment and terminal identification. Use the same component identification as shown on the drawings and indicated herein where possible.
  - h. List of all inputs and outputs for each PLC.
- 4. Prior to the Instrumentation and WWCS System Supplier starting work on the WWCS system, a meeting shall be held with the General Contractor, the Electrical Contractor, the WWCS System Supplier, the Engineer, and the Owner. The purpose of the meeting will be to resolve all issues regarding system architecture, WWCS loop functions, and WWCS functions. This meeting typically takes one day and should be scheduled as soon as reasonably possible after the award of the contract (typically 30 days). The WWCS System Supplier is expected to have his project team in place prior to the meeting and all relevant members of that team shall be in attendance at the meeting.
- B. Operation and Maintenance Manual - The Contractor shall furnish complete operation and maintenance manuals for the treatment modules including part schedules to assist in assembly, disassembly, and ordering parts. Specific operation and maintenance instructions shall be prepared for the entire system by the WWCS System Supplier. Operation and maintenance instructions for individual components should be included with the package; however, written instructions, drawings, and schematics must cover the complete system, not just specific components.

## PART 2 PRODUCTS

### 2.01 PROCESS EQUIPMENT

See Section 117000 "Instrumentation Equipment"

### 2.02 SYSTEM WWCS

- A. The Control system vendor shall supply the WWCS system and furnish additional components to the WWCS system providing all necessary control functions for totally integrated operation of the plant process. Included in the upgrades, but not limited to, shall be the Mechanical Screens, Grit System, Odor Control, Flow Meter, and Gas Detection. The controls shall be as described hereafter.
- B. Control Panels
  - 1. All controls panels which are to be located indoors shall be of NEMA 12 (oil and dust tight) free standing design constructed of 14 gauge cold rolled steel provided with a finish of rust inhibiting primer followed by two (2) coats of industrial grade enamel, white inside and ANSI 61 gray outside. Panel components will be mounted and wired to terminal strips for Contractor field connections. All outdoor enclosures shall be stainless steel NEMA 4X with heaters.

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C. Programmable Logic Controller

1. PLCs shall be Allen Bradley CompactLogix with Ethernet capabilities or equal.
2. Factory programmed Programmable Logic Controller (PLC) shall be provided within all control panels. The WWCS system noted herein must be capable of expansion. The PLCs shall be capable of monitoring inputs and providing outputs as required for system logic, and shall include no less than 20% spare analog and discrete inputs and outputs, 20% spare non-volatile logic memory with no less than 8K words, 1920 registers, 2.5 ms/K scan time, and 14 bit analog resolution.
3. The PLC shall accept analog inputs (4-20mA) from system analyzers and transmitters for monitoring and trending on an Operator Workstation (HMI) and Operator Interface Terminal (OIT) as specified herein, as depicted on the Process, Instrumentation and WWCS Diagram and the project specifications.
4. System logic will monitor and control all components as shown on the Drawings or this specification.

The following lists the required PLC, hardware and software requirements, UPS requirements, etc.

5. Sludge Building CP (PLC-1)
  - A. Rack Layout – The PLC-1 rack shall consist of a Allen Bradley CompactLogix Controller with CPU, Power Supply, Ethernet, 1.5M Memory, and Analog and Digital IO:  
  
2 – 16 Pt. 24VDC Input Cards 1769-IQ16  
2 – 16 Pt. Output Card 1769-OB16K  
1 – 4 Pt. Analog Input Cards 1769-IF4  
1 – 4 Pt. Analog Output Card 1769-OF4CI
  - B. Power Supply Module – The power supply module shall be a CompactLogix 1769-PA4 120/240V AC Power Supply (5V @ 4 Amp).
  - C. Central Processing Unit (CPU) – The CPU shall be a CompactLogix EtherNet processor model# 1769-L35E or Engineer Approved Equal.
  - D. Fiber Optic Modem – Stratix Self Healing Ring Switch with a fault contact. The fault contact will be brought into a spare DI and incorporated into the WWCS system for alarm and monitoring.
  - E. Uninterruptible Power Supply – The UPS in PLC-1 will be shall be a 1 KVA Smart UPS.

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- F. Fiber Optic Patch Panel – A Fiber Optic Patch Panel will be incorporated in PLC-1 as to provide a termination for Fiber Optic Cables.
  - G. Fiber Optic Patch Cables – Fiber Optic Patch Cables will be used in PLC-1 to run from the Fiber Optic Patch Panel to the Fiber Optic Switch.
  - H. Ethernet switch sized for application. This shall be a Stratix ethernet switch with 16 copper ports. One of the copper ports shall be tied to the fiber switch.
  - I. Operator Interface Terminal (OIT) – The OIT for PLC-1 shall be a PanelView Plus 7, 15” Color Active Matrix TFT Display. The OIT will have a touchscreen, Standard Communications (Ethernet & RS-232, AC Input and 64MBFlash/64MB RAM.
  - J. All inputs shall be fused at the PLC control panel by the WWCS vendor.
  - K. Additional IO Points and Programming shall be added as required by the IO list and the WWCS strategies.
6. Headworks Remote I/O CP
- A. Rack Layout – The Headworks Remote IO rack shall consist of a Allen Bradley Communications Module, Power Supply, Fiber Optic Switch- Phoenix 5port with one fiber optic port, and Analog and Digital IO:
    - 2 – 32 Pt. 24VDC Input Cards 1769-IQ32
    - 2 – 16 Pt. Output Card 1769-OB16K
    - 2 – 4 Pt. Analog Input Cards 1769-IF4
    - 1 – 4 Pt. Analog Output Card 1769-OF4CI
  - B. Uninterruptible Power Supply – The UPS in the remote IO panel shall be a 1 KVA Smart UPS.
  - C. The remote IO panel shall come in a NEMA 12 panel.
  - D. Fiber Optic Modem – Stratix Self Healing Ring Switch with a fault contact. The fault contact will be brought into a spare DI and incorporated into the WWCS system for alarm and monitoring.
  - E. Fiber Optic Patch Panel – A Fiber Optic Patch Panel will be incorporated in Headworks Building RIO as to provide a termination for Fiber Optic Cables.
  - F. Fiber Optic Patch Cables – Fiber Optic Patch Cables will be used in Headworks Building RIO to run from the Fiber Optic Patch Panel to the Fiber Optic Switch..

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- G. Ethernet switch sized for application. This shall be a Stratix ethernet switch with 16 copper ports. One of the copper ports shall be tied to the fiber switch.

D. Automatic System Operation – WWTP

- 1. Automatic system operation shall be based on alarm and WWCS levels displayed on the operator work station (HMI) and operator interface terminal (OIT) in desired engineering units (ft, gpm, %, etc.) as follows:
  - a. Influent Flow Meter
    - 1. Influent Flow
    - 2. Totalized Flow
  - b. Mechanical Screen
    - 1. Screen HOA status
    - 2. Screen Run Status
    - 3. Screen Fault
    - 4. Screen operational float
    - 5. Screen Channel High Level Float
  - c. Compactor
    - 1. Compactor HOA status
    - 2. Compactor Run Status
    - 3. Compactor general fault
  - d. Grit Vortex Unit
    - 1. Grit Vortex HOA status
    - 2. Grit Vortex Run Status
    - 3. Grit Vortex general fault
  - e. Grit Pump
    - 1. Grit Pump HOA status
    - 2. Grit Pump Run Status
    - 3. Grit Pump general fault
  - f. Grit Classifier
    - 1. Grit Classifier HOA status
    - 2. Grit Classifier Run Status
    - 3. Grit Classifier general fault
    - 4. Grit Conveyor HOA Status
    - 5. Grit Conveyor Run Status
    - 6. Grit Conveyor Fault
  - g. Gas Monitoring

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1. Explosive Gas Level #1
  2. Explosive Gas Level #1
  3. O2 Level #1
  4. O2 Level #2
  5. H2S Level #1
  6. H2S Level #2
- h. Odor Control
1. Odor Control Unit #1 HOA Status
  2. Odor Control Unit #1 Run Status
  3. Odor Control Unit #1 Fault
  4. Odor Control Unit #2 HOA Status
  5. Odor Control Unit #2 Run Status
  6. Odor Control Unit #2 Fault
- i. Operator Alarm Outputs
1. Alarm Output #1 – Alarm listing
  2. Alarm Output #2 – Alarm listing
  3. Alarm Output #3 – Alarm listing
  4. Alarm Output #4 – Alarm listing
  5. Alarm Output #5 – Alarm listing
  6. Alarm Output #6 – Alarm listing
  7. Alarm Output #7 – Alarm listing
  8. Alarm Output #8 – Alarm listing
- E. Operator Controls – Local Control Panels (Supplied by Equipment Suppliers)
1. Hand-Off-Auto selector switches and call, run, fail pilot lights shall be provided for the, the mechanical influent screen and washer/compactor, and the grit removal system.
  2. Control packages, complete with all logic required for the individual control of the equipment shall be provided for each of the (1) mechanical bar screen, (1) washer/compactor, and (1) grit removal system. These control panels shall be capable of communication with the SCADA as noted herein.
- F. Fiber Optic Port Switch (Six) – The fiber optic port switch shall be a Stratix Self Healing Ring or Engineer Approved Equal.
1. General
- a. The PLCs and Workstations shall be connected to the WWCS network backbone through a 10/100 Industrial Rail Ethernet Switch. The Switch shall support fault tolerant ring architecture and shall provide full duplex capability and redundant power. 10/100 Industrial Rail Ethernet Switch shall provide five or more 10/100 Fast Ethernet ports, plus one standby port via RJ45 interfaces and one V.24 interface for external management. Two uplink ports shall be provided for integrated connectivity

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to the fault tolerant Network backbone. Depending upon the fiber used the uplink ports will be Cat 6 cable or multimode fiber with ST connectors.

2. Frame Switching Functions

- a. All data received by the switch from the system bus or at the ports shall be stored and checked for validity. Invalid and defective frames as well as fragments shall be discarded. The switch shall forward valid frames.
- b. The switch shall learn all source addresses per port. Only packets with: unknown addresses, this address or a multi/broadcast address in the destination address shall be sent to this port. The switch shall be capable of learning two thousand (2,000) addresses.
- c. The Switch shall monitor the age of the learned addresses. The Switch shall delete address entries from the data table that exceed a certain age.
- d. The Switch shall support two priority queues. The classification of received data packets to these classes shall be done by: the pre-defined classification in statistical address entries and the priority of the data packet included in the VLAN packet.
- e. On data packets with VLAN tags the switch shall analyze the 3 bit priority field. Data packets with VLAN tags and a maximum long data field shall be transmitted. Data packets received without VLAN tags shall be transmitted without VLAN tags.

3. Specific Functions of the TP/TX Interface

- a. The Switch shall monitor the connected TP/TX line segments for short circuit or interrupt using regular link test pulses in accordance with IEE standard 802.3 10/100BASE-TX. The Switch shall not transmit any data in a TP/TX segment from which it does not receive a link test pulse.
- b. If the reception line pair is incorrectly connected (RD+ and RD- switched) polarity shall be automatically reversed.
- c. 8 Port minimum.

4. Self-Healing Functions

- a. The Switches shall allow the backbone to assimilate a ring architecture. If one does switch fails or the backbone cable is cut, the ring structure shall change itself into a line structure within 0.5 seconds with up to 50 Switches on the network.

5. Voltage Supply



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- a. The voltage supply shall be redundant 24 VDC power supplies

6. Management

- a. The Switch shall support SNMP and Web-based management for extensive diagnosis and configuration functions to allow easy startup procedures and allow network and device information. The Switch shall support TCP/IP protocol family.

7. Technical Specifications

- a. Operating Voltage – 24 VDC -25%, +33%
- b. Current Consumption – 0.8 A max. at 24 VDC
- c. Overload current protection – thermal fuse
- d. Ambient temperature - 0°C to 50°C
- e. Storage Temperature - -20°C to 80°C
- f. Humidity – 10% to 90% (non-condensing)
- g. Port attenuation – 11dB at 1300nm

- 8. Rail Switch shall be newest RS20 switches by Hirschmann.

2.03 WWCS STRATEGIES – Water Plant

- A. The following WWCS strategies describing the operations of each WWCS loop indicated on the Drawings will be considered the essence of the specifications. Furnish and install all necessary equipment, instruments, software modules and appurtenances to achieve the performance as hereinafter described, even though such items may not be included in any specific listing of equipment to be furnished. An involved system of this nature requires emphasis on the functional aspects of the Specifications while the technical details serve to indicate the desired manner in which the end result will be accomplished. The control and monitoring strategies indicated below are for equipment external to any existing or proposed packaged process equipment. Control strategies for the packaged process equipment shall be as described in other parts of this specification and as required for proper operation of the system. The following control strategies are associated with the treatment facility indicated below:

1. Mechanical Influent Screens

- a. The one proposed influent screen shall be operated via a screen vender supplied control panels with communication between the vender control panel and the plant

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WWCS. The vendor supplied control panel shall provide the control logic for the screens and the WWCS shall monitor the screens only. The WWCS vendor shall review the mechanical screen control panel specification sections and shall coordinate with the screen vendor to ensure compatibility between the systems. The WWCS shall display the “HOA status”, “run” status, “general fault alarm”, screen operational float status, and screen channel high level float alarm.

- b. WWCS: The WWCS shall indicate the operation status for the screen, including HOA status, screen run status, screen general fault, screen operational float status and screen channel high level float alarm. The WWCS system shall display the screens operating status. The WWCS shall initiate an alarm upon a screen general fault and a high liquid level condition. The WWCS shall accept and display each of the above status and alarm conditions. The WWCS vendor shall review the screen panel specification sections and shall coordinate with the screen vendor to ensure compatibility between the systems.

2. Compactor

- a. The one proposed screening compactor shall be operated via a compactor vendor supplied control panel with communication between the compactor vendor supplied CP and the plant WWCS. The vendor supplied panel shall provide the control logic for the compactor, with the WWCS monitoring the compactor only. The WWCS vendor shall review the compactor control panel specification sections and shall coordinate with the compactor vendor to ensure compatibility between the systems. The WWCS shall display the “HOA status”, “run” status and “general fault alarm”.
- b. WWCS: The WWCS shall indicate the operation status for the screenings compactor, including “compactor running”, “HOA status” and “general fault alarm”. The WWCS system shall display each compactor operating status. The WWCS shall initiate an alarm upon a compactor general fault. The WWCS shall accept and display each of the above status and alarm conditions.

3. Vortex Grit Removal System

- a. The one proposed grit removal systems consist of a vortex grit stirrer, a grit pump, a grit classifier, and grit conveyor. The grit removal system shall be controlled via a grit removal system vendor supplied PLC with Ethernet communication with the plant WWCS. The vendor supplied PLC shall control the grit removal process with the WWCS monitoring the process only. The WWCS vendor shall review the grit control panel specification sections and shall coordinate with the grit vendor to ensure compatibility between the systems.
- b. WWCS: The WWCS shall indicate the operating status for the grit stirrer, grit fluidizing system, grit pump, grit classifier, and grit conveyor, including “grit stirrer run”, “grit stirrer general alarm”, “grit fluidizing HOA status”, “grit fluidizing run”, “grit fluidizing general fault”, “grit pump HOA status”, “grit pump run”, “grit pump

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general alarm”, “grit classifier HOA status”, “grit classifier run”, “grit classifier general alarm”, “grit system timer” setpoint “grit conveyor HOA status”, “grit conveyor run”, and “grit conveyor general alarm”. The WWCS shall accept and display each of the above status and alarm conditions.

4. Odor Control

- a. The two proposed odor control units shall be operated via a odor control vender supplied control panel with communication between the compactor vender supplied CP and the plant WWCS. The vender supplied panel shall provide the control logic for the odor control units, with the WWCS monitoring the odor control units only. The WWCS vendor shall review the odor control vendor control panel specification sections and shall coordinate with the odor control vendor to ensure compatibility between the systems. The WWCS shall display the “HOA status”, “run” status and “general fault alarm”.
- b. WWCS: The WWCS shall indicate the operation status for the odor control units, including “odor control unit running”, “HOA status” and “general fault alarm”. The WWCS system shall display each odor control unit operating status. The WWCS shall initiate an alarm upon a odor control unit general fault. The WWCS shall accept and display each of the above status and alarm condition.

5. Gas Monitoring

- a. The WWCS system shall continuously monitor, display and alarm O2 Levels, Explosive gas levels, and H2S Levels.

6. Callout Alarm – Output System

- a. The WWCS shall provide 8 distinct digital alarm outputs within PLC-1. The WWCS shall allow for the operator to categorize each alarm condition in the system into a “callout”, no “callout category”. The WWCS shall further allow each alarm condition in the “callout category” to be selected by the operator into one of the 8 digital outputs. These outputs shall be sent to the control room by the WWCS vender and incorporated into the control board.

2.04 POWER SUPPLIES

- A. Furnish power supplies located in the PLC and RIO cabinets of the d-c solid state type, designed for 2 and 4 wire transmitter loops where integrals instrument power supplies are not provided. Furnish power supplies suitable for use up to 15 instrument loops and designed for 4-20 mAdc current signals.

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2.05 SPARE PARTS AND EQUIPMENT

- A. Furnish the following spare parts and equipment and store as directed:
  - 1. One of each type of plug-in, process I/O board for PLC.
  - 2. 5 - 32GB Thumb Drives
  - 3. 5 spares for lights, fuses, or other consumable items.

2.06 TOOLS

- A. Furnish a complete set of special tools required for the maintenance and operation of this equipment, as designed by the equipment manufacturer.

2.07 SHOP PAINTING

- A. Furnish equipment with a complete manufacturer's standard corrosion resistant finish at the point of manufacturer. Engage the instrumentation supplier to provide adequate paint for repainting any areas damaged during delivery, storage or installation.

2.08 SHOP TESTING THE WWCS SYSTEM

- A. Prior to shipment of the new WWCS system, factory test all elements of the system, both hardware and software to demonstrate that the total system satisfies all of the requirements of this Specification.
- B. Furnish all special testing materials and equipment. Where it is not practical to test with real process variables, provide suitable means of simulation. These simulation techniques shall be subject to the approval of the Engineer.
- C. Testing shall not be considered complete until all tests and test documentation has been completed, reviewed, and approved by the Engineer. Tests shall generally conform to the applicable sections of ISA-RP55.1. Demonstrate that all equipment conforms to these Specifications by submitting test results for similar units.
- D. Coordinate all of the testing with all other associated suppliers and with the Owner, as specified. Notify the Engineer at least four weeks prior to start of test.
- E. As a minimum, test the System at the factory with simulated inputs and outputs. Exercise all components and test all functions over their entire range. During the test, operate the system long enough to demonstrate that it is capable of continuous operation.
- F. Submit a minimum of six copies of the results of the factory tests to the Engineer for review.
- G. In the event that the conditions specified are not met or if the test is deemed unsatisfactory

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for other reasons, correct the fault and retest the entire system until the tests are satisfactory to the Owner all at no additional cost to the Owner.

- H. The Owner may elect to have up to three of his authorized representatives present to witness the tests. The Owner's authorized representatives will have access to all parts of the equipment, apparatus and test instruments and will have the right to check any or all readings, calibrations, or any factor necessary to determine whether or not the performances are in accordance with the Specifications.
- I. Prior to the Factory Acceptance Test the WWCS vendor shall submit all screen shots to Owner for review. Once approved the WWCS vendor shall integrate them into the system.
- J. The Owner reserves the right to waive the presence of any or all of his representatives at any or all witness tests. This right of waiver does not release the manufacturer from performing the required tests.

2.09 ELECTRICAL REQUIREMENTS

- A. The power service to the PLC WWCS Panels shall be 120vac, 60 hz, single phase from the UPS provided under this section.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The WWCS System supplier shall be responsible install all equipment in accordance with the Drawings and manufacturer's recommendations or as directed by the Engineer.

3.02 PLANT STARTUP AND OPERATOR TRAINING

- A. The WWCS supplier shall provide field tests of all the equipment specified to demonstrate compliance with all requirements for complete and ready for operation of all equipment. Final acceptance of the WWCS system will be made after complete system testing in the field is complete and the treatment system has operated for 2 weeks.
- B. The WWCS system supplier shall provide a minimum of two (2) work days of onsite service for plant startup. Training shall be conducted by a factory trained plant operator employed by the manufacturer, and shall include all WWCS components.
- C. The WWCS system supplier shall also provide a minimum of one (1) work days of onsite operator training. Training shall be conducted by a factory trained plant operator employed by the manufacturer, and shall include all WWCS components.

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3.03 FIELD ACCEPTANCE TESTING FOR WWCS SYSTEM

- A. The objective of these tests is to demonstrate that the WWCS System is operating and complying with the specified performance requirements.
- B. Perform witnessed Functional Acceptance Tests on the complete system. Demonstrate each function to the satisfaction of the Engineer and the Owner on a paragraph-by paragraph basis.
- C. Each test shall be witnessed and signed off by both the Contractor and the Engineer upon satisfactory completion.
- D. Conduct the actual testing program with prior approved procedures and documentation.
- E. For each test description include the following minimum information:
  - 1. Spec page and paragraph of function or loop demonstrated.
  - 2. Description of function or WWCS strategy and test to demonstrate it.
  - 3. Space for sign off and date by the Contractor, the Engineer, and the Owner.
- F. After receipt of approval by the Engineer of the documentation and the test procedures and forms, set a date to start the test.

3.04 DEFINITION OF ACCEPTANCE

- A. WWCS System acceptance shall be defined as that time when the following requirements have been fulfilled:
  - 1. All submittals and documentation have been submitted and reviewed and approved.
  - 2. The complete WWCS System has successfully completed all testing requirements cited herein.
  - 3. The training program has been completed.

END OF SECTION

SECTION 407000  
INSTRUMENTATION EQUIPMENT - WWTP

PART 1. GENERAL

1.01 SUMMARY

- A. This Section provides acceptable products and product requirements and installation considerations for process control and monitoring equipment to be installed.

1.02 RELATED SECTIONS

- A. Section 406000 – WWCS SYSTEM
- B. Section 260519 – Wiring General 600V and Under

1.03 SUBMITTALS

- A. Catalog Cuts and Shop Drawings shall be submitted for approval for all equipment herein specified.
- B. An Order Specification shall be included which shall describe in detail all equipment provided.
- C. Manufacturer's wiring diagrams that are not job-specific (standard drawings with options crossed out, etc.) are not acceptable. Standard sales brochures shall only be provided to supplement technical data. Interconnection details shall be shown on the wiring diagrams for all field mounted instrumentation.
- D. A Description of Operation shall be provided detailing the operation of the component, initial configuration settings, and maintenance requirements.
- E. Supplier shall submit six (6) sets of shop drawings. Shop drawings shall include equipment descriptions, specifications, dimensional and assembly drawings, parts lists, and job specific drawings.
- F. Supplier shall submit three (3) sets of Operation and Maintenance manuals. The manuals shall include equipment descriptions, operating instructions, drawings, troubleshooting techniques, a recommended maintenance schedule, and the recommended lubricants.

1.04 SUPPLIERS

- A. Acceptable suppliers:
  - 1. All equipment specified in this Section as well as Section 406000 – WWCS shall be provided by the WWCS System Supplier.
  - 2. Where products of alternate suppliers are proposed, provide submittal information on the Specified Item and the Or Equal Item proposed. To verify suitability of Or Equal, Contractor may be required to furnish additional documentation or to extend product warranties.
- B. Where products of specific manufacturers are specified, the I&C Supplier shall be responsible for integrating the part into the overall systems.

1.05 QUALITY ASSURANCE

- A. Provide functional testing of all installed components in accordance with a schedule approved by the Engineer.

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1.06 DELIVERY, STORAGE, AND HANDLING

- A. Equipment will not be delivered to the site until they are ready to be installed. Equipment stored on site will be stored in clean dry heated space and protected by the Contractor at his expense until the item is to be installed.

PART 2. PRODUCTS

2.01 FLOW INDICATORS

A. General

- 1. All components which will be subjected to sunlight or UV shall be UV resistant or protected. All equipment that may be subject to submergence shall be rated for submergence. This includes all enclosures, sensors, junction boxes and all other components.

B. Influent Flow Meter

- 1. Ultrasonic Influent Flow Meter for Flow Measurement through a parshall flume.
- 2. The flow meter analyzer shall be mounted on a remotely. The flow meter shall include a recorder complete with a totalizer and display and the enclosure shall meet NEMA 4X and IP65 requirements for watertight, dust tight and corrosion resistant operation. Power shall be through a power pack supplied with 120 volt AC power
- 3. Sensor shall be constructed with Molded PVC and Kynar, NEMA 4X, type 4 and resistant to high humidity environments.
- 4. Flow meter shall provide a 4-20 mA output signal transmitting the instantaneous flow rate to the SCADA.
- 5. Flow meter shall be ISCO 4210, Milltronics OCM-3, Endress+Hauser FDU91, Rosemount 3107, or approved equal.

2.02 GAS MONITORING

A. Explosive gas sensor

- 1. Two (2) explosive gas sensor indicators shall be furnished and installed to monitor the new headworks building.
- 2. Indicators shall be of a design suitable for monitoring LEL, calibrated for methane and shall include any extensions, hardware, or mountings as needed for accurately monitoring.
- 3. Transmitters shall be installed as shown on the Drawings, methane sensors shall be mounted 12" from ceiling.
- 4. Sensor shall be constructed within an explosion proof housing.
- 5. A LCD backlit display shall indicate percent LEL locally.
- 6. The sensor shall transmit the percent LEL to the control panel.
- 7. Sensors shall provide a 4-20 mA output signal transmitting the percent LEL to the WWCS system via RIO. RIO and WWCS system shall monitor and display



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INSTRUMENTATION EQUIPMENT - WWTP

the % LEL. Refer to the Contract Drawings and Section 406000 – WWCS System for details.

8. Two wire, loop powered, 12-28 VDC – The Instrumentation vendor shall include provisions within all applicable control panels for boosters to account for conductor run distances.
9. Sensors shall be Sensidyne or approved equal.

B. Oxygen gas sensor

1. Two (2) oxygen gas sensor indicators shall be furnished and installed to monitor the new headworks building.
2. Indicators shall be of a design suitable for monitoring O<sub>2</sub>, calibrated for O<sub>2</sub> and shall include any extensions, hardware, or mountings as needed for accurately monitoring.
3. Transmitters shall be installed as shown on the Drawings, approx 4-6 ft above ff elevation
4. Sensor shall be constructed within an explosion proof housing.
5. A LCD backlit display shall indicate percent O<sub>2</sub> locally.
6. The sensor shall transmit the percent O<sub>2</sub> to the corresponding pump station control panel.
7. Sensors shall provide a 4-20 mA output signal transmitting the percent O<sub>2</sub> to the WWCS system via RIO. RIO and the WWCS system shall monitor and display the O<sub>2</sub> level. Refer to the Contract Drawings and Section 406000 - WWCS system for details.
8. Two wire, loop powered, 12-28 VDC – The Instrumentation vendor shall include provisions within all applicable control panels for boosters to account for conductor run distances.
9. Sensors shall be Sensidyne or approved equal.

C. H<sub>2</sub>S sensor

1. Two (2) hydrogen sulfide gas sensor indicators shall be furnished and installed to monitor the new headworks building.
2. Indicators shall be of a design suitable for monitoring H<sub>2</sub>S, calibrated for H<sub>2</sub>S and shall include any extensions, hardware, or mountings as needed for accurately monitoring.
3. Transmitters shall be installed as shown on the Drawings, approx 4-6 ft above ff elevation
4. Sensor shall be constructed within an explosion proof housing.
5. A LCD backlit display shall indicate percent H<sub>2</sub>S locally.
6. The sensor shall transmit the percent H<sub>2</sub>S to the corresponding control panel.
7. Sensors shall provide a 4-20 mA output signal transmitting the percent H<sub>2</sub>S to the WWCS system via PLC-1. PLC-1 and the WWCS system shall monitor and display the H<sub>2</sub>S level. Refer to the Contract Drawings and Section 406000 - WWCS system for details.
8. Two wire, loop powered, 12-28 VDC – The Instrumentation vendor shall include provisions within all applicable control panels for boosters to account for conductor run distances.
9. Sensors shall be Sensidyne or approved equal.

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INSTRUMENTATION EQUIPMENT - WWTP

PART 3. EXECUTION

3.01 FLOW INDICATORS

- A. Flow meter sensors shall be installed per the manufacturer's recommendations and the Contract Drawings.
- B. Liquid level type flow sensors shall be securely mounted over the liquid being measured and shall be easily accessible.
- C. Provide insulated anchor mounts directly connected to sound concrete or other approved surface.
- D. All transmitters shall be remote and wall mounted per the Contract Drawings.

3.02 GAS MONITORS

- A. Gas monitors shall be installed per manufacturers recommendations at the locations indicated on the plans.
- B. Gas monitor mounts shall be supplied by the instrumentation vendor and shall be designed such that the sensors are easily removed from the pipe for cleaning and maintenance.

3.03 WARRANTY

A written one year standard warranty from the date of the successful equipment start-up shall be provided by each equipment supplier to guarantee that there shall be no defects in material or workmanship in any item supplied. This shall be in addition to the Warranty as required for the WWCS system.

END OF SECTION

## **Division 46**



SECTION 460050  
PARSHALL FLUME

PART 1 - GENERAL

1.1 SUMMARY

- A. Parshall Flume design and materials shall be required for the complete installation of the work.
  - 1. Provide one 9-inch flume designed for 4 MGD.
- B. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.
- C. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.2 REFERENCES

- A. Design, fabricate and Parshall Flumes and materials in accordance with manufacturer's recommended procedures and the following codes and standards:

1.	ASTM A193	-	Stainless Steel Anchor Bolts
2.	ASTM D256	-	Izod Impact Strength
3.	ASTM D570	-	Water Absorption Rate
4.	ASTM D638	-	Tensile Strength
5.	ASTM D695	-	Compressive Properties of Rigid Plastic
6.	ASTM D696	-	Coefficient of Linear Expansion
7.	ASTM D790	-	Flexural Properties
8.	ASTM D792	-	Density and Specific Gravity at 23 <sup>0</sup> C
9.	ASTM D1056	-	Polymer Grade
10.	ASTM D2583	-	Indentation Hardness
11.	ASTM D2584	-	Resin, Glass & Filler Content
12.	ISO1438/1-1980	-	Open Channel Flow Measurement

- B. Composition of the Parshall Flume laminate shall be in accordance with the recommendations shown in the Quality Assurance Report for Reinforced Thermoset Plastic (RTP) Corrosion Resistant Equipment prepared under the sponsorship of the Society of the Plastics Industry, Inc.

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PARSHALL FLUME

(SPI), and the Material Technology Institute (MTI) of the Chemical Process Industry for “Hand Lay-Up Laminates,” and shall meet the specifications for Type I, Grade 10 laminates shown in Appendix M-1 of said report.

- C. Manufacturer shall be experienced in the design and manufacture of specific Parshall Flumes and accessories for a minimum period of 20 years.
- D. Manufacturer must provide warranty for 25 years against failure due to corrosion.

1.3 SUBMITTALS

- A. Submit the following to the Engineer, in accordance with Section 013300, for acceptance.
  - 1. Approval Drawings
    - a. Showing all critical dimensions.
    - b. Showing principal parts and materials.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Ship all Parshall Flumes with suitable packaging to protect products from damage.
- B. Protect flume flanges, tabs and accessories from damage.
- C. The flume shall be stored on a smooth flat surface, free of sharp objects, and if laid horizontally shall be placed in such a way as to avoid structural damage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Flume body shall be:
  - 1. Engineered composite fiberglass reinforced plastic (FRP).
    - a. Molded in one piece to create a seamless corrosion barrier impervious to moisture.
    - b. FRP resin shall be HLU, Polyester
  - 2. Flume Hardware: T-304S/S

2.2 PARSHALL FLUMES

- A. Acceptable Manufacturers:
  - 1. Plasti-Fab Inc., or equal.
  - 2. The flume fabrication, engineering and customer support shall all be provided by the same company. Outsourcing any of these components is not acceptable.
  - 3. To assure quality control and single source accountability the same manufacturer shall fabricate and fully assemble the flume and all components.
  - 4. Or approved equal. Pre-approved by Engineer at least 10 business days prior to bid date.
    - a. Manufacturer must have a qualified Engineer on staff with at least 5 years' experience with hydraulic measurement flumes.

SECTION 460050  
PARSHALL FLUME

2.3 DESIGN CRITERIA

- A. Flume shall be dimensioned and shaped according to Dr. Ralph L. Parshall's design
- B. Composition of the Flume laminate shall be in accordance with the recommendations shown in the Quality Assurance Report for Reinforced Thermostat Plastic (RTP) Corrosion Resistant Equipment prepared under the sponsorship the Society of the Plastics Industry, Inc. (SPI) and the Material Technology Institute of the Chemical Process Industries, Inc. (MTI) for "Hand Lay-up Laminates" and shall meet the specifications for Type 1, Grade 10 laminates shown in Appendix M-1 of said report.
  - 1. Visual inspection for defects shall be made without the aid of magnification and defects shall be classified as shown in Table 1 Level II of ANSI/ASTM D2563-0, approved 1977, (or any subsequent revision).

2.4 CONSTRUCTION

- A. Flume
  - 1. Flume throat size shall be 9".
  - 2. Parshall Flume body shall be totally manufactured of fiberglass reinforced polyester.
  - 3. Each Flume shall be molded individually to the exact dimensions specified.
  - 4. The thickness of the walls and floor of the flumes 60" and larger shall be not less than 3/8" (9.5mm) thick, and 7/16" (11mm) thick at the structural flanges. The thickness of the walls and floor of the flumes 48" and smaller shall be not less than 1/4" (6mm) thick.
  - 5. Flumes shall be manufactured of reinforced thermoset plastic.
  - 6. Flume inside surface shall be smooth, isophthalic gelcoat of 10 - 20 mil (0.25 - 0.51mm) thickness for UV resistance.
  - 7. The surface shall be free of exposed reinforcing fibers.
  - 8. The minimum glass content shall be 30% exclusive of gelcoat surfaces.
  - 9. The flume shall be reinforced with box section stiffeners down the sides and across the bottom.
  - 10. The stiffeners shall be joined at the knee to form a rigid dimensionally stable flume.
  - 11. Reinforcing shall be designed to provide structural support throughout the length and width of the flume floor.
  - 12. 60" and Larger Parshall Flume body shall have 2" x 3" steel tube laminated to the bottom of the flume to provide additional stiffening for the floor. The steel tubing on the inlet and outlet end of the flume shall extend 3" beyond the side of the flume to assist the contractor in placement, leveling and tie-down of the flume during installation.
  - 13. Flume shall be structurally designed to maintain dimensional integrity with a full head of water while being free standing.
  - 14. Flume shall have a molded-in head gage with dual graduation in Left:  
Choose Type Right: Choose Type
  - 15. Stiffeners across the top shall be permanent FRP pultruded angle/channel or temporary wood spreaders as required for the job, and shall provide sufficient strength and structural support to resist the stresses that occur during shipping and proper installation of the flume.
- B. Accessories (add new, and/or delete unwanted items)
  - 1. Wing walls.
  - 2. Bulkheads.
  - 3. Sectioning.

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PARSHALL FLUME

4. Low profile.
5. Outlet removed.
6. T-304 adjustable stainless steel ultrasonic mounting bracket.
7. Pressure probe cavity with lift out bracket.
8. Inlet and / or outlet adapter with \_\_\_\_" OD pipe stub.
9. Neoprene boots with stainless steel bands for connection to \_\_\_\_" OD pipe.
10. Stilling well 12" (305mm) diameter.
11. Stainless steel sample pipe 3/8" (9.5mm) OD with molded side cavity.
12. Stainless steel bubbler pipe 1/4" (6mm) OD with molded side cavity.
13. pH probe cavity with stainless steel lift out bracket.

2.5 PHYSICAL PROPERTIES

- A. Structural characteristics for a 1/8" (3mm) glass mat laminate shall meet the following minimum physical properties:

Tensile strength	15,000 psi (1034 ksc)
Flexural Modulus	1,000,000 psi (70307 ksc)
Flexural Strength	20,000 psi (1406 ksc)
Compressive Strength	22,000 psi (1547 ksc)
Impact Strength	9.0 ft-lbs/in. (1.24 kgf.m/25mm)
Water absorption	0.13% (in 24 hours)

2.6 DIMENSIONS

- A. The flume shall conform to the physical dimensions listed in Figure 19 of the U.S. Department of Interior, Water Measurement Manual, latest edition. Dimensional tolerances for 1", 2", and 3" Parshall flumes shall be plus or minus 1/16" (1.6mm) maximum in the throat, and plus or minus 1/8" (3mm) maximum elsewhere. Dimensional tolerances for all other sizes shall be plus or minus 1/8" (3mm) maximum in the throat, and plus or minus 1/4" (6mm) maximum elsewhere.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Parshall flumes larger than 84" will be shipped in flanged and match-drilled sections along with stainless steel fasteners for onsite assembly.
- B. Verify that dimensions are correct and project conditions are suitable for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Thoroughly clean and remove all shipping materials prior to setting.
- D. Install products in accordance with plans, general comments below and the Manufacturer's recommendations.



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PARSHALL FLUME

- E. Care shall be taken in the handling, storage and placement of the flume in preparation for installation. The top spreaders shall be left on the flume until after installation is complete. They may be removed after the grout has cured if desired.
- F. The flume shall be installed level end-to-end and side-to-side, and must remain level throughout installation. Flume assembly should be set into a pre-poured block-out / channel.
- G. The contractor shall provide sufficient shoring and bracing of the floor and sidewalls to prevent lifting, floating, buckling or bulging of the sides and bottom during installation. The side locking clips are not intended to be used as anchorage points. Their function is to key the flume into the grout or concrete.
- H. Concrete shall be poured in successive lifts of not more than 6" - 8" (152-203mm) per lift. Extra care shall be exercised during the first pour to ensure that grout flows smoothly under the floor, and an even fill is achieved. The first lift shall be allowed to set so that excessive hydraulic forces are not transferred to the bottom of the flume by later lifts.

3.2 ADJUSTMENT AND START UP

- A. Check flume for being level both directions, meeting dimensional requirements and cleaned per manufacturer's instructions.
- B. **Startup / calibration of meter per section \_\_\_\_\_ (when applicable).**
- C. Site to be left clean and free of any debris.
- D. Representative shall complete a Certification of Proper Installation and provide copies to the Owner, Engineer, Contractor and Manufacturing Facility.

END OF SECTION

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PARSHALL FLUME

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SECTION 460100  
FABRICATED SLIDE GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Gear Operated Fabricated Stainless-Steel Slide Gates.
- B. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.
- C. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.2 ACTION SUBMITTALS

- A. Shop Drawings:
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include details of gate assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include diagrams for power, signal, and control wiring for the gate operator.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The fabricated stainless-steel upward opening gates shall be Series 7500 type as manufactured by WACO or equal.
- B. Gates shall be furnished with all necessary accessories and parts for a complete installation.
- C. Provide gates where indicated on the Drawings. The schedule of gates is:
  - 1. XXX (X) self-contained with bench yoke X'-0" wide by X'-X" high gear operated gates.

2.2 DESIGN

- A. Gates shall be fabricated from 316 stainless-steel to AWWA C561 for allowable leakage, structural strength and deflection requirements, and minimum dimensions.

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FABRICATED SLIDE GATES

- B. The side plate shall be ¼" minimum thickness and reinforced as required.
- C. The guide frame is fabricated from minimum ¼" thickness stainless steel structural members to resist loads imposed by the design head. The self-contained frame will require no additional reinforcing where it extends above the operating floor to support the operator.
- D. Provide a one-piece ultra-high molecular weight polyethylene (UHMW) seal.
- E. Provide a 1 ½" diameter stainless-steel rod stem. Use a safety factor of 2. Stem guides shall be supplied to support the stem as required.
- F. Provide a bench (yoke) to support the operator formed by back to back structural shapes. The bench shall be capable of supporting all loads.
- G. Provide UHMW bearing seal on all gate side frames that requires no adjustment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install gates level and plumb.
- B. Lift and support units with manufacturer's designated lifting or supporting points.
- C. Equipment Mounting per manufacturer's requirements to support the design hydraulic load.

END OF SECTION

SECTION 461000  
MECHANICAL BAR SCREEN WITH WASHER COMPACTOR

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes:

1. Providing of a front-cleaning, front-return link driven mechanically cleaned bar screen assembly and any auxiliary equipment or accessories to be installed in the location as indicated on the drawings and as specified herein.

Number of units: 2

Screen Opening Width: 3 mm

Equipment location: Class 1 Division 1 Area

2. Providing of a interleaving, dual auger washer compactor assembly as shown on the drawings and as specified herein. A single unit shall provide washing and compacting action on wastewater screenings. Related work includes:
  - a. Bar Screen
  - b. Conveyor
  - c. Receptacle
- B. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.
- C. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.2 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI)
- B. American Society for Testing and Materials (ASTM)
- C. American Welding Society (AWS)
- D. American Institute of Steel Construction (AISC)
- E. American Bearing Manufacturers Association (ABMA)
- F. American Gear Manufacturers Association (AGMA)
- G. National Electrical Manufacturers Association (NEMA)
- H. Underwriters Laboratory (UL)

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MECHANICAL BAR SCREEN WITH WASHER COMPACTOR

### 1.3 SUBMITTALS

- A. The equipment manufacturer shall submit the following items:
1. (6) Sets of General Arrangement drawings that illustrate the layout of the equipment, equipment weight, principal dimensions with related verifications required for installation including anchorage locations. Other related data including descriptive literature, Electrical Control Drawings, Catalog Cut Sheets for individual components and Drive Motor Data.
  2. A list of recommended Spare Parts including any Special Tools required for routine maintenance of the equipment is provided in Section 2.7.
  3. (6) Sets of O & M Manuals including As-Built Drawings of the Mechanically Cleaned Bar Screen Arrangement, Controls and Accessories shall be provided in digital format after equipment ship for inclusion in the Close-Out Submittal process.
  4. For sites that have three (3) ft or greater head differential, equipment manufacturer shall provide Structural Certification from licensed Civil engineer.

### 1.4 QUALITY ASSURANCE

- A. All equipment shall be fully assembled and shop tested at the manufacturing facility prior to shipment. Shop testing shall include a minimum of four (4) hours of run time. The contractor, the engineer, the owner or the owner's designated representative reserves the right to witness the shop test. A minimum three (3) week notice shall be provided prior to the test to allow for travel coordination.
- B. To assure quality and performance: All equipment furnished under this Section and related sections shall be of a single manufacturer who has been regularly engaged in the design and manufacture of the equipment and demonstrates, to the satisfaction of the Engineer, that the quality is equal to equipment made by those manufacturers specifically named herein. And the screen manufacturer shall have at least 50 installations of the specified link-driven model of mechanically cleaned bar screen equipment that has been in successful operation, at similar installations, for at least five (5) years. Upon request, the manufacturer shall provide a reference of such installation sites along with the relevant contact information.

Possible consideration may be given to manufacturers with less installation experience but only upon submission and approval of dimensional and installation drawings and O & M Manuals. Additionally, a complete product development plan with dates indicating all applicable alpha and beta testing shall be provided for review and acceptance.

Approval of any manufacturer that does not meet the installation experienced defined herein shall be contingent upon submission and approval of the previously defined information. Additionally, such manufacturers shall be required to provide a performance bond issued in favor of the owner, covering the full amount of the manufacturer's offering and for the entire warranty period of the project.

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MECHANICAL BAR SCREEN WITH WASHER COMPACTOR

- C. The equipment furnished shall be fabricated, assembled, installed and placed in proper operation condition in full conformity with approved drawings, specifications, engineering data, and/or recommendations furnished by the equipment manufacturer.

1.5 WARRANTY

- A. Manufacturer shall provide a written one (1) year standard warranty for the washer compactor and all appurtenances starting from the date of use of the mechanically cleaned bar screen equipment to guarantee that there shall be no defects in material or workmanship in any item supplied.
- B. Manufacturer shall warrant for the period of five (5) years all rotating parts of the Mechanically Cleaned Bar Screen including the gear motor, bearing, drive head, and the link system including the links, castings, pins and retaining rings. Manufacturer warrants that these components shall be replaced if damaged or defective in the normal use of the equipment.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Washer Compactor and Screens shall be as manufactured by:
- a. Duperon Corporation, 1200 Leon Scott Court, Saginaw, Michigan, TF 800.383.8479. FlexRake® Model, Full Penetration Fine Screens.
  - b. Or equal.

2.2 BASIS OF DESIGN FOR MECHANICALLY CLEANED BAR SCREEN

- A. The mechanically cleaned bar screen shall have a head sprocket only, with no sprockets, bearings, idlers, or similar drive components under water to trap the chain. Equipment featuring reciprocating rake arms or lower bearings/sprockets/tracks below the water is not acceptable.
- B. The mechanically cleaned bar screen shall meet the total screen debris removal capacity of:
- a. Total Screen Debris Removal Capacity on Low (ft<sup>3</sup>/hr) = 41.8
  - b. Total Screen Debris Removal Capacity on High (ft<sup>3</sup>/hr) = 181.2
- C. The mechanically cleaned bar screen shall be designed to run continuously (24/7), without operator.
- D. The equipment shall have multiple scrapers on the bar screen at one time cleaning continuously from bottom to top, the entire width of the bar screen. The drive output shaft rotation shall be constant and in one direction in order to reduce maintenance and increase product life. Units which have single raking arms or that require cycle times shall not be allowed. Cleaning mechanisms that utilize shock absorbers, springs or other dampening or hydraulic actuations are unacceptable.

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- E. The link system shall have jam evasion capability by flexing around and collecting large objects such as a 2 X 4, bowling ball, grease balls and surges of solids at peak loading times without overloading and shutting down the unit. The link system shall be such that it bends in one direction only which allows it to become its own lower sprocket and frame and shall have a 1,000 pound lifting capacity.
- F. Designs employing the use of endless moving media or cables and hydraulic cylinders to remove debris from the channel and units utilizing proximity or limit switches for reverse cycles are not acceptable.
- G. Equipment utilizing a greater than ½ HP motor or two or more motors to complete a screen cleaning cycle is not acceptable.
- H. The design shall be such to ensure that all maintenance can be accomplished at the operating floor level or above. No part of the drive system including sprockets shall be located below the water surface at maximum design flow.
- I. Design Conditions:

Site Installation Information:	
Channel Width:	2.0 ft
(upstream clearance) Channel Depth:	4.5 ft
Bar Opening Size:	3 mm
Angle of Installation:	30°
Average Flow:	0.9 MGD EACH
Maximum Flow:	2 MGD EACH
Equipment Location:	<i>Class 1 Division 1 Area - Indoors</i>
Debris Bin:	Yes
Conveyor:	Yes

2.3 BASIS OF DESIGN FOR WASHER COMPACTOR

- A. **Compacting Action:** The Washer Compactor shall have dual augers to provide positive displacement action. Augers shall be oriented on top of each other and rotate in opposing directions. Augers shall be intermeshed, with one left-hand and one right-hand lead. Augers shall be designed with a limited float on top of a strainer to allow for the accommodation of irregular debris.
- B. **Washing Action:** The Washer Compactor shall have a wash water manifold integrated into the main housing. Two ports inside the unit shall emit a medium pressure stream. Wash water shall run continuously when the Washer Compactor is in motion. Continuous operation (non-batching) equipment is required; filling- and batching-type equipment shall not be accepted.
- C. **Operation:** The Washer Compactor shall be continuous run, not requiring an operator. The Washer Compactor shall be equipped with a self-regulating, active pressure zone designed to accept non-standard wastewater debris in its original form, including but not limited to: rocks; broken concrete; and metal (such as bolts or short pipe) up to 4 inches long. The Washer Compactor shall have the ability to process multiple pieces of clothing, variable volumes of debris, and unprocessed septage or grease. The Washer Compactor



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shall move at a normal operating speed of 0.5 to 2.2 RPM and shall have the ability to run intermittently to sync with upstream equipment.

**D. Materials:**

- a. Fabrications:** All welded fabrications shall be made from stainless steel. All welded connections and welding procedures shall comply with AWS “Structural Welding Code – Sheet Steel” D1.3/D1.6.
- b. Select Parts:** Select power transmission parts to be made from cast iron; however, shall conform to standard coating as follows.
- c. Standard Coating:**
  - i.** Motor gearbox shall be coated in strict accordance with the paint manufacturer’s specification. Surface preparation shall be done in accordance with SSPC-SP-10 near White. The three-part coating system shall be manufactured by Tnemec as follows: Prime Coat Series 90-97 Tnemec Zinc at 2.5-3.5 mils DFT; Intermediate Coat Series Typoxy at 3.0-5.0 mils DFT; and Top Coat Series 1075U Endura-Shield II at 2.0-3.0 mils DFT. Standard color is 11SF Safety Blue. Material shall meet all State and Federal VOC and other regulatory requirements.
  - ii.** Alternatives: Any alternate product must provide certified test reports when submitting products other than those specified herein. Test reports shall indicate the test method, system, and requirements for those products being submitted and shall meet or exceed the test criteria and performance values of the coatings specified herein.
- d. Non-Metal:** Parts not covered in the specifications above shall be manufactured from UHMW polyethylene.

**E. Design Conditions:**

Washer Compactor WC3.A1.5 Data Sheet	
<b>Peak Capacity:</b>	30 cu.ft./hr (approx. 15 minutes)
<b>Average Capacity (Continuous):</b>	6.5 cu.ft./hr
<b>Wastewater Application (¼” barscreen):</b>	Up to 15 MGD
<b>Water: Typical</b>	<ul style="list-style-type: none"><li>• Utilizes filtered effluent or municipal water</li><li>• Consumes 3-10 GPM</li><li>• Requires 40-60 PSI</li><li>• ½ inch NPT supply (female threads)</li><li>• 3 inch NPT drain (male threads)</li></ul>
<b>Materials of Construction:</b>	<ul style="list-style-type: none"><li>• 304 SSTL</li><li>• 17-4 Spur Gears</li><li>• Delrin (or equivalent) thrust and plane bearings</li><li>• UHMW Auger Supports</li></ul>
<b>Strainer:</b>	<ul style="list-style-type: none"><li>• Perforated Screen</li></ul>

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<b>Performance Data (Typical Wastewater Debris)</b>	
<b>Dry Solids:</b>	30% -60%
<b>Mass/Weight Reduction:</b>	60%-70%
<b>Volume Reduction:</b>	70%-80%
<b>Odor/Fecal:</b>	Significantly decreases odor/fecal
<b>Motor/Drive</b>	
<b>Motor Size:</b>	0.75 HP
<b>Motor Paint:</b>	Standard Tnemec Coating, or equal
<b>Motor Service Factor (Minimum):</b>	1.0
<b>Output Speed:</b>	2.2 RPM
<b>Speed Reducer Ratio/Output:</b>	809:1
<b>Speed Reducer Paint:</b>	Standard Tnemec Coating, or equal
<b>Site Power</b>	
<b>Phase/Voltage:</b>	480 volt
<b>Controls</b>	
	<ul style="list-style-type: none"> <li>• NEMA 4X SSTL enclosure</li> <li>• Main Disconnect</li> <li>• Emergency Stop</li> <li>• HOA (Auto is discreet "Run" input)</li> <li>• Fwd/Jog Reverse/E-Stop Push Button Station</li> <li>• "Run" and "In Auto" discrete outputs</li> <li>• Explosion-Proof station (local standard)</li> </ul>
<b>Mounting:</b>	<ul style="list-style-type: none"> <li>• Wall</li> </ul>
<b>Project Management</b>	
<b>Submittal Quantity:</b>	3
<b>O&amp;M Manual Quantity:</b>	3
<b>Warranty Period:</b>	1 year
<b>Shipping</b>	
	<ul style="list-style-type: none"> <li>• Main unit</li> <li>• Chute(s)</li> </ul>

#### 2.4 COMPONENTS FOR MECHANICAL BAR SCREEN

- A. Bar screen assembly: Bar screen assembly shall be of stainless steel and designed to withstand 1 foot head differential unless noted otherwise in Section 2.2 J Design Conditions. Unless noted otherwise materials of construction shall be 304 Stainless Steel. A stainless steel channel bottom plate shall be an integral part of the bar screen assembly to fully engage scrapers in the bar screen at the base of the unit and assure that the raking mechanism reaches the bottom of the screen to prevent debris accumulation. The Bar screen assembly shall be shipped in one piece.

1. Screen Bars: Bars shall be 316L stainless steel and be tear-shaped with a Hydraulic Coefficient shape factor of 0.76 and the minimum dimensions of 0.25

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inch x 0.75 inch x 0.13 inch. Bars shall be individually replaceable without welding.

2. Side Fabrication: The screen framework shall be 304 stainless steel bent plate with minimum of 3/16 inch cross section.. Horizontal members shall be of stainless steel bent plate or stainless steel pipe. Support members and frame shall adequately support the bar screen based on site specific requirements.
  3. Dead Plate: Dead plate shall be 0.25 inch thick 304 stainless steel. The dead plate shall be flat and true; span the entire width of the unit; and transition from bar screen to discharge point.
  4. Discharge Chute: The discharge chute shall be 11ga. (0.12 inch) 304 stainless steel. The discharge chute shall be bolted to the dead plate and shall be designed to allow debris to be transferred from discharge point into the debris containment.
  5. Link Slides: Link slide assembly shall be provided per manufacturer standard design and shall be constructed of UV Stable UHMW PE rollers and 304 stainless steel supports and components.
- B. Return Guide/Closeouts: Return guide/Closeouts shall be 304 stainless steel and shall assure proper alignment of scrapers as they enter the bar screen and assure that there is no space wider than the clear opening between bars to prevent passage of larger solids than allowed through the screen.
- C. Debris Blade: A 304 stainless steel and UV Stable UHMW-PE debris blade assembly, which does not require a separate drive, shall be installed to assist in removing debris from the scraper on the mechanically cleaned bar screen unit as recommended by the manufacturer. Hydraulic, shock, or spring controlled debris blade mechanisms are not acceptable.
- D. Screen Enclosure: A 14ga. #4 brushed satin finish 304 SSTL Enclosure shall be installed to cover the screen above the operating deck level. Front Enclosure shall have removable panels for access to equipment. Removable panels shall be 16ga. 304 SSTL and shall be provided with knurled knobs for "no tool required" access. Alignment notches shall be included to support repositioning of removable panels. The top of the Front enclosure shall include a knock out for a customer site option to install a 6-inch diameter pipe stub. (The option of connecting to the site's exhaust system, to provide a positive air exchange from interior of enclosure, by Others.) Rear Enclosure shall have hinged removable doors and shall be secured with a lift-slide-latch handle. Rear removable door shall include an integral viewing door that shall be secured with a lift-slide-latch handle to provide access for a quick look inside.

1. Front Enclosure Design Options:

Fabrication Options:
<ul style="list-style-type: none"><li>○ <i>SSTL removable panels (standard)</i></li></ul>

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- E. Link System: The link system shall be passivated stainless steel castings and have a minimum ultimate strength of 60,000 lbs with a minimum cross section of 1.5 inches and weighing a minimum of 4.5 lbs each. Parts must meet ASTM A380 specification for surface finish.
1. 304 stainless steel system includes 302 stainless steel retaining rings and 304 stainless steel pins.
- F. Scrapers: Scrapers shall be spaced 21 inches apart. To provide long product life the scraper shall move at no greater than 28 inches per minute at standard operating speed of ½ rpm allowing for approximately 1 debris discharge per minute. Staging Scrapers and Thru Bar Scrapers shall be a maximum ratio of 3:1 per manufacturer recommendations. At least one scraper every 84 inches shall fully penetrate the bar screen, cleaning all three sides of the bars as well as through to the cross members in openings of 0.25, 0.375 and 0.50 inches.
1. Staging Scrapers; Staging Scrapers shall be 1 inch thick x 4 inches x screen width UV Stable UHMW-PE with a serrated edge.
  2. Thru Bar Scrapers: Thru Bar Scrapers shall be minimum .375 inch thick x 5 inches x screen width 304 stainless steel.
- G. Drive Head: The Drive Head shall be located at the top of the mechanically cleaned bar screen.
1. Drive Unit: Each mechanically cleaned bar screen unit shall operate independently and shall have its own drive unit and driven components.
    1. Drive Sprockets and end castings shall be cast 304 stainless steel.
    2. Drive Shaft shall be 304 stainless steel.
  - b. Gearbox shall be shaft-mounted, right angle type and include spiral bevel gearing. The output shaft speed shall be controlled by a vector type inverter or per rake manufacturer's recommendation. It shall have at least a 1.52 or greater service factor based on machine torque requirements. The gearbox shall not be vented to the outside atmosphere. The gearbox shall be grease filled. Oil filled gearboxes are not allowed.
  - c. The motor shall be AC induction type, inverter duty, 240/480 volt and mounted to the gear reducer. The motor shall be ½ hp, designed for 1800 RPMs base speed and rated for Class I, Groups C & D, Class II Groups F & G environments. The motor shall have an EPNV enclosure, NEMA design B with a 56C frame size. Service factor shall be 1.0 or greater, Class F insulation and be optimized for IGBT type inverters. The motor must be UL listed and designed for continuous operation.
  - d. Motor shall have built in, normally closed, thermostat to protect from overheating that is to be field wired to corresponding terminal in control panel for redundant (ambient) overload protection.
  - e. All drive head components shall be of components available in the United States.

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2. Bearing: Bearing shall be greased Timken tapered roller bearings, non self-aligning, dual lip sealed, lubricated, and shall have a 24/7/365 L10 life of 20 years when in compliance with stated O&M recommendations.
  3. Speed Reducer: Speed reducer shall be a double-reduction, cycloidal style and shall comply with all applicable AGMA standards. The speed reducer shall be capable of a 4/1 speed range with variable output speeds between 0.50 to 2.2 output RPMs (in high flow conditions). The speed reducer shall produce an output torque of 11,417 in.lb. and have a gear ratio of 809:1.
- H. Standard Coating: All non-stainless bar screen components shall be coated in strict accordance with the paint manufacturer's specification. Surface Preparation shall be done in accordance with SSPC-SP-10 Near White. The three-part coating system shall be manufactured by Tnemec as follows: Prime Coat Series 90-97 Tnemec Zinc at 2.5-3.5 mils DFT, Intermediate Coat Series 27 F.C. Typoxy at 3.0-5.0 mils DFT, and Top Coat Series 1075U Endura-Shield II at 2.0-3.0 mils DFT. Standard color is 11SF Safety Blue. Material shall meet all state and federal VOC and other regulatory requirements.

Alternatives: Any alternate products must provide certified test reports when submitting products other than those specified herein the specification. Test reports shall indicate the test method, system and requirements for those products being submitted, and shall meet or exceed the test criteria and performance values of the specified coatings herein.

## 2.5 COMPONENTS FOR WASHER COMPACTOR

- A. Main Housing: The main housing of the Washer Compactor shall be constructed of stainless steel (material options contained in table) with a minimum thickness of 11 gauge. Support and flange connections shall be 3/8 inch.
- B. Hopper: The hopper of the Washer Compactor shall be constructed of stainless steel (material options contained in table) with a minimum thickness of 11 gauge.
- C. Augers: The augers shall be of stainless steel (material options contained in table) with 8 inch diameter flights, 3/8 inch thick, with 4 inch flight pitch. The augers shall be coupled to a transmission at the drive end and be supported at the compaction end with UHMW plane bearings. This arrangement shall allow for the accommodation of irregular debris. The auger shaft shall be 2 inch stainless steel schedule 40 pipe with 2 inch solid stainless steel stub shaft.
- D. Compaction Housing: The compaction housing of the Washer Compactor shall be 1/4 inch stainless steel (material options contained in table) and shall house a spring and gate assembly to provide the resistance for compaction. The compaction housing shall contain the auger supports.
- E. Discharge Chute: The discharge chute of the Washer Compactor shall be constructed of stainless steel (material options contained in table) with a minimum thickness of 14 gauge. Support and flange connections shall be 1/4 inch. The discharge chute shall be tapered outward toward the discharge end.
- F. Water Supply: The water supply shall connect at a single point with a 1/2 inch NPT female connector. A NEMA 7/9 Explosion proof solenoid valve is provided to limit

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the wash water flow to only when the washer compactor is running. Ball valves shall be provided to distribute flow to the washing and trough sprayer connections.

G.     Strainer: A strainer shall be located beneath the lower auger to filter the washed solids. The strainer shall be removable via drain trough and pressed against the lower auger with spring pressure. The strainer shall be self-cleaning through continuous, even contact with the lower auger. Strainers requiring auger-mounted brushes will not be accepted.

H.     Drain Trough: A removable pan shall be provided beneath the main housing to collect washwater. Washwater shall be drained through a 3 inch NPT male drain port. The pan shall be a minimum of 11 gauge stainless steel (material options contained in table).

I.     Drive Assembly:

1.     Each Washer Compactor unit shall operate independently, with its own drive unit and driven components. The gearbox shall not be vented to the outside atmosphere.

2.     The gearbox shall be grease lubricated and designed for 5 years (or 20,000 hours of operation) between recommended clean and re-grease services. The gearbox shall be right angle type, and shall incorporate cycloidal and spiral bevel gearing with a total ratio of 809:1. The gear reducer output shaft speed shall be 0.5 RPM minimum to 2.2 RPM maximum and controlled by an AC Tech, vector-type inverter (or greater service factor) based on unit torque requirements. It shall be shaft-mounted utilizing the keyless Taper-Grip® bushing.

3.     The motor shall be mounted to the gear reducer by utilizing a quill, C-Face mounting style. The motor shall be AC induction type, 0.75 HP, 3/60/230/460 volt, explosion-proof, inverter-duty model.

4.     The drive assembly shall incorporate the Duperon® standard coating system.

J.     Auger Transmission:

1.     The Drive Assembly shall be coupled to a dual gear transmission, which drives the augers in a counter-rotation.

2.     The spur gears are contained in a stainless steel housing and supported by Delrin (or equivalent) plane bearing.

3.     Grease fittings shall be located outside of the transmission housing to provide lubrication to the gears.

K.     Speed Reducer: The Speed Reducer shall have a maximum output of 2.2 RPM, 809:1 reduction ratio with 18,900 in-lb. of output torque.

L.     Thrust Bearings: Thrust Bearings shall be Delrin (or equivalent), self-lubricating, and be capable of withstanding a minimum of 2000 lb. of thrust load (each auger) at 2.2 RPM for life of machine.

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M. Screw Supports: Screw supports shall be UHWM plane type, self-lubricating, and fastened into place using stainless steel fasteners.

2.6 ELECTRICAL, CONTROLS, INSTRUMENTATION

A. General: Controls for all equipment shall be in enclosures provided by the manufacturer. The manufacturer shall be responsible for proper sizing and function of the controls at 480V, unless specified otherwise. Note that the washer compactor controls can be integrated into the main control panel of the bar screen if provided by the same manufacturer.

1. Main control panels require shading from the sun and shall be operated within a temperature range between 35°F and 104°F. Sunshields, visors or other structures needed to provide shade are by others. (If the controls will experience temperatures outside this range, then special climate provisions are available.)
2. Controls shall be designed to accept incoming power supply per plans/specs and shall include a step-down transformer as needed to achieve 120V.
3. Control Panel(s) shall be constructed to meet the appropriate NEMA classification requirements and will include a main, lockable disconnect. The panel will be constructed by a UL certified control panel build facility and will be supported by the appropriate UL labeling.
4. Controls shall be tested prior to shipment to owner. The rake manufacturer shall verify all overload settings in the rake controller to insure proper overload and speed settings required for the application are properly programmed.
5. Control panel(s) shall be wired complete with a minimum of #16 MTW wire in the appropriate colors for the circuits being supplied. 120VAC control shall be red, grounded AC neutral shall be white, DC control shall be blue, DC neutral shall be blue with a white tracer, equipment ground shall be green and all incoming and outgoing external power source wires shall be a yellow configuration. All AC power wiring shall be a minimum of #12 Black. All wires shall be labeled at both ends with heat-shrink wire markers. Internal panel wiring shall be contained in non-flammable, covered wire way.
6. All panel(s) and panel mounted devices shall be labeled with engraved I.D. markers that reference back to the system schematics. Tags shall be white with black core, engraved as required.
7. All field wiring and power cables between the bar screen Main Control Panel and the Local Push Button Station shall be provided by others under the Electrical Section. VFD rated motor cable (Belden #29502 or equal) is recommended for all motors. Motor cables shall be less than 80 ft unless otherwise specified.

B. Components:

1. Main Control Panel

a. Enclosure(s) shall be NEMA 4X 304 SSTL.

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- b. Enclosure shall not be located in a Classified area.
  - c. Main Control Panel shall be designed with a SCCR rating of 18KA at 480VAC minimum and labeled as such, unless otherwise specified.
  - d. All terminals utilized in the main panel shall be 600V rated terminals and 20% spare terminal space shall be provided for any potential future revisions.
  - e. The Main Control Panel shall include at a minimum the following
    - Main fusible disconnect with lockable operator, unless otherwise specified.
    - Physical or virtual Hand/Off/Auto (HOA) Selector and Push/pull E-Stop button.
    - Elapsed run-time meter
    - Indication for "Power On", "Forward" and necessary faults.
    - Fused connection for the washwater solenoid.
  - f. Relay Based Controls shall include the following:
    - Variable Frequency Drive (VFD)
    - Electronic torque control
    - Hard contact SCADA Interlock(s)
    - Adjustable on/off cycle timers
2. Local Control Push Button Station
- a. Enclosure shall be NEMA 7/9 rated for Classified area installation. Local push button station must be local to the equipment to maintain requirements of local safety codes as determined by the Engineer.
  - b. Local station shall be mounted within 10 feet or as close to the equipment as safely possible and be field wired by the electrical subcontractor to the corresponding terminal inputs in the main control panel.
  - c. The remote pushbutton station shall include Forward, Jog Reverse and E-Stop buttons.
3. Instrumentation: Each raking assembly shall have a separate level system that shall be installed and field wired by others per the manufacturer's instructions. Note that the HydroRanger can be installed in the control panel or remotely and wired to the control panel.
- a. Two Level/Two Speed Control: When the lower level switch trips, the rake runs. When the upper level switch trips the rake runs at high speed. When the level switch returns to the normal position, an off-delay timer is initiated to prevent intermittent equipment starting/stopping. Cycle timing logic shall also be included that shall function in parallel with the level control for optimal rake run time.
    - a. (2) Mechanical Float Switches including 50 ft long cabling.



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4. Sequence of Operations:

- a. The Washer Compactor controls shall enable the push button station installed near the Washer Compactor when in “Hand” mode and utilize an input signal from a remote source when in “Auto” mode. Upon receiving a disruption of “remote source” signal in “Auto” mode, the Washer Compactor shall utilize an off-delay timer to allow debris to finish depositing. The washwater solenoid is energized any time that the washer compactor is running.
- b. The Duperon® Speed Controller fault shall be cleared by turning off the Washer Compactor, then waiting approximately three minutes (or time designated per current UL standards) and then turning the HOA back to the desired setting. A motor overtemp fault shall clear automatically when the motor cools to a temperature within the normal operating range.

5. Miscellaneous:

- a. The following shall be provided by the electrical contractor and are not part of the Washer Compactor manufacturer scope of supply:
  - a. Mounting stands
  - b. Mounting hardware
  - c. Field wiring and conduit
    - i. VFD-rated motor cable (Belden #29502 or equal) recommended for all motors.
    - ii. Motor cables shall be less than 80 ft. long unless specified otherwise.
  - d. Junction boxes
  - e. Installation
- b. Field wiring shall include (but not be limited to) the following connections as applicable:
  - a. All incoming power supply to the main control panel.
  - b. All required grounding of the motor and controls.
  - c. Motor to the main control panel.
  - d. VFD-rated motor cable (Belden #29502 or equal) recommended for all motors.

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- e. Motor cables shall be 80 ft. long unless specified otherwise.
  - f. Motor thermostat to the terminal inputs in the control panel.
  - g. Washwater solenoid wiring
  - h. Input and output signal wiring for remote start/stop as required by plans/specs.
- c. Remote station contacts to the corresponding terminal inputs in the main control panel.

C. Controls Design Conditions:

Incoming Power: (Voltage/Phase)	120/3
Enclosures:	Same for Multiple
Installation location:	Indoors
Approx. distance between main panel and equipment motor	See Drawings
Transducer/Float cable length	50 ft

2.6 SPECIALTY TOOLS, SPARE PARTS AND LUBRICATION

A. Manufacturer shall provide any specialty tools and recommend spare parts required for maintaining the equipment as follows:

- 1. Drive Clevis Pin (1)
- 2. Snap/Retaining Rings (10)
- 3. Link Clevis Pins (4)
- 4. Scraper Bolts (4)
- 5. Scraper Nuts (4)
- 6. Snap Ring Tool (1)
- 7. Never Seez, 1 oz. tube (1)

B. Plane Bearing Kit includes:

- 1. Side Screw Supports (2)
- 2. Upper Screw Supports (2)
- 3. Lower Screw Supports (2)
- 4. FHSCS: ¼-20 x 1.00 LG (24)
- 5. Washer: ¼ Flat SAE (24)
- 6. Nut: ¼-20 Nylock (24)
- 7. Grease Tube (14oz.) (1)
- 8. Never-Seez (1oz.) (1)

C. Manufacturer shall provide one tube of Multi-Purpose grease which is a 5-year supply of lubrication, required for maintaining all bar screen components.

D. Drop Sleeve: A flexible canvas sleeve shall be connected to the end of the Washer Compactor

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steel chute. The sleeve shall provide a guidance for dropping screenings. The sleeve shall help contain the debris as it falls and prevent debris from being scattered by the wind or otherwise impact the immediate environment. The sleeve shall be constructed of heavy-duty urethane canvas and be tethered to the surroundings as required.

PART 3 – EXECUTION

3.1 SHIPMENT

Shipment of all equipment shall be coordinated to allow the screen shipment as one complete integrated assembly unless otherwise specified by the customer, contractor, or engineer.

3.2 INSTALLATION

- A. Equipment shall be installed in strict conformance with the manufacturer's installation instructions, as submitted with Shop Drawings, Operation and Maintenance Manuals and/or any pre-installation checklists. Installation shall utilize standard torque values and be installed secure in position and neat in appearance. Installation shall include any site preparation tasks as required by the engineer or manufacturer; such as unloading, touch-up painting, etc. and any other installation tasks and materials such as wiring, conduit, controls stands as determined by the customer and/or specified by the manufacturer. All plumbing shall be completed on site by a qualified individual in accordance with all local and national plumbing regulations.
- B. Anchor Bolts: Anchor bolts and nuts shall be 304 stainless steel and furnished for each item of equipment by the CONTRACTOR.
  - 1. Anchor bolt template drawings shall be included in the submittal to permit verification of the location structural elements, new or existing in the concrete.
  - 2. Mechanical Screen anchor bolt sizes, quantity and requirements will be indicated on the submittal drawings. Quantity is site specific but typically each Barscreen assembly requires (8) to (12) 1/2" dia. x 4 1/2" Lg. embed HILTI HAS RODS w/ HIT-RE 500 V3 adhesive system anchor bolts for Mechanical Screen anchorage and typically (8) to (12) 3/8" dia. x 3 3/8" Lg. embed HILTI HAS RODS w/ HIT-RE 500 V3 adhesive system anchor bolts for the Return Guide/Closeouts anchorage.
  - 3. Washer Compactor anchor bolt sizes, quantity and requirements will be indicated on the submittal drawings. Quantity is site specific but typically each Washer Compactor assembly requires (4) 1/2" dia. x 4 1/2" Lg. embed HILTI HAS RODS w/ RE-500v3 Adhesive system anchor bolts.

3.3 TESTING

- A. After completion of installation, CONTRACTOR shall provide for testing and shall be performed in strict conformance with the manufacturer's start up instructions. Testing of

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the bar screen shall demonstrate that the equipment is fully operational by picking up and depositing materials into specified containment.

- B. Field certification for the mechanical bar screen shall include inspection of the following:
  - 1. Verify equipment is properly aligned and anchored per the installation instruction and drawings. Assure the bar screen unit is square, flat and unobstructed with required clearances maintained.
  - 2. Assure controls and instrumentation work in all modes.
  - 3. Check equipment for proper operation of debris blade, scrapers, etc as well as completion of the Start-Up requirements in the installation guide.
- C. Field certification for the washer compactor shall include inspection of the following:
  - 1. Verify Washer Compactor is properly leveled and anchored per the installation instructions and site drawings.
  - 2. Assure controls and instrumentation work in all modes.
  - 3. Assure proper auger rotation.
  - 4. Check to assure all Start-Up requirements are completed per the Installation Guide.

3.4 ONSITE TECHNICAL ASSISTANCE

- A. Manufacturer shall provide services to include Installation Certification, and shall include (1) day for Start-Up and (1) day for Training. Manufacturer shall be given minimum 14 days notification prior to the need for such services. To assure the best outcome for the Owner and Contractor, the Contractor shall provide certification for completion of the PRE-COMMISSIONING CHECKLIST.

END OF SECTION

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PART 1 GENERAL

1.01 SUMMARY

The Contractor shall provide all labor, material, tools, supervision, transportation and installation equipment to furnish and install one (1) fully operational vortex grit removal systems, complete with a grit pump, control and appurtenances as shown on the drawings and as specified herein. Additionally, the Contractor shall furnish all labor, material, tools, supervision, transportation and installation equipment to furnish replacement parts, rebuild and relocate one grit cyclone classifier.

B. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.

C. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.02 REFERENCES

A. The vortex grit removal system shall, as applicable, meet the requirements of the following industry standards:

1. American Gear Manufacturers Association (AGMA)
2. International Electrotechnical Commission (IEC)
3. American Institute of Steel Construction (AISC)
4. American Society for Testing and Materials (ASTM)
5. American Welding Society (AWS)
6. American Society of Civil Engineers (ASCE)
7. Steel Structure Painting Council (SSPC)

B. Controllers shall, as applicable, meet the requirements of the following Regulatory Agencies.

1. National Electrical Manufacturer's Association (NEMA) Standards
2. National Electrical Code (NEC)
3. Underwriters Laboratory (UL and cUL)

1.03 SUBMITTALS

A. Shop Drawing(s)

Supplier shall submit six (6) sets of shop drawings. Shop drawings shall include equipment descriptions, specifications, dimensional and assembly drawings, parts lists, and job specific drawings as follow:

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1. Certified shop and erection drawings showing important details of construction dimensions, anchor bolt locations, and field connections.
2. Descriptive literature, bulletins, and catalogs of the equipment, including details of the motor, gear reducer and lubrication points.
3. Installation, operation, and start-up procedures including lubrication requirements.
4. Complete motor data.
5. A list of spare parts that are supplied with the equipment.

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B. Operation and Maintenance Manuals

Supplier shall submit three (3) sets of Operation and Maintenance manuals. The manuals shall include contact information of service representatives, equipment descriptions, operating instructions, complete mechanical and electrical drawings, troubleshooting techniques, a recommended maintenance schedule, and the recommended lubricants.

1.04 QUALITY ASSURANCE:

- A. All equipment furnished under this Section shall be of a single manufacturer who has been regularly engaged in the design and manufacture of the equipment and demonstrates, to the satisfaction of the Engineer, that the quality is equal to equipment made by those manufacturers specifically named herein. The system manufacturer shall have supplied a minimum of ten (10) vortex grit removal systems that has been in successful operation, at similar installations, for at least five (5) years.
- B. The equipment furnished shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with approved drawings, specifications, engineering data, and/or recommendations furnished by the equipment manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

- A. The equipment shall be packaged in containers constructed for normal shipping, handling and storage.
- B. The CONTRACTOR shall store and temporarily support equipment prior to installation in strict accordance with the Manufacturer's recommendations and instructions. Protect all exposed surfaces. Keep records of the storage parameters and the dates that storage procedures were performed. The CONTRACTOR shall be responsible for work, equipment, and materials until inspected, tested and finally accepted.
- C. Protect the equipment from being contaminated by dust, dirt, vibration and moisture.
- D. The unit shall be erected and lubricated in strict accordance with the instructions of the Manufacturer.

1.06 IDENTIFICATION

Each unit of equipment shall be identified with a corrosion resistant nameplate, securely affixed in a conspicuous place. Nameplate information shall include equipment model number, serial number, supplier's name, and location.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. The physical layout of the system as shown on the contract drawings and the equipment specified herein are based upon the model, RAPTOR SpiraGrit as manufactured by Lakeside Equipment Corporation of Bartlett, IL. The use of this system does not remove any responsibility of the Contractor to verify dimensions and elevations to ensure the

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equipment will fit within the proposed building and equipment configurations. The use of any system other than the RAPTOR SpiraGrit system will require the manufacturer to provide a modified layout subject to the approval of the ENGINEER. The grit removal system supplied shall be in compliance with these specifications and plans and shall be supplied by one of the following manufacturers:

1. Lakeside Equipment Corporation
2. Westech
3. Smith and Loveless

- B. If the CONTRACTOR proposes an “or equal” system, it shall be understood that the proposed system meets or exceeds the specified performance and construction and offers a cost savings to the OWNER. The CONTRACTOR may be responsible for engineering time to review proposed substitutions.

2.02 GRIT REMOVAL EQUIPMENT

A. PERFORMANCE REQUIREMENTS

1. The grit removal system shall be engineered to meet the following requirements at up to the maximum grit chamber hydraulic capacity of 5.0 mgd.
  - Remove 95% of grit greater than 50-mesh in size.
  - Remove 85% of grit greater than 70-mesh in size.
  - Remove 65% of grit greater than 100-mesh in size.

The efficiency level relates to grit having a specific gravity of 2.65 and to the difference in grit content in the influent channel as compared to that of the effluent in the effluent channel.

2. The grit cyclone-classifier shall be designed to receive and convey up to the maximum grit slurry as noted below.
3. The general grit removal equipment shall be designed as follows:
  - Number of Vortex Units: One (1)
  - Number of Grit Pumps: One (1)
    - The grit pump controls shall be provided as part of this section while the grit pump itself shall be provided via a separate specification section)
  - Number of Grit Cyclone Classifiers: One (1)
  - Design Average Daily Flow: 1.80 MGD
  - Electrical Power Available: 480/60/3
  - Area Classification: Class 1, Div. 1, Group D  
(does not apply to the main control panel)
4. The vortex grit chamber shall be designed as follows:



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- Maximum Flow Capacity / Unit: 5.0 MGD
- Grit Chamber Inside Diameter: 8.0 Feet
- Grit Hopper Inside Diameter: 3.0 Feet
- Grit Chamber Drive Motor Size: 1 HP
- Grit Chamber Max. Operating RPM: 20 RPM
- Drive Tube Nominal Diameter: 10"
- Grit Suction Diameter: 4 Inches
- Grit Fluidizing System – Max. Flow Rate: 20 GPM
- Grit Fluidizing Pressure – Max Pressure: 50 PSI
- The gear box and motor shall be mounted on a stainless steel frame (frame supplied as part of this specification section) which raises the gear box and motor above the 100-year flood elevation of 13.5'. Additionally, the grit vortex manufacturer shall be responsible for designing and furnishing a drive shaft, complete with a lower bearing at the vortex unit itself and a drive shaft guard which extends from the vortex unit gear box to the vortex unit on the lower floor. Refer to the Contract Plans for details.

5. The controls, complete with the VFD and thermos protection, for a self-prime grit pump shall be provided as part of this section, with pump designed as follows:

- Pump Capacity: 250 GPM
- TDH: 43 Feet
- Motor Size: 10.0 HP

6. The Type W grit cyclone-classifier manufactured by Lakeside Equipment Corporation. This cyclone-classifier shall be rated as follows:

- Maximum Feed Rate: 250 GPM
- Cyclone Inlet Diameter: 4 Inches
- Cyclone Overflow Diameter: 6 Inches
- Class. Speed Reducer Torque Rating: 15,700 in-lbs
- Class. Speed Reducer Thrust Rating: 5,800 lbs
- Classifier Motor Size: 1 HP
- Classifier Incl. Angle: 16°
- Grit Conveying Capacity: 35 Ft<sup>3</sup>/hr

**B. MATERIALS QUALITY**

1. All fabricated components of the vortex grit chamber and grit cyclone-classifier shall be AISI Type 304 stainless steel. Materials thicknesses identified herein are the minimum requirements for this project. Materials with increased thicknesses will be acceptable.

**C. VORTEX GRIT CHAMBER EQUIPMENT**

1. General

- a. The vortex grit chamber shall be a 360-degree design configuration.

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- b. The vortex grit chamber shall have the dimension as noted in paragraph 2.02.A.4.

2. Drive Assembly

- a. The grit removal drive mechanism shall consist of an electrical motor, a helical reduction unit, and an enclosed final reduction unit consisting of one pinion and an integral gear/bearing. All components are directly coupled, eliminating the use of chains and V-belts. The drive mechanism shall not be overloaded under normal operating conditions and shall be designed for heavy duty 24 hour per day service.
- b. The external tooth gear shall be an external gear/bearing unit such as manufactured by Rotek, Inc., Kaydon, Inc., or equal. The gear teeth shall be AGMA grade 6 or higher. The gear teeth shall have a core hardness of 250 to 300 BHN, and shall be induction hardened to a surface hardness of 52 to 60 Rc. The bearing raceway shall be hardened to 58 to 60 Rc, precision ground and have a minimum 20.5-inch ball path diameter. The main bearing shall be oil bath lubricated and have an AFBMA theoretical L10 design life in excess of 100 years. The main bearing shall have a seal to prevent contamination of the bearing raceway.
- c. The final reduction pinion shall be made of heat-treated alloy steel and shall be mounted on the output shaft of the reduction gearbox. The gear teeth shall have a core hardness of 300-350 BHN, and shall be induction hardened to a surface hardness of 52 to 60 Rc.
- d. The final reduction pinion and main gear shall have a service factor of 5.0.
- e. The helical reduction unit shall drive the pinion of the final reduction unit. The helical reduction unit shall have a minimum service factor of 2.0. The helical reduction unit bearings shall have an AFBMA theoretical L10 design life in excess of 100,000 hours.
- f. The speed reducer shall be driven by a NEMA C-flanged, 1,800 rev/min, ball bearing, continuous-duty, totally-enclosed, fan-cooled motor with leads to a large conduit box for outdoor operation.
- g. The motor shall be UL rated for operation in Division 1, Class 1, Group C & D environments. The motor shall be a minimum 1.0 horsepower with a service factor of 1.15. Electrical characteristics shall be 460 volt, 3 phase, 60 Hertz, Class F insulation, continuous duty rated. Explosion-proof motor shall be furnished with over-temperature thermostats in the windings designed for cut-out at approximately 160 degrees C.
- h. The fabricated and machined final reduction unit housing shall be manufactured of A36 steel plate or cast iron. All welds shall conform to applicable specifications of the American Welding Society (AWS). After welding, all mounting and mating surfaces shall be machined to insure proper fit and alignment of the drive pinion and mating gear.
- i. The final reduction unit housing shall be designed to prevent water from entering the housing in case of flooding by means of an air bell.

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- j. The drive assembly shall be mounted on a grit equipment vendor supplied 304 stainless steel frame which will extend the motor and gear box above elevation 13.50'. See the Contract Plans for additional requirements.
3. Drive Tube and Drive Shaft
- a. The drive tube shall be driven by the main spur gear. The drive tube shall have a minimum nominal diameter of 10 inches and shall have a minimum wall thickness of 1/4-inches. The drive tube shall be Schedule 10S stainless steel pipe construction.
  - b. The drive shaft shall extend from the upper level to the top of the vortex unit on the lower level. The shaft shall be stabilized by a lower bearing located at the vortex unit in the lower level. A drive shaft guard, constructed of stainless steel and meeting all OSHA safety requirements shall be provided. This guard shall extend from the upper level and shall encompass the lower steady bearing and ensure that no accident contact with the drive shaft is possible.
  - c. The impeller shall be stabilized with a lower steady bearing that is mounted on the lower operating floor as shown on the drawings. The bearing shall be a flanged split roller bearing to allow for ease of field replacement. The bearing shall have a minimum AFBMA L-10 theoretical design life of 100,000 hours. The rotating paddle assembly shaft shall be provided with a stainless steel guard per OSHA standards.
4. Paddle Assembly
- a. The paddle assembly shall consist of four (4) fixed propeller blades. The propeller blades shall be affixed to the drive tube by means of a two (2)-piece collar. The collar shall allow adjustment of the propeller assembly in either an upward or downward position to ensure maximum grit removal.
  - b. The paddle blades shall be tapered with ample rounded leading edges and a fixed pitch of 45 degrees. The paddle assembly shall be stainless steel construction.
5. Floor Plate
- a. To minimize the possibility of organic capture, the grit collector shall have a 1/2-inch thick stainless steel floor plate in the grit chamber. The floor plate shall consist of two (2) removable sections to allow access to the grit storage hopper.
6. Inlet Baffle
- a. A 1/4-inch thick stainless steel baffle shall be furnished at the inlet channel to optimize the chamber's hydraulic conditions.
7. Grit Fluidizing System
- a. The grit fluidizing system minimum water flow rate shall be as noted in paragraph 2.02.A.4.

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- b. The water fluidizing system shall be furnished to free the organics that have settled in the grit well. The water fluidizing system supply line shall include a 1-1/2 inch diameter manual stainless steel ball valve and a 1-1/2 inch diameter solenoid valve for water flow control.
- c. Solenoid valve shall be brass body suitable for 120 VAC operation with a rating of 50 GPM. Solenoid valves shall be normally closed and rated for up to 100 psig. Solenoid valves shall be slow close type to minimize water hammer. Solenoid valves shall be rated for operation in a Class 1, Division 1, Group C & D environments.
- d. A plant water filter. Keller Filter Products Model 151A, or equal, shall be provided suitable for a 1-inch connection and a maximum flow rate of 50 gal/min with a maximum pressure drop of 2 psig and shall be suitable for a maximum pressure of 125 psig. Water filter shall be a dual stacked filter element design with washable 80-mesh (200 micron) polyethylene or polypropylene disc elements, polypropylene head and bowl and Buna N gaskets. Y-type strainers shall not be acceptable for this project.

E. GRIT CYCLONE AND CLASSIFIER

1. Grit Cyclone

- a. neoprene cyclone liners and Ni-Hard vortex finder.

2. Grit Classifier

- a. Provide a wash water supply system shall be provided in the side of the existing classifier tank to provide supplemental grit washing. The wash water supply system shall include a 3/4-inch diameter minimum, brass body solenoid valve suitable for 120 VAC operation and rated for operation in Division 1, Class 1, Group C & D environments. Solenoid valves shall be normally closed and rated for up to 100 psig. Solenoid valves shall be slow close type to minimize water hammer. A ball valve shall be provided. Ball valve shall be 3/4-inch diameter, 1/4-turn, stainless steel body with stainless steel ball and Teflon seats, and shall have an adjustable stop handle for volume control of the grit wash system. A plant water filter shall be provided suitable for a 3/4-inch connection and a maximum flow rate of 25 gal/min and suitable for a maximum pressure of 125 psig. Water filter shall be a stacked filter element design with washable 80-mesh (200 micron) polyethylene or polypropylene disc elements, polypropylene head and bowl and Buna N gaskets. Y-type strainers will not be acceptable for this project.

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F. CONTROLS AND INSTRUMENTATION

1. General

- a. All controls necessary for the fully automatic operation of each vortex grit removal system, grit pump, and grit cyclone-classifier shall be provided in accordance with IEC standards.
- b. A PLC shall be used to control the grit fluidizing system solenoid valve, grit pump, grit cyclone-classifier, and the classifier grit washing solenoid valve. The grit cyclone-classifier shall be electrically interlocked to the operation of the grit fluidizing system solenoid valve, the grit pump, and the classifier grit washing system solenoid valve.

2. A main control panel shall be provided which shall operate the vortex grit systems and shall include the following items:

- a. Door interlocked fused disconnect
- b. Allen-Bradley MicroLogix 1400 programmable logic controller (PLC) with built in Ethernet communication capabilities. The control panel shall be complete with relays and timers to monitor equipment-mounted electrical devices and to perform necessary logic functions.
- c. An Allen Bradley PanelView+6 (700) TouchScreen OIT, 6.5-in. color display with Ethernet shall be mounted on front door of the main control panel.
- d. Motor starters for the following:
  - Vortex grit stirrer drives
  - Grit classifier drives
- e. Variable frequency drive (VFD) with line reactor for the grit pump
- f. Thermo protection for the grit pump.
- g. Control power transformer fused primary and secondary with 120 VAC transient voltage surge suppressor (TVSS)
- h. Full voltage LED pilot lights for the following:
  - Control power on (White)
  - One grit stirrer run (Green)
  - One grit fluidizing system RUN (Green)
  - One grit pump run (Green)
  - One Grit Classifier run (Green)
  - Classifier grit washing system RUN (Green)
  - One Multifunctional overload shutdown grit stirrer - grit pump - classifier fault ALARM (Red)
  - One grit pump high temperature (Red)
  - One grit pump moisture sensor (Red)
- i. Door-mounted non-resettable elapsed time meters for the following:
  - Grit stirrer drives
  - Self-priming grit pump drives
  - Grit classifier drives
- j. One (1) set of spare fuses of each size and type

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- k. White phenolic nameplates with black lettering
  - l. 600 VAC terminal block
  - m. U.L. 508 label
2. A local-mounted operator control station for the vortex grit system and grit pump shall be mounted adjacent to the equipment (on the upper level above elevation 13.50') and shall contain the following items and shall be configured to allow for HAND operation of the equipment completely independent of the PLC or the plant SCADA:
- a. HAND-OFF selector switch for the vortex system grit stirrer drive
  - b. Hand-Off-Auto selector switch for each of the following:
    - Grit pump
    - Grit fluidizing solenoid valve
  - c. E-Stop Push Button
  - d. White phenolic nameplates with black lettering
  - e. NEMA 4/7/9 4-hole cast aluminum explosion-proof enclosure
3. A local-mounted operator control station for the grit cyclone-classifier shall be mounted adjacent to the equipment and shall contain the following items and shall be configured to allow for HAND operation of the equipment completely independent of the PLC or the plant SCADA:
- a. HAND-OFF -Auto selector switch for each of the following:
    - Grit classifier drive
    - Classifier grit washing system solenoid valve
  - b. E-Stop Push Button
- a. White phenolic nameplates with black lettering
  - b. NEMA 4/7/9 4-hole cast aluminum explosion-proof enclosure
4. Control Strategy
- a. The main control panel shall fully operate the each grit removal system as follows:
    - With the selection of the AUTO mode at the associated grit pump, grit fluidizing system, grit classifier and grit washing system, the main control panel shall initiate a run cycle based on an operator set timer. The number of starts per hour and the run duration shall be set by the operator via the main control panel OIT.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

Installation shall be installed in strict conformance with the manufacturer's installation instructions, as submitted with Shop Drawings, Operation & Maintenance Manuals and/or any pre-installation checklists. Installation shall utilize standard torque values and be installed secure in position and neat in appearance. Installation shall include any site preparation tasks, pre-installation tasks as determined by the manufacturer; such as unloading, touch-up painting, etc. and any other installation tasks and materials such as wiring, conduit, controls stands, as determined by the customer and/or specified by the

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manufacturer.

3.02 FIELD QUALITY CONTROL

A. Operational Test

1. Prior to acceptance by OWNER, formal start-up and testing of all equipment and control systems shall be conducted by the CONTRACTOR, in the presence of the ENGINEER and a representative of the equipment vendor, to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

B. Manufacturer Training

1. A representative of the of the vortex grit removal system supplier shall, at the successful completion of start-up provide one day of on-site training for the operators and shall demonstrate the basic operation and maintenance procedures. This training may not be conducted until such time that all start-up and testing has been successfully completed. The vendor is cautioned that these training sessions must be scheduled in advance and have prior approval to be considered completed.

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2. Follow-up service: The manufacturer's representative shall return to the facility at the end of the Warranty period to address any operational issues which have arisen. This inspection does not eliminate the possible need for the representative to return sooner if equipment problems arise.

3.03    WARRANTY

A written one year standard warranty from the date of the successful equipment start-up shall be provided by the equipment supplier to guarantee that there shall be no defects in material or workmanship in any item supplied.

3.04    SPARE PARTS

The Contractor shall furnish the following spare parts in clearly identified containers:

Provide for each grit removal system shall be provided with the following spare parts

1.    One (1) set of liners for the grit cyclone
2.    One (1) grit classifier lower bearing, stainless steel wear sleeve, and seal set
3.    One (1) grit fluidizing system solenoid rebuild kit.
4.    One (1) classifier grit washing system solenoid valve rebuild kit

END OF SECTION



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SECTION 461180  
ODOR CONTROL SYSTEM

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Provide a pre-engineered Odor Control System as hereinafter specified.
- B. Provide two (2) odor control units.
- C. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.
- D. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.02 WARRANTY

- A. All equipment supplied under this Section of the Specifications shall be warranted for a period of one (1) year from date of start-up.
- B. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be repaired or replaced and the system restored to service at no expense to the Owner.

1.03 DESCRIPTION OF SYSTEM

- A. The Contractor shall provide a complete, pre-engineered Odor Control System. The Manufacturer of the Odor Control System shall be responsible for the design and fabrication of the complete system within the limits specified herein. Installation shall be the responsibility of the contractor as described and as specified.
- B. The following minimum design parameters shall be incorporated into the Manufacturer's design:
  - 1. Average influent concentration: 5 ppm hydrogen sulfide
  - 2. Airflow rate: 1,500 SCFM
  - 3. Removal rate: >99% H<sub>2</sub>S
  - 4. Design carbon life: >1 year

1.04 QUALITY ASSURANCE

- A. To assure unity of responsibility, all equipment and material specified in this Section of the Specifications shall be furnished and coordinated by the Odor Control System Manufacturer.

1.05 SUBMITTALS

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ODOR CONTROL SYSTEM

- A. Copies of all materials required establishing compliance with the specifications shall be submitted to the Owner's Consulting Engineer in the form of a booklet or binder. Submittals shall include at least the following.
  - 1. Plan view drawing showing arrangement of treatment units and associated ductwork.
  - 2. Product drawings and cutsheets, descriptive literature, bulletins and catalogs on all equipment including but not limited to the following.
    - a. Detailed physical drawings of the treatment units to include all external piping connections and associated sizes, and materials of construction.
    - b. Electric schematic diagrams indicating necessary field connections.
    - c. Product data sheets for the blower and drive motor including performance curve with operating point and data.
    - d. Specification data for the activated carbon media.
- B. List all exceptions taken to the specifications along with backup documentation as to why the exception has been taken. In the event that it is impossible to conform to certain details of the Specifications due to different manufacturing techniques, describe and justify completely all non-conforming aspects.
- C. Provide three (3) copies of the O&M manuals.

1.06 PRODUCT HANDLING

- A. All equipment items shall be properly protected so that no damage or deterioration will occur from the time of shipment until installation is completed and the units and equipment are ready for operation.
- B. All exposed blower and equipment openings shall be protected.
- C. Proper care shall be taken to protect mechanical parts from the entrance of water during shipment, storage, and handling.
- D. Each box or package shall be properly marked to show its contents.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All equipment furnished shall be new and suitable for the conditions of service to which they will be subject. Workmanship shall be of the highest quality and shall be carried out by competent and experienced workmen. All parts shall be protected so that no damage may occur during a long delay from time of shipment to time of completion of installation.
- B. The Odor Control System shall be manufactured by Advanced Carbon Systems, Saugerties, NY, or equal.

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ODOR CONTROL SYSTEM

- B. Operating Conditions - The odor control system shall be suitable for long-term operation under the following operating conditions.

1.	Duty:	Continuous
2.	Ambient environment:	Outdoor
3.	Ambient Temp. (°F):	-20 to 100
4.	Project site elevation (ft. MSL):	278
5.	Total air flow (SCFM):	1500 (each system)
6.	Average influent H <sub>2</sub> S conc. (ppm):	5
7.	Maximum influent H <sub>2</sub> S conc. (ppm):	50
8.	Removal required (%):	>99.9% H <sub>2</sub> S

2.02 CARBON ABSORPTION VESSEL

- A. The adsorber vessel shall be constructed of vinyl-ester fiberglass reinforced plastic (FRP) with white, UV-resistant, exterior gel coat. Vessels made of polypropylene or polyethylene will not be considered. The vessel shall contain an internal carbon support structure fabricated of 1.5" thick FRP grating with polypropylene carbon retention screen and two 8" support beams. It shall have a bottom inlet and top mounted outlet. The vessel shall have a flanged 30" manway with 316 SS hardware for carbon replacement access. Four FRP anchoring lugs shall be included to secure the vessel to the slab.

- B. Design - The carbon adsorption vessel shall meet the following design criteria:

1.	Number of vessels (minimum):	2 (1 per skid)
2.	Minimum diameter (in):	72
3.	Maximum height (in):	80
4.	Depth of carbon (in):	36
5.	Inlet flange size (in):	12
6.	Outlet rain hat size (in):	12
7.	Air loading rate (maximum CFM/ft <sup>2</sup> ):	55

2.03 ACTIVATED CARBON

- A. The carbon vessel shall be filled with two layers of carbon with a total of 2,200 lbs of virgin activated carbon.
- B. The bottom of the carbon bed will be supplied with 1,100 lbs of high H<sub>2</sub>S removal carbon. The carbon shall meet the following design criteria .
- |    |   |          |
|----|---|----------|
| 1. | H <sub>2</sub> S Capacity (ASTM D6646), g/mL: | 0.3 min. |
| 2. | Moisture, % as packed                         | 8 max.   |
| 3. | Carbon pellet diameter                        | 4 mm     |

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4. Apparent Density, g/mL 0.46

- C. The top of the carbon bed will be supplied with 1,100 lbs of 4x8 mesh, CTC 60 Coconut Shell carbon to remove organic odors such as mercaptans, DMS and DMDS.

2.04 GREASE FILTER

- A. The grease filter shall remove grease aerosol from the air stream at the inlet of the system. It protects the blower and carbon from problems caused by grease ingestion. The grease filter shall consist of a stainless steel mesh pad in a FRP housing. The design shall allow easy removal, inspection and cleaning of the reusable mesh pad.

- B. Design - The grease filter shall meet the following design criteria:

1.	Number of units:	2 (1 per skid)
2.	Maximum air flow (SCFM):	1500
3.	Maximum pressure drop (IWG):	<0.5
4.	Maximum air velocity (ft/min):	450

2.05 CENTRIFUGAL BLOWER

- A. The blower shall be, non-overloading, centrifugal design with a polypropylene housing and impeller. The blower shall be directly coupled to the drive and mounted on a common base.

- B. Drive - The drive shall be a heavy duty, Totally Enclosed Fan Cooled (TEFC), AC, 230 V, 3 phase, 60 Hz, 3450 RPM electric motor. The motor shall have a 1.15 SF, class F insulation and sealed bearings. The motor shall be manufactured by Baldor, or equal.

- C. Design - The fan shall be designed to meet the following criteria:

1.	Number of fans:	2 (1 per system)
2.	Capacity at design conditions (SCFM):	1500
3.	Static suction pressure (in. of water):	1
4.	Discharge pressure (in. of water):	6
5.	Maximum inlet temperature (°F):	105
6.	Blower Speed, max. (RPM):	3450
7.	Motor size, min. (HP):	3
8.	Inlet size (in.):	8
9.	Outlet size (in.):	8

2.06 ALUMINUM SKID

- A. The system shall be fully assembled and mounted on an aluminum skid. The skid shall be engineered to support the equipment with a safety factor of 3. All structural connections shall

SECTION 461180  
ODOR CONTROL SYSTEM

be of continuous weld with a minimum of ¼" fillet. The top surface shall be non-skid type and stitch welded to the structural beams. Each corner shall have a lifting lug and an anchoring lug.

2.07 RESERVED

2.08 CONTROLS

- A. VFD - The system shall include a 3 HP, variable frequency drive that allows adjustability of the system air flow by control of the blower speed. The VFD shall be mounted inside a ventilated NEMA 3R enclosure and supported by a pedestal mounted to the skid.

2.09 INSTRUMENTATION

- A. The manufacturer shall provide differential pressure gauges to monitor pressure drop across the pre-filter and the carbon beds. The gauges shall be Magnahelic® Model 2005 by Dwyer Instruments, or equal.

2.10 PROCESS STREAM DUCTWORK

- A. All ductwork, duct supports and other related supplies shall be provided by the manufacturer and installed in accordance with the drawings. All process stream ductwork to be schedule 40 PVC. Ductwork that is exposed to sun light shall be painted to prevent UV deterioration. Sizes shall be as shown on the drawings.

2.11 SYSTEM WIRING

- A. All wiring, conduit, junction boxes and other related supplies shall be provided by the manufacturer and installed in accordance with the Engineer's recommendations. Conduit shall be outdoor rated schedule 80 PVC type with approved weather tight connections. All wiring shall be in accordance with National Electrical Code (NEC), and all other related local electrical and fire codes requirements.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation by the contractor of each equipment item shall be in strict accordance with the Engineer's and manufacturer's instructions and recommendations in the locations shown on the drawings. The manufacturer shall provide one day of on-site supervision for the installation of the equipment. All cost for the installation shall be borne by the Contractor.

3.02 INSPECTION, START-UP, AND OPERATOR TRAINING

- A. A representative from the Manufacturer shall be present to perform the required inspection, start-up, and operator training services for the system. The contractor shall schedule this service with the Manufacturer's representative and his intended system operators.

3.03 TESTING

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ODOR CONTROL SYSTEM

- A. After all equipment has been completely installed according to the direction of the Manufacturer and conducted in the presence of the Owner, tests shall be performed to indicate that the System operates satisfactorily and will meet the design criteria set forth in Section 1.03 B of the Specification. Visual inspection will be made at this time for any discrepancies, which shall be corrected. The field test shall demonstrate correct mechanical operation after system start-up. Field tests shall include all equipment included under this section.

END OF SECTION

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SECTION 461190  
TRICKLING FILTER

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide trickling filter media and rotary distributor as specified in this section.
- B. All equipment supplied under this section shall be furnished by or through a single Manufacturer who shall coordinate with the Contractor, the design, fabrication, delivery, installation and testing of the equipment. The Contractor shall have the sole responsibility for the coordination and performance of all components of the equipment with the performance and design criteria specified herein.
- C. The Contractor shall be responsible to coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. The Contractor shall be responsible for all structural and other alterations in the Work required to accommodate the equipment differing in dimensions or other characteristics from the Contract Drawings or Specifications.

1.2 MATERIAL OF CONSTRUCTION FOR ROTARY DISTRIBUTOR

- A. Center column, support truss, tub and tie rod will be HDG.
- B. Hardware, anchor bolts/fasteners and other miscellaneous materials items will be 304 SS.

1.3 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 013300, copies of all materials required to establish compliance with the Section. Submittals shall include at least the following:
  - 1. Certified shop and erecting drawings showing all important details of construction, dimensions, weld requirements and anchor bolt locations.
  - 2. Descriptive literature, bulletins and/or catalogs of the equipment.
  - 3. A complete total bill of materials for all equipment.
  - 4. Complete description of surface preparation and shop prime painting.
  - 5. Certified copies of field test report.

1.4 QUALITY ASSURANCE

- A. Only the equipment of a manufacturer of the type described in this section of the specifications, which has been in actual service at least five years shall be considered.
- B. Manufacturer's Field Reports
  - 1. Carefully inspected all fabrication at the site of fabrication by factory inspectors.
  - 2. Use inspection means necessary to assure the proper fit of all field connections and compliance with all material and fabrication requirements of the specifications.



SECTION 461190  
TRICKLING FILTER

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping

1. Deliver all pieces in the largest pieces practical for field assembly by the Contractor.
2. Permanently tag individual pieces with welded erection marks or stainless-steel tags to cross reference with information on the Manufacturer's erection and assembly drawings.
3. Protect mechanical components from the weather and package suitably to facilitate handling and storage.

1.6 FIELD SERVICE

A. B. Services of the Manufacturer's Representative

1. The manufacturer shall furnish an engineer experienced in the erection, alignment and operation of the equipment furnished and this section for a minimum of 1 day to supervise the erection and adjustment of the equipment and to certify its readiness for operation. Each day shall include a full 8-hour working day on the project site, travel time shall be additional to these requirements.
2. The manufacturer's engineer shall be present at:
  - a. Frequent intervals to ensure proper erection and satisfactory operation of equipment,
  - b. Beginning of uncrating, assembly, and installation
  - c. Final installation and alignment.
3. A factory representative who has complete knowledge of the proper operation and maintenance of the equipment furnished shall be provided for 1 day as defined above, and in addition to the days required above, to instruct representatives of the Owner and the Engineer on proper operation and maintenance of the equipment after the final operational test is successful, and the operation and maintenance manuals have been furnished and approved.

PART 2 - PRODUCTS

2.1 GENERAL DESIGN

- A. The trickling filter media and rotary distributor specified in the section shall be an EIMCO-KCP Rotary Distributor as provided by Rebuild-it Services Group (RSG), or equal.

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Details</u></b>
1	Internal Diameter of the Trickling Filter	40 feet
2	Quantity (Nos)	Two (2)
3	Type of Mechanism	Central Driven Type
4	Efficiency of filters (%)	87%
5	Maximum flow	1,388 gpm
6	RPM (min/max)	0.75 to 1.5
7	No of arms	2

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TRICKLING FILTER

- B. Description
1. The rotary distributors shall be suitable for evenly distributing typical screened, de-gritted, and settled wastewater onto trickling filter media.
  2. The rotary distributor shall be rotated by reaction forces of fluid flowing through orifices and shall operate freely over the entire design flow range. Arms shall be sized for the maximum liquid velocity listed.
  3. Distributors shall be designed such that the two arms are in operation and capable handling high flows; a drive mechanism shall be in place to keep the rotary turning during low flow operations. The head, as measured from the top of the filter media to the water level in the center barrel, shall not exceed the specified maximum operating head at the maximum flow rate.
- C. Drive unit shall be hydraulic with no motor.
- D. Materials: All structural steel shall conform to the requirements of ASTM A36. Steel pipe used for structural members shall conform to ASTM A 53. Steel members in contact with liquids either continuously or intermittently, shall have a minimum thickness of 1/4-inch. All aluminum shall be type 5052, 6061, or 6063 alloy unless noted. Stainless steel shall be per ASTM A240, stainless steel pipe shall be per ASTM A312.
- E. Fabrication: Shop fabrication and welding of structural members shall be in accordance with the latest edition of the "Structural Welding Code", AWS D 1.2 for aluminum, of the American Welding Society. All welded connections shall develop the full strength of the connected elements and all joined or lapped surfaces shall be completely seal welded with a minimum 3/16-inch fillet weld. Intermittent welding shall not be allowed.
1. Edge Grinding: Sharp projections of cut or sheared edges of metals shall be ground to a radius by multiple passes of a power grinder as required.
  2. Structural Design: The ratio of unbraced length to least radius of gyration (slenderness ratio) shall not exceed the values listed in the AISC manual. In addition, all structural members and connections shall be designed so that the unit stresses will not exceed AISC allowable stressed by more than one-third when subject to extreme live load conditions of wind, ice, seismic, and operation loads. All steel design shall be in accordance with the AISC Manual of Steel Construction, latest edition, and the Uniform Building Code (UBC), latest edition.

2.2 CENTER ASSEMBLY

- A. The center assembly shall be the top bearing support type and shall consist of a stationary base and center mast, a rotating center barrel with support cage, thrust bearing, stabilizing bearing, barrel seal and lubrication fittings. The center assembly shall be shop assembled, adjusted, aligned and shipped as a complete unit.
- B. Base and Center Mast: The stationary base shall be of fabricated galvanized steel and arranged for bolting to the concrete center pier. The center of the base shall be open to allow for influent flow into the center barrel. A pipe center mast designed to withstand any overturning moments shall extend vertically from the base to the top of the distributor where

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TRICKLING FILTER

it shall support the thrust bearing assembly. The base shall be grouted in place only after complete assembly and leveling of the distributor.

- C. Center Barrel and Support Cage: The rotating center barrel shall be a minimum of 1/4-inch fabricated aluminum of sufficient strength and size to handle the specified flows. The center barrel shall include an annular baffle with an adjustable weir to divide the flow between the primary and secondary arms. Opening shall be provided with flanged connections for attachment of distribution arms. The center barrel shall be designed to properly distribute the flow to the arm eliminating eccentric loads as the distributor starts or stops. A support cage shall be furnished, fabricated of structural members arranged as a supporting frame between the center barrel and the thrust bearing assembly. The cage shall be equipped with top connections for tie rod arm supports.
- D. Upper Bearing: The upper bearing shall be located above the influent at the top of the stationary center mast. The bearing shall be an oil lubricated, precision 4-point contact bearing. Designed for an ABMA L10 life of over 30 years at full hydraulic load. The bearing housing shall include a filler pipe, oil level plug, and an oil drain plug.
- E. Barrel Seal: A seal shall be provided between the stationary base and the rotating barrel. It shall be a mechanical seal and shall be designed to withstand the full hydraulic head in the center barrel. It shall consist of a weighted replaceable annular ring of Buna-N attached to the stationary base, with the outer portion resting on a replaceable seal plate.

2.3 DISTRIBUTION ARMS

- A. Distribution Arms: Distribution arms shall have a rectangular tapered cross section of fabricated aluminum. Each arm shall be provided with openings to accept spreader assemblies. The spreader assemblies shall consist of an interchangeable orifice and a spreader.
- B. Interchangeable orifices: Orifices shall be sized and located to provide uniform flow distribution over the entire area of the filter bed. Orifices will be interchangeable at the spreader and shall have a minimum opening of 1-inch diameter to minimize plugging.
- C. Spreaders: Spreaders shall be of high-strength polycarbonate construction and shall be located to provide uniform flow distribution over the entire area of the filter bed. Assemblies that use two bolts or more to connect to the arms shall not be acceptable.
- D. A large 2-inch vent and a quick opening flushing gate shall be provided for each distribution arm.
- E. The arms shall be vertically supported from the top of the support cage by 304 stainless steel tie rods, turnbuckles and end attachments, and they shall be laterally braced by horizontal stainless-steel stranded cable with adjustable end attachments.

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2.4 ANCHORAGE AND FASTENERS

- A. Anchor Bolts: All anchor bolts shall be existing. Supplier shall supply hex nuts and flat washers.
- B. Fasteners: All structural fasteners shall be a minimum of 1/2-inch diameter and made of type 304 stainless-steel. The equipment supplier shall furnish all fasteners required for the assembly of the equipment.

2.5 SPARE PARTS

- A. One (1) Wedge tight, quick opening flush gate
- B. Ten (10) Adjustable orifice plates
- C. Ten (10) Flow spreaders nozzles
- D. One (1) Distribution arm gasket
- E. One (1) complete set of seals & gaskets

PART 3 - EXECUTION

3.1 GENERAL

- A. The equipment shall be installed properly to provide a complete working system. Installation shall follow the manufacturer's recommendations.
- B. The existing dome, ventilation shall be removed and reinstalled by the Contractor after the installation of the new equipment.
- C. Only one trickling filter may be out of service at any time.

3.2 MANUALS

- A. The equipment supplier shall furnish three copies of operation and maintenance manuals, which will be retained at the installation site to assist plant operators. The manual shall include the supplier's erection and assembly recommendations, a complete parts list, and a list of recommended spare parts.

3.3 SHOP ASSEMBLY AND INSPECTION

- A. The equipment specified herein shall be factory assembled as far as practical to verify that all mating parts can be field assembled. All mating parts shall be trial fit and match marked. The manufacturer shall submit certification of shop trial assembly and photographs of assembly

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TRICKLING FILTER

before shipment. The customer and installing contractor shall be given the opportunity to witness the shop assembly.

- B. Shop inspection shall be performed by a qualified inspector and certified by the manufacturer. The inspection shall be documented, and all deficiencies noted, corrected, re-inspected and final completion formally authorized. Final shipment authorization shall be by the manufacturer to ensure completion of all fabrication, assembly, and inspection requirements. Inspection records and evidence of inspector qualification shall be submitted to the owner upon request.

3.4 FIELD SERVICE

- A. The equipment supplier shall provide the service of a qualified representative for two trips and two days to inspect the mechanism installation, assist in start-up, and instruct plant personnel in the proper operation and maintenance of the mechanism.

3.5 FIELD TESTING

- A. Operational Test: After installation and inspection, flow shall be introduced to the distributor, and it shall be carefully observed. Any excessive tipping, binding, jerking, or unusual motion shall be noted, and corrective action taken. Once the flow is resumed, a pan test shall be performed at both minimum and maximum flows to ensure that flow is uniformly distributed over the entire media. If, after several attempts, the unit does not successfully pass the operational and pan test, the faulty portion of the equipment shall be replaced, and the test rerun.

END OF SECTION