

Department of Public Works

515 North Avenue

New Rochelle, NY 10801

(914) 654-2131



Wilfredo Melendez, P.E.
Commissioner

City of New Rochelle, New York
DEPARTMENT OF PUBLIC WORKS

CONTRACT DOCUMENTS

FOR

40 PELHAM RD INTERIOR RENOVATIONS
DPW PROJECT No. 23-012
SPEC # 5629

October 11, 2023

TABLE OF CONTENTS

	PAGES
INVITATION TO BIDDERS	2
“SCHEDULE A” TO THE GENERAL AGREEMENT	3
INSURANCE REQUIREMENTS	5
 SECTION A – INSTRUCTIONS TO BIDDERS	 A1 - A18
1. PROCEDURES OF SUBMITTING A BID	A1 - A3
A. CONTENTS	A1
B. EXAMINATION OF PLANS, SPECIFICATIONS, ADDENDA, ETC	A1
C. BIDDING TIME AND FORM	A1
D. BID TO COVER EVERY ITEM	A1
E. BIDDING FORM NOT TO BE TAKEN APART	A1
F. CERTIFIED CHECK, CASHIER’S CHECK, BID BOND or CASH	A2
G. APPROXIMATE ESTIMATES of QUANTITIES	A2
H. CONSTRUCTION CONDITIONS	A3
I. TIME FOR COMPLETION	A3
J. REJECTION OF BIDS	A3
 2. CONDITIONS TO BE MET BY SUCCESSFUL BIDDER	 A4 - A17
A. COMPLIANCE WITH CONTRACT PROVISIONS	A4
B. COMPLIANCE WITH LABOR and OTHER LAWS	A4
C. INSURANCE REQUIRED	A4
D. BOND REQUIRED	A4
E. BIDDER TO BE COMPETENT	A5
F. AWARD OF CONTRACT	A5
G. NOTIFICATION to CONTRACTOR - EEO	A5
H. NONDISCRIMINATION AND EEO POLICY STATEMENT	A6 – A8
I. NYS AFFIRMATIVE ACTION REQUIREMENTS	A9 – A17
 SECTION B – BIDDER’S PROPOSAL	 B1 – B11
CONTRACTOR’S QUALIFICATIONS STATEMENT	B3 – B6
STATEMENT OF NON-COLLUSION	B7
RESOLUTION	B8
NEW YORK STATE AFFIRMATIVE ACTION CERTIFICATE	B9
BID SCHEDULE OF PRICES	B10 – B11
 SECTION C – GENERAL AGREEMENT	 C1 – C23
1. GENERAL	C1 – C8
2. CONDUCT AND INSPECTION OF WORK	C8 - C12
3. COMPLIANCE WITH LAWS AND REGULATIONS	C12 - C15
4. PAYMENT FOR WORK	C15 – C23
 SECTION D – EXECUTION OF CONTRACT	 D1 – D4
 SECTION E – FORM OF BONDS	 E1 –E5
 SECTION F - PREVAILING WAGE RATES	 F1
 TECHNICAL SPECS – RESTROOMS, LOCKER ROOM, LOUNGE, AND OFFICE RENOVATIONS	
 TECHNICAL SPECS – HVAC AND BATHROOM EXHAUST	
 DRAWINGS – RESTROOMS, LOCKER ROOM, LOUNGE, AND OFFICE RENOVATIONS	
 DRAWINGS – HVAC AND BATHROOM EXHAUST	

INVITATION TO BIDDERS
CITY OF NEW ROCHELLE, NEW YORK
DEPARTMENT OF PUBLIC WORKS

40 PELHAM RD INTERIOR RENOVATIONS
PROJECT No. 23-012

1. Sealed bids will be received by the Purchasing Department no later than **Wednesday November 1st, 2023 at 3:00 PM**. All vendors are encouraged to submit sealed bids via mail to the mailing address shown below:

Purchasing Department
515 North Avenue
New Rochelle, NY 10801

Bid envelopes shall be plainly marked SPEC # 5629

Bids will be publicly opened at the Ground Floor Purchasing Office at **3:00 pm on Wednesday, November 1st, 2023**.

2. Each bid must be accompanied by a DEPOSIT in the form of bid bond, certified check or cashier's check, made payable to the CITY OF NEW ROCHELLE, NEW YORK, in the amount of five percent (5%) of the bid price (**CASH WILL NOT BE ACCEPTED**). The City reserves the right to reject any or all bids.
3. Copies of Contract Documents are available for direct download from the City's website at <http://www.newrochelleny.com/bids.aspx> under Bid Opportunities beginning at **3:00pm on Wednesday, October 11th 2023**. No fee is associated when obtaining copies of Contract Documents. Addendums and responses to questions are posted to the City's website as well. It shall be the bidders' responsibility to check for Addendums.
4. Firms qualified and certified as Minority Business Enterprises (MBE) and Women Business Enterprises (WBE) are strongly encouraged to submit a bid.
5. The City of New Rochelle is a supporter of the Westchester Affirmative Action Equal Employment Opportunity requirements and agreements. In compliance with Section 3, the City of New Rochelle encourages employment first of New Rochelle residents.
6. Please note that the Contractor shall pay the higher wage rates of either the prevailing New York State Wage Rates or Davis Bacon.
7. A pre-bid field meeting will be held at 40 Pelham Rd, New Rochelle, NY 10801 on **Tuesday, October 17th, 2023 at 10:00 am**. Bidders are highly encouraged to attend this meeting to familiarize with site conditions.
8. Any questions must be submitted via email to Karin Conca at kconca@newrochelleny.com (include Project No. 23-012 and the spec # 5629 in the subject line). All questions must be turned in by **Tuesday, October 17th, 2023 at 3:00 pm**. Answers to questions will be posted by Wednesday, October 25th, 2023 at 3:00pm on the City's website.
9. General Conditions – Referenced in Contract Bid Documents:

See Schedule "A", attached.
10. Insurance Requirements & Endorsements – Referenced in Contract Bid Documents Section C:

See Schedule "A", attached.

SCHEDULE "A" TO THE GENERAL AGREEMENT

DPW Project No. 23-012

Project Name: 40 Pelham Interior Renovations

<u>Reference</u>	<u>Item</u>	<u>Requirement</u>
Information for Bidders	Bid Security	5% Bid Amount
Information for Bidders	Performance Security	100% of Contract Amount
Agreement (Article 8)	Time for Completion	Total Consecutive Calendar Days (excl. holidays): 150
Agreement (Article 8)	Liquidated Damages	For Each Consecutive Calendar Day Over Completion Time \$ (500)
Agreement (Article 14)	Subcontracts	Not to Exceed 49% of the Contract
Agreement (Article 22)	Insurance	See below and attached
Agreement (Article 21)	Maintenance	2% of the Contract Amount

** Certificates of Insurance to be provided upon award

Where indicated by an (x), insurance in the amounts specified below are required under this Contract.

(x)	New York State Disability	Statutory
(x)	Worker's Compensation	Statutory
(x)	Employer's Liability	\$1,000,000 each accident

- (x) **Commercial General Liability** – Per Occurrence Limit - Bodily Injury, Personal and Advertising Injury, and Property Damage, including Contractual Liability (to be stated on the certificate of insurance)

\$2,000,000	Per Occurrence
\$1,000,000	Products/Completed Operations Aggregate
\$2,000,000	General Aggregate
\$25,000	Maximum Deductible

-
- (x) **Automobile Liability** - Combined Single Limit - Bodily Injury and Property Damage

\$1,000,000	Per Person Each Occurrence for Bodily Injury
\$100,000	Per Occurrence for Property Damage

The following coverage must be provided (to be stated on the certificate of insurance):

(x) Comprehensive (x) Owned (x) Hired (x) Non-Owned

In addition, if indicated by an (x), the following insurance must be provided and/or hazards must be covered:

()	Excess Insurance	_____
()	Other	_____

-
- (x) Additional Named Insured:

City of New Rochelle, its officials, employees and agents

()	Other	_____
-----	-------	-------

INSURANCE REQUIREMENTS

A. General Requirements

1. Prior to the commencement of Work, the Contractor shall procure and maintain, at its own cost and expense, the types and amounts of insurance indicated in Schedule A of the General Agreement. Such insurance shall be maintained through the date of completion of all required Work. The City reserves the right to increase or decrease the required insurance during the Contract.
2. All insurance required by the Contract shall be obtained at the sole cost and expense of the Contractor; shall be maintained by insurance carriers licensed and admitted to do business in New York State and acceptable to the City; shall be primary and non-contributory to any insurance or self-insurance available to the City; and shall be endorsed to provide written notice be given to the City at least thirty (30) days prior to the cancellation, non-renewal, or material alteration of such policies.
3. The Contractor shall be solely responsible for the payment of all premiums, deductibles and self-insured retentions to which such policies are subject. Deductibles and self-insured retentions must be approved by the City. Such approval shall not be unreasonably withheld. The City reserves the right to withhold portion of payment until the deductible is satisfied.
4. All required insurance policies shall be maintained with companies that have an A.M. Best rating of an A/VII, unless prior written approval is obtained from the City's Corporation Counsel. If, during the term of the policy an insurer's rating falls below A/VII, the insurance must be replaced no later than the renewal date of the policy with an insurer acceptable to the City.
5. The Contractor shall not take any action or omit to take any action that would suspend or invalidate any of the required coverages during the period of time such coverages are required to be in effect.
6. Not less than thirty (30) days prior to the expiration date or renewal date, the Contractor shall supply the City updated replacement certificates of insurance and amendatory endorsements.
8. All insurance policies must be open to inspection and copying by the City upon written request.

B. Workers' Compensation, Employers' Liability, and Disability Benefits Insurance

1. The Contractor shall provide, and shall cause its Subcontractors to provide, Workers' Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance in accordance with the Laws of the State of New York on behalf of all employees providing services under the Contract. Pursuant to General Municipal Law Section 108, this Contract shall be void and of no effect unless the Contractor maintains Workers' Compensation Insurance for the term of this Contract to the extent required and in compliance with the New York State Workers' Compensation Law.
2. For Workers' Compensation Insurance, the Contractor shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers'

Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the Commissioner and the City Corporation Counsel. For Disability Benefits Insurance, Contractor shall submit DB-120.1 - Certificate of Insurance Coverage Under the NYS Disability Benefits Law; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the Commissioner and City Corporation Counsel. ACORD forms are not acceptable.

4. The Contractor shall procure Employer's Liability Insurance affording compensation for all employees providing labor or services for whom Workers' Compensation coverage is not a statutory requirement.

C. Commercial General Liability Insurance

1. The Contractor shall provide Commercial General Liability Insurance ("CGL"), written on a per occurrence form and subject to limits specified in Schedule A, covering claims for bodily injury (including death), personal and advertising injury, and property damage, which may arise from any of the operations under this Contract. Coverage under this insurance shall be written on the latest edition of Insurance Services Office ("ISO") Form CG 00 01 or a substitute form providing equivalent coverage and shall cover liability including Premises Operations; Independent Contractors and Subcontractors; Products and Completed Operations; Broad Form Property Damages; Contractual Liability (including the tort liability of another assumed in a contract); and Explosion, Collapse and Underground (XCU).

2. Policies shall name the Contractor as Named Insured and the City of New Rochelle, its officials, employees and agents (and all other entities designated as additional insureds in Schedule A) as Additional Insureds for claims arising from the Contractor's operations under the Contract, with coverage at least as broad as the latest edition of ISO Form CG 20 26 or its equivalent.

3. Products and Completed Operations Coverage shall include a provision that coverage will extend for a period of at least twelve (12) months from the date of final completion and acceptance by the City of all Contractor Work and provide coverage at least as broad as the latest edition of ISO Form CG 20 37 or its equivalent.

D. Commercial Automobile Liability Insurance. The Contractor shall provide Commercial Automobile Liability Insurance for liability arising out of the ownership, maintenance or use of any owned, non-owned and hired vehicles to be used in connection with this Contract, on which the City of New Rochelle, its officials, employees and agents (and all other entities designated as an additional insured in Schedule A) shall be named as an Additional Insured. Coverage shall be at least as broad as the latest edition of ISO Form CA 00 01. If vehicles are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) and proof of MCS 90.

E. Construction Insurance

1. Builder's Risk Insurance. If specified in Schedule A of the General Agreement, the Contractor shall provide Builders Risk Insurance on a completed value form for the total value of the Work through

completion of the Work. Such insurance shall be provided on an All Risk basis and include, without limitation, coverage for windstorm (including named windstorm), storm surge, flood and earth movement. Unless waived by Corporation Counsel, it shall include coverage for ordinance and law, demolition and increased costs of construction, debris removal, pollutant clean up and removal, and expediting costs. Such insurance shall cover, without limitation, (a) all buildings and/or structures involved in the Work, as well as temporary structures at the Site, and (b) any property that is intended to become a permanent part of such building or structure, whether such property is on the Site, in transit or in temporary storage. Policies shall name the Contractor as Named Insured and the City as both an Additional Insured and a Loss Payee as its interest may appear. Such policies shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company. Such insurance may be provided through an Installation Floater, at the Contractor's option, if it otherwise conforms with the requirements herein.

2. Contractors Pollution Liability Insurance. If specified in Schedule A of the General Agreement, the Contractor shall maintain, and cause its Subcontractors doing such Work to maintain, Contractors Pollution Liability Insurance covering any environmental claims, liabilities, loss or damage, including property damage, bodily injury, disease, transporter liability and properties contaminated during transportation caused by pollution conditions that arise from the operations of the Contractor and its Subcontractors of every tier. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos), or in the investigation, settlement or defense of any claim, action, or proceedings arising from the operations under the Contract. Such insurance shall be in the Contractor's name and name the City of New Rochelle, its officials, employees and agents (and all other entities designated as an additional insured in Schedule A) as an Additional Insured. Additional Insured coverage shall be at least as broad as provided to the Contractor for this Project. If such insurance is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this Contract, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three (3) years from the time the Work under this Contract is completed.

F. Other Provisions

1. The Contractor shall file with the Resident Engineer, certificates of insurance and endorsements evidencing compliance with all of the insurance requirements contained in Schedule A to the satisfaction of the City. The Contractor shall not commence the Work unless and until all required proofs of insurance have been submitted to and accepted by the City. Acceptance and/or approval by the City does not relieve the Contractor of any obligations, responsibilities or liabilities under the Contract.

2. The Contractor shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by the Contract and shall be authorized to perform Work only during the effective period of all required coverage. In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the Contractor shall immediately stop all Work, and shall not recommence Work until authorized in writing to do so by the Commissioner.

3. The Contractor shall notify in writing all insurance carriers that issued potentially responsive policies of

any loss, damage, occurrence, accident, claim or suit relating to any operations under the Contract (including notice to CGL carriers for events relating to the Contractor's own employees) no later than twenty (20) days after such event. For any policy where the City is an Additional Insured, such notice shall expressly state that "this notice is being given on behalf of the City of New Rochelle as an Additional Insured as well as the Named Insured." The Contractor shall simultaneously send a copy of such notice to the City's Corporation Counsel. The Contractor shall at all times fully cooperate with the City with regard to such potential or actual claims or suits.

4. The Contractor shall require any Subcontractor, with regard to any operations under this Contract, to procure insurance in accordance with the requirements herein and to name the City of New Rochelle, its officials, employees and agents as an Additional Insured thereunder, with coverage at least as broad as ISO Form 20 26.

5. The Contractor waives all rights against the City, including its officials and employees, for any damages or losses that are covered under any insurance required hereunder (whether or not such insurance is actually procured or claims are paid thereunder) or any other insurance applicable to the operations of the Contractor and/or its employees, agents, or Subcontractors.

6. In the event the Contractor utilizes a self-insurance program to satisfy any of the insurance requirements hereunder, the Contractor shall ensure that any such self-insurance program provides the City with all rights that would be provided by traditional insurance, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

7. The Contractor's failure to secure policies in complete conformity with the foregoing, or to give an insurance company timely notice as required in the Contract, or to do anything else required hereunder, shall constitute a material breach of the Contract. Such breach shall not be waived or otherwise excused by any action or inaction by the City at any time. Insurance coverage provided pursuant to these requirements or otherwise shall not relieve the Contractor of any liability under the Contract, nor shall it preclude the City from exercising any rights or taking such other actions available to it under any other provisions of this Contract or Law.

8. Insurers shall have no right of recovery or subrogation against the City, it being the intention of the parties that the insurance policies so effected shall protect both parties and shall be primary coverage for any and all losses covered by the insurance described above.

9. The Contractor may satisfy its insurance obligations through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein and "drop down" for exhausted aggregate limits under the liability coverages referenced above.

10. The City, may at its discretion, and if approved by the City's Corporation Counsel, accept letters of credit or custodial accounts in lieu of bonds and insurance requirements.

SECTION A

INSTRUCTIONS TO BIDDERS

I. PROCEDURES OF SUBMITTING BID

A. CONTENTS

Attention of bidders is called to the contents of the Invitation to Bidders, and Scope of Work a copy of which is annexed hereto and made part here-of. All the work in the Contract is described in detail in the Plans and Specifications and Addenda, if any, Information for Bidders, Bidder's Proposal and Contract Documents, all of which are attached hereto and made a part thereof.

B. EXAMINATION OF PLANS, SPECIFICATIONS, ADDENDA (if any) AND LOCATION

Contractors are particularly requested to examine the plans and specifications and location of the work before bidding.

C. BIDDING TIME AND FORM

Sealed proposals will be received by the Purchasing Department of the City of New Rochelle, New York, at the time, date and place stated in the Notice to Bidders, for the work herein mentioned, at which time and place they will be publicly opened and read aloud.

The award of the Contract, if awarded, will be made by the Commissioner of Public Work as soon thereafter as practicable.

The Commissioner of Public Work reserves the right to waive minor informalities in any bid, but conditional bids will not be accepted.

Bids must be submitted in a sealed envelope, endorsed with the title of the work, the name of the person or persons making the same and the date of presentation, and containing also the Bid Deposit as prescribed hereafter.

D. BID TO COVER EVERY ITEM

All bids must be made upon the blank form of proposal attached hereto both in writing and in figures, and must be signed by the bidder. In case of any discrepancies, the written prices shall be considered the price bid.

These prices are to cover the furnishing of all the necessary materials and labor; and the performance of all the work as set forth in the specifications and form of agreement hereto annexed.

(REVISED 11/2020)

E. CERTIFIED CHECK, CASHIER'S CHECK, CREDIT CARD or BID BOND

No bid will be received and deposited unless accompanied by a certified check, cashier's check, credit card or bid bond. **Certified or Cashier's check shall be made payable to the order of the City of New Rochelle**, for the amount stated in the Notice to Bidders. Bid Bonds must be issued by an approved bonding or insurance company, authorized to do business within the State of New York. Such security shall be an amount of not less than five (5%) per cent of the proposal submitted.

All bid deposits, whether check, credit card, or bond, shall be held by the City of New Rochelle, New York, as security that the person or persons to whom the contract shall be awarded will enter into a contract therefore and give security required for the performance thereof within ten (10) business days after notice of such award. Such bid deposit must be enclosed in the sealed envelope containing the bid.

All such deposits, except those of the two low bidders, fifty percent (50 %) will be returned to the person or persons making the bids within three (3) business days after the opening of the bids, while the remaining deposit will be returned at fifty percent (50%) as soon as the contract has been properly executed by the bidder to whom the contract shall have been awarded. The second low bidder's security deposit shall be kept by the Owner until such a time it is fairly obvious that the awarded contract(s) has (have) a fair chance of completion. In case the low bidder forfeits the contract, the second low bidder shall be awarded the contract.

If the bidder to whom the contract has been awarded shall refuse or neglect to execute and deliver the same and furnish the security required within ten (10) business days after due notice that the contract has been awarded , the amount of the deposit made shall be retained by the said City as liquidated damages for such neglect or refusal, and shall be paid into the General Fund of the said City, but if the said bidder to whom the contract is awarded shall execute and deliver the contract and furnish the said security within the time specified the amount of the deposit will be returned.

The bidder by submission of a bid agrees with the City that the amount of the said deposit represents the amount of the damages the City will suffer by reason of any default as aforesaid.

F. APPROXIMATE ESTIMATE OF QUANTITIES

In the Bidder's Proposal there is a statement of quantities based upon the estimate of the Engineer of the quantities of the various classes of work and the nature and extent, as near as practicable, of the work required. The several bids will be computed, tested and canvassed by the total cost of all the items in this approximate estimate at the prices bid.

The quantities are approximate **only**, being given as a basis for the uniform comparison of bids, and the Commissioner does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the quantities and amounts of any or all items of the work at prices bid, as may be deemed necessary by the Engineer.

Bidders are required to submit their estimates upon the following express conditions which shall apply to and become a part of every bid received, to wit:

Bidders must satisfy themselves, by a personal examination of the location of the proposed work and/or by such other means as they may prefer, as to the actual conditions and requirements of the work and the accuracy of the foregoing estimate of the Engineer and shall not at any time after submission of a bid assert or claim that there was any misunderstanding in regard to the nature of the work or the conditions affecting the work.

Attention is called to the uncertainty as to the actual total quantity of materials to be excavated, especially as to the quantities and kinds of material, since that will depend upon the character of the earth and rock which cannot be determined in advance.

An increase or decrease in the quantity for any item shall not be regarded as sufficient ground for an increase or decrease in the prices nor in the time allowed for the completion of the contract, except as provided in the contract.

G. CONSTRUCTION CONDITIONS

Bidders are required to inform themselves fully of the conditions relating to construction and labor under which the work will be or is now being performed and the contractor must employ, so far as practicable, such methods and means in the carrying out of the work as will not cause any interruption or interference with any other contractor(s).

H. TIME FOR COMPLETION

All work included hereunder shall be fully completed within the time stated in the Scope of the Work. This time will be measured in Calendar Days from the date designated by the Commissioner of Public Works in the Notice to the Contractor, ordering the Contract work to be commenced. Failure to complete the work of the Contract within the time specified will be just cause for the retention from any monies due or to become due under the contract, of any damage suffered by the City by reason of such failure to complete the contract. Any delay in the completion of the Contract, caused solely by the City, will be added to the above time allowance for completion. In case of undue or extreme delay caused by the City, funds retained by the City from previous progress payments in accordance with the Contract provisions may be released to the Contractor, if, in the opinion of the Commissioner, the withholding of such retained funds works a hardship on the Contractor. Such release will not, however, relieve the Contractor of any and all obligations under the Contract, which shall remain in full force and effect.

I. REJECTION OF BIDS

The Commissioner reserves the right to select the bid or proposal, the acceptance of which will, in his/her judgment, best secure the efficient performance of the work, or to reject any or all bids. Proposals which are incomplete, conditional, or obscure or which contain additions not called for, erasures, alterations, ambiguities, or irregularities of any kind, may be rejected as informal. Permission will not be given for the withdrawal of any bid or estimate, and the right is expressly reserved by the Commissioner of Public Works to reject all estimates should he/she deem it to the public interests to do so. No estimates will be accepted from or the Contract awarded to any person who is in arrears to the City upon debt or contract, or who is in default, as principal or surety or otherwise, upon any Obligation to the City.

II. CONDITIONS TO BE MET BY SUCCESSFUL BIDDER

A. COMPLIANCE WITH CONTRACT PROVISIONS

The successful bidder will be required to comply with the provisions set forth in the Contract in regard to preference in employment and discrimination in employment, hours of work, wage rates and payment of wages, and with all other provisions of the Contract, which Contract is attached hereto, and made a part hereof.

B. COMPLIANCE WITH LABOR AND OTHER LAWS

The successful bidder will be required to agree that bidder will comply with all the applicable provisions of the Labor Law, the Public Health Law, the Lien Law, the Workmen's Compensation Law, the State Unemployment Insurance Law, the Federal Social Security Law, any and all rules and regulations promulgated by the Department of Labor and/or the Industrial Commissioner of the State of New York, any applicable Federal Law, rule or regulation, the Charter of the City of New Rochelle, any Local Laws, ordinances, resolutions, or regulations of the City of New Rochelle, and all amendments and additions thereto.

By submission of the 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 201-g of the labor law.

C. INSURANCE REQUIRED

The attention of bidders is called to the fact that the Contractor will be required to take out, and continue in effect during the life of the Contract, insurance in accordance with the provisions set forth in the Contract, and in the quantities specified therein. Proof of insurance documents must be provided to the City of New Rochelle as stated in the Contract.

D. BOND REQUIRED

For the performance of the Contract a bond will be required which shall be in the penalty of one hundred percent (100%) of the Contract price, shall be in the annexed approved form, shall be signed by the party to whom the work is awarded and by a solvent fidelity or surety company authorized by the laws of this State to transact such business and must meet with the approval of the Corporation Counsel of the City of New Rochelle, as to form and correctness. Said Surety Company must be approved by the Corporation Counsel.

The bidder whose bid shall be accepted will be required to attend at the office of the Commissioner of Public Works in person or, if a corporation, shall be represented by a duly authorized representative, with the surety offered by him/her and shall be prepared to execute the Contract and bond within ten (10) business days after a written notice from the Commissioner of Public Works that the Contract has been awarded to him/her. In case of failure or neglect to do so may, at the option of the Commissioner, be deemed to have abandoned the Contract as in default to the City under the provisions above set forth.

If at any time after the execution and approval of this Contract and the bonds required by the Contract documents, the City of New Rochelle shall deem any of these sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds shall cease to be

adequate security for the City of New Rochelle, the Contractor shall, within ten (10) business days after Notice of the City of New Rochelle by the Commissioner of Public Works do so, furnish new or additional bonds, in form, sum and signed by such sureties as shall be satisfactory to the City of New Rochelle. No further payment shall be deemed due nor shall any further payment be made to the Contractor unless and until such new or additional bonds shall be furnished and approved. Premiums on such bonds will be paid for by the Contractor

E. BIDDER TO BE COMPETENT

Before the award of the Contract, the bidder to whom it is proposed to award same will be required to show to the satisfaction of the Purchasing Dept that the bidder has the necessary facilities, experience, ability, and financial resources to perform the work in a satisfactory manner and within the time stipulated, and that has had experience in construction works of the same or of a similar nature.

F. AWARD OF CONTRACT

The City will award the Contract based upon the base bid price and consideration of ADD Alternate Bids. The City will award alternate bids in the numerical order presented. The award of contract will be based upon the base bid amount plus the alternate or alternates selected by the City.

G. NOTIFICATION TO CONTRACTOR

EQUAL EMPLOYMENT OPPORTUNITY

The Contractor is herein made aware that the City of New Rochelle, New York, requires adherence to the Westchester County Affirmative Action and Equal Opportunity agreements and requirements applicable to public works contracts. It shall be the Contractor's responsibility to become familiar with said requirements, and to comply with any and all regulations stated therein and in the Westchester County Plan (defined below).

ADDITIONAL PROVISIONS

The contractor shall also maintain compliance with the following:

- 1) COPELAND "ANTI-KICKBACK" ACT - (18 U.S.C. 874) as supplemented in Department of labor Regulation (29 CFR Part 3).
- 2) DAVIS-BACON ACT - (40 U.S.C. 276a to a-7) as supplemented in Department of Labor Regulation (29-CFR Part 5).
- 3) CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - (40 U.S.C. 327-330) SECTIONS 103 & 107 AS SUPPLIMENTED BY Department of Labor Regulation (29 CFR Part 5).
- 4) PREVAILING WAGE RATES - as supplied by New York State Department of Labor.

NOTE: IF THE ABOVE DOCUMENTS ARE NOT INCLUDED IN THIS SECTION, COPIES OF THE ABOVE MENTIONED REGULATIONS ARE ON FILE IN THE ENGINEERING OFFICE, CITY HALL, 515 NORTH AVENUE, NEW ROCHELLE, NEW YORK, FOR YOUR INFORMATION. SAID REGULATIONS SHALL BE INCLUDED IN THE FINAL CONTRACT PACKAGE.

H. ECONOMIC OPPORTUNITY AND NON-DISCRIMINATION POLICY FOR THE CITY OF NEW ROCHELLE

The City of New Rochelle finds and determines that contracts awarded by the City, and economic development projects supported by the City or benefiting from zoning enhancements, provide a crucial opportunity for advancing City policy objectives, including targeting employment and business opportunities. In addition, prohibiting barriers to employment and invidious discrimination in City-supported contracts and projects is an important goal of the City in its expenditures and economic development activities.

Pursuant to Chapter 31 of the New Rochelle City Code, the successful bidder will be obligated to adhere to the City established Economic Opportunity and Nondiscrimination Policy applicable to City-awarded contracts and specified economic development projects, as follows:

1. Employment and training opportunities

- a. Construction Employment. Each Construction Contractor shall take the following steps in the following order, in an effort to employ Targeted Workers to perform at least 20% of the work hours on the project or contract.
 - (i) Step One: Utilize the Construction Contractor's discretion to assign to perform project work to any current employees who are Targeted Workers;
 - (ii) Step Two: If the Construction Contractor utilizes a union hiring hall to retain workers, utilize name call, rehire, similar procedures in the relevant collective bargaining agreement, and an explicit request, to retain Targeted Workers;
 - (iii) Step Three: If the above steps have not enabled employment of Targeted Workers to perform at least 20% of the work hours on the project or contract, request referral of Targeted Workers from the City's First Source Center; and
 - (iv) Step Four: Reasonably consider workers that have been referred by the First Source Center within five business days of request therefor.

If the Construction Contractor has not filled available jobs with Targeted Workers through the steps set forth above, it may recruit and hire workers through any mechanism, and shall continue to reasonably consider workers that have been referred by the First Source Center for up to 15 days after initial notification. Employers that need to hire on an emergency basis in order to maintain operations may hire from any source immediately, but still shall notify the First Source Center about available positions, and reasonably consider any candidates referred before hiring is complete.

New apprentice employment requirements for Prime Contractors. For each 20,000 construction work hours performed by a Prime Contractor and its subcontractors of any tier, such Prime Contractor and its subcontractors of any tier shall act as a Subscribing Employer for at least one individual newly enrolled as an apprentice in an apprenticeship program registered with the New York State Department of Labor, and employ such new apprentice for an aggregate total of at least 1,000 hours of work on the prime contract or subcontracts.

- b. Non-construction employment. Each Employer shall undertake the following steps in the following order, in an effort to hire Targeted Workers to fill at least 25% of available jobs on the project or contract.

- (i) **Step One: Notification of job opportunities.** When an Employer has an opening for an on-site job available, the Employer shall notify the First Source Center of the job opening and provide a description of job responsibilities and qualifications. Job qualifications shall be limited to qualifications directly related to performance of job duties.
 - (ii) **Step Two: Consideration of Targeted Workers.** The Employer shall then use standard hiring practices, including interviews, to consider all Targeted Workers referred by the First Source Center and meeting the qualifications described in the referral request during a five-day period after initial notification, or until all open on-site jobs are filled, whichever is sooner. The Employer shall make good-faith efforts to fill all available on-site jobs with Targeted Workers. If at the conclusion of the five-day period the Employer has been unable to fill all openings for on-site jobs with Targeted Workers, the Employer may use other recruitment methods. Employers that need to hire on an emergency basis in order to maintain operations may hire from any source immediately, but still shall notify the First Source Center about available positions, and reasonably consider any candidates referred before hiring is complete.
- c. Hiring discretion. Nothing in this policy requires that any Construction Contractor or Employer hire any particular individual. Each Construction Contractor shall have the sole discretion to judge the qualification of and to hire or decline to hire any individual referred by the First Source Center or any other source. In order to improve the first source system and the City's job training pipeline, each Employer that declines to hire a first source referral for an available position shall provide to the First Source Center a written account of reasons for rejecting such candidates.

2. Business Opportunities

a. Construction contracts

- (i) **Prime contracting.** The City and each Developer shall have a goal of awarding at least 10% of prime contracts for construction work, including trucking services, to businesses based in the City. The City and the Developer shall make affirmative efforts to provide outreach to M/WBEs, including notification of bidding opportunities to a list of sources provided by the City, responsive communications with M/WBEs that express interest in bidding, and full and fair considerations of bids submitted by M/WBEs.
- (ii) **Subcontracting.** Each Prime Contractor shall have a goal of awarding at least 20% of the dollar value of subcontracts for construction work, including trucking services, to businesses based in the City. Each Prime Contractor shall make affirmative efforts to provide outreach to M/WBEs, including notification of bidding opportunities to a list of sources provided by the City, responsive communications with M/WBEs that express interest in bidding, and full and fair considerations of bids submitted by M/WBEs.
- (iii) **Contracts and subcontracts for construction** shall include the requirement to submit quarterly utilization reports in a form provided by the City indicating the number and percentage of Targeted Workers and M/WBEs employed at a job site, with certified payroll sheets listing employees' biweekly payroll.

b. Service contracts

- (i) The City, each Developer, Employers, and management entities operating portions of Public-Private Projects shall have a goal of awarding at least 20% of the dollar value of service contracts (not including construction contracts) to be performed on-site at the project to businesses based in the City. Entities awarding service contracts shall

make affirmative efforts to provide outreach to M/WBEs, including notification of bidding opportunities to a list of sources provided by the City, responsive communications with M/WBEs that express interest in bidding, and full and fair considerations of bids submitted by M/WBEs.

- (ii) Service contracts shall include the requirement to submit quarterly utilization reports in a form provided by the City indicating the number and percentage of Targeted Workers and M/WBEs employed on Public-Private Projects, with certified payroll sheets listing employees' biweekly payroll.

3. Implementation

- a. This Policy applies to and shall be incorporated into all City Contracts and into contracts between the City and Developers related to Public-Private Projects. When parties referenced in this Policy engage subcontractors, tenants, and other parties to operate in Public-Private Projects or as participants in fulfillment of City Contracts, this Policy shall be incorporated by reference into relevant contracts as a material term, enforceable by the City as a third-party beneficiary.
- b. All parties with responsibilities under this Policy agree to provide information requested by the City as necessary to determine compliance with this Policy. Developers, Prime Contractors, and Employers shall provide annual public reports regarding compliance with this Policy.
- c. Developers, Construction Contractors, and Employers are subject to liquidated damages in cases of noncompliance with this Policy. Liquidated damages shall be assessed by the City only in cases of sustained, material noncompliance, and after notice and opportunity to correct. Developers, Construction Contractors, and Employers also agree to remedies of specific performance and other contractual or equitable remedies related to compliance with this Policy.
- d. If any provision of this Policy or any application thereof to any person or circumstances is held invalid by final judgment of any court of competent jurisdiction, such invalidity shall not affect other provisions or application of this Policy, which can be given effect without the invalid provision or application, and to this end the provisions of this Policy are declared to be severable.

4. Nondiscrimination Policy

Each Construction Contractor, Employer, and Developer shall refrain from discrimination or harassment based on race, ethnicity, national origin, gender, gender identity, sexual orientation, age, religion, disability, veteran status, or any other basis prohibited by law, in all activities in furtherance of or on site of work performed in relation to a City Contract or a Public-Private Project. Such entities shall take active steps to ensure that all activities related to City Contracts and Public-Private Projects are conducted without discrimination or harassment on these bases by all employees and representatives.

[INTENTIONALLY LEFT BLANK]

CITY OF NEW ROCHELLE MONTHLY EMPLOYMENT UTILIZATION REPORT

CONTRACTOR _____
 ADDRESS _____
 PROJECT _____

OFFICIAL SIGNATURE AND TITLE, _____
 TELEPHONE NUMBER _____
 DATE SIGNED _____

CONSTRUCTION
 TRADE
 CLASSIFICATIONS

TOTAL
 EMPLOYEES

BLACK

HISPANIC

FEMALE

MINORITY
 PERCENTAGE

FEMALE
 PERCENTAGE

	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						
	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						
	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						
	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						
	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						
TOTALS	Journey Worker APPRENTICE TRAINEE SUB-TOTAL						

I. NEW YORK STATE AFFIRMATIVE ACTION REQUIREMENTS

(BID CONDITIONS – EQUAL EMPLOYMENT OPPORTUNITY)

(For all State and State-Assisted Construction Contracts to be awarded in this County of the State of New York, with the exception of those contracts which involve Federal assistance and for which Federal Bid Conditions are required).

PART I

The provisions of this Part I apply to Bidders, Contractors and Subcontractors with respect to those construction trades for which they are parties to collective bargaining agreements with a labor organization or organizations and who together with such labor organizations have agreed to the Westchester County, New York area Equal Employment Opportunity Agreement (but only as to those trades as to which there are commitments by labor organizations to specific goals of minority manpower utilization) between the Building Trades Employers Association of said County, the Builder's Institute of Westchester & Putnam Counties, various labor organizations, General and Specialty Contractors and their associations and the minority coalition, together with all implementing agreements that have been and may hereafter be developed pursuant thereto, all of which documents are incorporated herein by reference and are hereinafter cumulatively referred to as the "Westchester County Plan."

Any Bidder, Contractor or Subcontractor using one or more trades of construction employees must either comply with Part I or Part II or these Bid Conditions as to each such trade. Thus, a Bidder, Contractor or Subcontractor may be in compliance with these conditions by its inclusion, with its union, in the Westchester County Plan as to trade "A", provided there is set forth in the Westchester County Plan a specific commitment by that union to a goal of minority manpower utilization for such trade "A", thereby meeting the provisions of this Part I, and by its commitment to Part II in regard to trade "B" in the instance in which it is not included in the Westchester County Plan, and, therefore, cannot meet the provisions of this Part I.

To be eligible for award of a contract under Part I of this invitation, a Bidder or Subcontractor must execute the certification required by Part III hereof.

PART II

A. COVERAGE

The provisions of this Part II shall be applicable to those Bidders, Contractors, and Subcontractors, who, in regard to those construction trades to be utilized on the Project to which these bid conditions pertain:

1. Are not or hereafter cease to be signatories to the Westchester County Plan referred to in Part I hereof;
2. Are signatories to the Westchester County Plan, but are not parties to collective bargaining agreements;
3. Are signatories to the Westchester County Plan, but are parties to collective bargaining agreements with labor organizations who are not or hereafter cease to be signatories to the Westchester County Plan.

4. Are signatories to the Westchester County Plan but as to which no specific commitment to goals of minority manpower utilization by labor organization have been executed pursuant to the Westchester County Plan; or,
5. Are no longer participating in an affirmative action plan acceptable to the Industrial Commissioner, including the Westchester County Plan.

B. REQUIREMENT: AN AFFIRMATIVE ACTION PLAN:

The bidders, contractors and subcontractors described in paragraphs 1 through 5 aforementioned will not be eligible for award of a contract under this Invitation for Bids, unless it certifies as prescribed in paragraph 2b of the certification specified in Part III hereof that it adopts the minimum goals and timetables of minority manpower utilization (1) and specific affirmative action steps set forth in Section B.1 and 2 of this Part II directed at increasing minority manpower utilization by means of applying good faith efforts to carrying out such steps; or is deemed to have adopted such a program pursuant to Section B.3 of this Part II.

1. Goals and Timetables:

The goals of minority manpower utilization required of the bidder and subcontractors are applicable to each trade not otherwise bound by the provisions of Part I hereof which will be used on the project in Westchester County, New York (hereinafter referred to as the "Area") shall be 11.0%-13.0%.

The percentage goals of minority manpower utilization aforementioned are expressed in terms of man-hours of training and employment as a proportion of the total man-hours to be worked by the Bidder's, Contractor's and Subcontractor's entire work force in that trade on all projects (both state and non-state) in the Area during the performance of its Contract or Subcontract. The man-hours for minority work and training must be substantially uniform throughout the length of the contract, on all projects and for each of the trades. Further, the transfer of minority employees or trainees from employer-to-employer or from project-to-project for the sole purpose of meeting the contractor's or subcontractor's goal shall be a violation of these conditions. In reaching the goals of minority manpower utilization required of bidder, contractors and subcontractors pursuant to this Part II, every effort shall be made to find and employ qualified journeymen. However, where minority journeymen are not available, minority trainees in pre-apprenticeship, apprenticeship, journeyman training or other training programs may be used.

In order that the non-working training hours of trainees may be counted in meeting the goal, such trainees must be employed by the contractor during the training period, the contractor must have made a commitment to employ the trainees at the completion of their training subject to the availability of employment opportunities and the trainees must be trained pursuant to established training programs which must be the equivalent of the training programs now or hereafter provided for in the Westchester County Plan with respect to the nature, extent and duration of training offered.

A contractor or subcontractor shall be deemed to be in compliance with the terms and requirements of this Part II by the employment and training of minorities in the appropriate percentage of his aggregate work force in the Area for each trade for which it is committed to a goal under this Part II.

However, no contractor or subcontractor shall be found to be in non-compliance solely on account of its failure to meet its goals within its timetables, but such Contractor shall be given the opportunity to demonstrate that it has instituted all of the specific affirmative action steps specified in this Part II and has made every good faith effort to make these steps work toward the attainment of its goals within its timetables, all to the purpose of expanding minority manpower utilization on all of its projects in the Area.

In all cases, the compliance of a bidder, contractor or subcontractor will be determined in accordance with its respective Obligations under the terms of these Bid Conditions. Therefore, contractors or subcontractors who are governed by the provisions of this Part II shall be subject to the requirements of that Part regardless of the obligations of its prime contractor or low tier subcontractors.

2. All bidders and all contractors and subcontractors performing or to perform work on projects subject to these Bid Conditions hereby agree to inform their subcontractors of their respective obligations under the terms and requirements of these Bid Conditions, including the provisions relating to goals of minority employment and training.
3. Specific Affirmative Action Steps: Bidders, contractors and subcontractors subject to this Part II must engage in affirmative action directed at increasing minority manpower utilization, which is at least as extensive and as specific as the following steps:
 - a. The Contractor shall notify community organizations that the Contractor has employment opportunities available and shall maintain records of the organizations' response.
 - b. The Contractor shall maintain a file of the names and addresses of each minority worker referred to him/her and what action was taken with respect to each such referred worker, and if the worker was not sent to the union hiring hall for referral or if such worker was not employed by the contractor, the contractor's file shall document this and the reasons therefore.
 - c. The Contractor shall promptly notify the City when the union or unions with whom the Contractor has a collective bargaining agreement has not referred to the Contractor a minority worker sent by the Contractor or the Contractor has other information that the union referral has impeded Contractor in efforts to meet goal.
 - d. The contractor shall participate in training programs in the area, especially those funded by the Department of Labor.
 - e. The contractor shall disseminate EEO policy within own organization by including it in any policy manual, by publicizing it in company newspapers, annual reports, etc., by conducting staff, employee and union representatives' meetings to explain and discuss the policy, by posting of the policy, and by specific review of the policy with minority employees.

- f. The contractor shall disseminate his EEO policy externally by informing and discussing it with all recruitment sources, by advertising in news media, specifically including minority news media, and by notifying and discussing it with all subcontractors and suppliers.
 - g. The contractor shall make specific and constant personal (both written and oral) recruitment efforts directed at all minority organizations, schools with minority students, minority recruitment organizations, and minority training organizations, within the contractor's recruitment area.
 - h. The contractor shall make specific efforts to encourage present minority employees to recruit their friends and relatives.
 - i. The contractor shall validate all worker specifications, selection requirements, test, etc.
 - j. The contractor shall make every effort to promote after-school, summer and vacation employment to minority youth.
 - k. The contractor shall develop on-the-job training opportunities and participate and assist in any association or employer-group training programs relevant to the contractor's employee needs consistent with its obligations under this Part II.
 - l. The contractor shall continually inventory and evaluate all minority personnel for promotion opportunities and encourage minority employees to seek such opportunities.
 - m. The contractor shall make sure that seniority practices, job classifications, etc., do not have a discriminatory effect.
 - n. The contractor shall make certain that all facilities and company activities are non-segregated.
 - o. The contractor shall continually monitor all personnel activities to ensure that EEO policy is being carried out.
 - p. The contractor shall solicit bids for subcontracts from available minority subcontractors engaged in the trades covered by these Bid Conditions, including circulation of minority contractor associations.
4. Contractors and Subcontractors Deemed to be Bound by Part II: In the event a Contractor or Subcontractor, who is at the time of bidding eligible under Part I of these Bid Conditions, is no longer participating in an affirmative action plan acceptable to the Industrial Commissioner, including the, shall be deemed to be committed to Part II of these Bid Conditions. Further, whenever a contractor or subcontractor is deemed to be committed to Part II of these Bid Conditions shall be considered to be committed to a manpower utilization percentage goal of the minimum range for that trade for the appropriate year.
5. Subsequent Signatory to the Westchester County Plan: Any contractor or subcontractor subject to the requirements of this Part II for any trade at the time of the submission of his bid who together with the labor organization with whom it has a collective bargaining agreement subsequently becomes a signatory to the Westchester County Plan, either individually or through an association, may meet its requirements under these Bid Conditions for such trade, if such contractor or subcontractor executes and submits a new certification committing to Part I of these Bid Conditions. No contractor or subcontractor shall be deemed to be subject to the requirements of Part I until such certification is executed and submitted.

6. Non-Discrimination: In no event may a contractor or subcontractor utilize the goals, timetables or affirmative action steps required by this Part II in such a manner as to cause or result in discrimination against any person on account of race, color, religion, sex or national origin.

(NO TEXT HERE)

PART III

A. BIDDER'S CERTIFICATIONS

A bidder will not be eligible for award of a contract under this Invitation for Bids unless such bidder has submitted as a part of its bid the following certification, which will be deemed a part of the resulting Contract:

BIDDERS' CERTIFICATION

_____ certifies that:
(Bidder)

1. It intends to use the following listed construction trades in the work under the Contract:

_____ ; and

- a. As to those trades set forth in the preceding paragraph one hereof for which it is eligible under Part I of these Bid Conditions for participation in the Westchester County Plan, it will comply with the Westchester County area within the scope of coverage of that Plan, those trades being:

_____, and/or

- b. As to those trades for which it is required by these Bid Conditions to comply with Part I of these Bid Conditions, it adopts the minimum minority manpower utilization goals and the specific affirmative action steps contained in said Part II , for all construction work (both state and non-state) in the Westchester County area subject to these Bid Conditions, those trades being:

_____ and

2. It will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor certification required by these Bid Conditions.

(Signature of authorized representative of bidder)

B. SUBCONTRACTORS' CERTIFICATIONS

Prior to the award of any subcontract under this Invitation for bids, regardless of tier, the prospective subcontractor must execute and submit to the Prime Contractor the following certification, which will be deemed a part of the resulting subcontract:

SUBCONTRACTORS' CERTIFICATION

_____certifies that:
(Subcontractor)

1. It intends to use the following listed construction trades in the work under the subcontract

_____;

2. a. As to those trades set forth in the preceding paragraph one hereof for which it is eligible under Part I of these Bid Conditions for participation in the Westchester County Plan, it will comply with the Westchester County Plan on all construction work (both state and non-state) in the Westchester County area subject to these Bid Condition, those trades being: _____

_____; and

b. As to those trades for which it is required by these Bid Conditions to comply with Part II of these Bid Conditions, it adopts the minimum minority manpower utilization goals and the specific affirmative action steps contained in said Part II for all construction work (both state and non-state) in the Westchester County area subject to these Bid Conditions, those trades being:

_____; and

3. It will obtain from each of its subcontractors prior to the award of any subcontract under this subcontract the subcontractor certification required by these Big Conditions.

X _____

(Signature of authorized representative of bidder)

In order to ensure that the said subcontractors' certification becomes a part of all subcontracts under the prime contract, no subcontract shall be executed until an authorized representative of the City has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

C. MATERIALLY AND RESPONSIVENESS

The certifications required to be made by Bidder pursuant to these Bid Conditions is material, and will govern the Bidder's performance on the project and will be made a part of bid. Failure to submit the certification will render the bid non-responsive.

PART IV – COMPLIANCE AND ENFORCEMENT

Contractors are responsible for informing their Subcontractor (regardless of tier) as to their respective obligations under Parts I and II hereof (as applicable). Bidders, Contractors and Subcontractors hereby agree to refrain from entering into any contract or contract modification with a Contractor debarred from, or who is determined not to be a "Responsible" Bidder for, state contracts and state-assisted construction contracts. The Bidder, Contractor or Subcontractor shall carry out such sanctions and penalties for violation of the equal opportunity clause including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered by the administering agency or the contracting agency. Any Bidder, Contractor or Subcontractor who shall fail to carry out such sanctions and penalties shall be deemed to be in non-compliance with these Bid Conditions.

Nothing herein is intended to relive any Contractor or Subcontractor during the term of its contract on this project from compliance with the Equal Opportunity Clause of its contract, with respect to matters not covered in the Westchester County Plan or in Part II of these Bid Conditions.

Violation of any substantial requirement in the Westchester County Plan by a Contractor or Subcontractor covered by Part I of these Bid Conditions including the failure of such Contractor or Subcontractor to make a good faith effort to meet its fair share of the trade's goals of minority manpower utilization, or of the requirements of Part II hereof by a Contractor or Subcontractor who is covered by Part II shall be deemed to be non-compliance by such Contractor or Subcontractor with the Equal Opportunity Clause of the contract, and shall be grounds for imposition of appropriate sanctions and penalties.

Each agency shall review its Contractors' and Subcontractors' employment practices during the performance of the contract. If the agency determines that the Westchester County Plan no longer represents effective affirmative action, it shall so notify the New York State Department of Labor (NYSDOL) which shall be solely responsible for any final determination of that question and the consequences thereof.

In regard to Part II of these conditions if the Contractor or Subcontractor meets its goals or if the Contractor or Subcontractor can demonstrate that it has made every good faith effort to meet those goals, the Contractor or Subcontractor shall be presumed to be in compliance with its obligations under these Bid Conditions and no formal sanctions or proceedings leading toward sanctions shall be instituted unless the agency otherwise determines that the Contractor or Subcontractor is not providing equal employment opportunities. In judging whether a Contractor or Subcontractor has met its goals; the agency will consider each Contractor's or Subcontractor's minority manpower utilization of its Subcontractors. Where the agency finds that the Contractor or Subcontractor has failed to comply with its obligations under these Bid Conditions, the agency shall take such action and impose such sanctions as may be appropriate. When the agency proceeds with such formal action it has the burden of proving that the Contractor has not met the requirements of these Bid Conditions, but the Contractor's failure to meet his goals shall shift to him the requirement to come forward with evidence to show that he has met the "good faith" requirements of these Bid Conditions by instituting at least the Specific Affirmative Action steps listed above and by making every good faith effort to make those steps work toward the attainment of its goals within its timetables.

Contractors and Subcontractors must keep such records and file such reports relating to the provisions of these Bid Conditions as shall be required by the contracting or administering agency or the Department of Labor.

For the information of Bidders, a copy of the Westchester County Plan may be obtained from the contracting officer.

(NO TEXT HERE)

**SECTION B
BID PROPOSAL**

Fed. ID# (or SS#) _____

Proposal of _____

(hereinafter-called 'Bidder') (a

_____ corporation/ a Partnership/ an individual
doing business as

_____, to the _____ (hereinafter called
Owner) _____

The Bidder, in compliance with your Invitation for Bids for the construction of

_____ having
examined the Bid Documents and the site of the proposed work, and being familiar with all of the
conditions surrounding the construction of the proposed project including the availability of
materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct
the project in accordance with the Bid Documents, within the time set forth therein, and at the
prices stated below. These prices are to cover all expenses incurred in performing the work
required under the Bid Documents, of which this proposal becomes a part thereof.

Bidder hereby agrees to commence work under this contract on or before a date to be
specified in written "Notice to Proceed" of the Owner and to fully complete the project within
consecutive calendar days thereafter as stipulated in the Bid Documents. Bidder further agrees to
pay as liquidated damages, the sum set forth in Schedule A for each consecutive calendar day
there after that the work is not completed as hereinafter provided in the General and Special
Conditions of the Contract Documents.

Bidder acknowledges receipt of the following addendum (LIST ALL):

<u>ADDENDUM</u>	<u>DATE</u>	<u>SIGNATURE OF PERSON SIGNING PROPOSAL</u>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

TOTAL BID PRICE: Bidder agrees to perform all of the _____ work
described in the Bid Documents for the sum of _____
_____ (Amount shall be shown in both
words and figures. In case of discrepancy, the amount shown in words will govern.)

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 45 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this Bid, Bidder will execute a formal contract with the Owner and deliver the required Insurance Coverage and Surety Bonds within ten (10) business days thereafter.

The bid security attached in the sum of _____
_____ \$ _____ is to
become the property of the Owner in the event the required Bonds and Insurance are not provided and the contract is not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully Submitted:

BY: _____

(Signature)

(Title)

(SEAL· if Bid is by a corporation)

CONTRACTOR'S QUALIFICATION STATEMENT

The signatory of this questionnaire certifies under oath the truth and correctness of all statements and of all answers to interrogatories hereinafter made.

SUBMITTED TO: Commissioner of Public Works City of New Rochelle

SUBMITTED BY: _____ A Corporation
 _____ A Co- Partnership
 _____ An Individual

PRINCIPAL OFFICE: _____
 Tel: _____

<u>Title</u>	<u>Name</u>	<u>Address</u>	<u>Background</u> <u>Profession of Trade</u>

Persons of firms submitting bids must be engaged in the liens of work required in these specifications or shall be able to refer to work of similar character performed by them. Proposers must present satisfactory evidence of experience, ability and financial standing, and also a statement as to their plant and machinery.

1. How many years has your organization been in business as a general contractor under its present name?

2. We normally perform _____% of the work without own forces. List trades below:

3. Have you ever failed to complete any work awarded to you? _____ if so, note where and why.

4. List the major construction projects your organization has under way on this date.

5. DESIGNATION OF ASPHALTIC CONCRETE MIXING PLANT

Whenever asphaltic concrete paving is included in the scope of the contract, this form shall be completed in full and made a binding part of the Bidder's Proposal. In the event that the plant designated is not owned by the Contractor, before the award is made he shall be required to furnish a statement from the Plant Owner that the asphaltic concrete material required under the Contract will be furnished in accordance with the specifications, and at a rate sufficient to progress the work properly to the satisfaction of the Commissioner of Public Works.

All plant asphaltic concrete required under this contract will be manufacture at the plant of _____ located at _____ except that, in the event of an emergency, to be determined by the Commissioner of Public Works, the same may be manufactured elsewhere.

Bidder _____

By _____

Title _____

6. List five (5) major projects your organization has completed in the past five (5) years:

Project	Owner	Architect	Contract Amount	Completion Date

7. List the construction experience of the principal individuals of your organization (particularly the Anticipated Project Supervisors)

Individual's Name	Present Position or Office	Years of Experience	Types of work for which responsible	In What Capacity

8. Itemized list of Bidder's major plant and equipment:

9. Bank References

10. Trade Association Membership

11. Attach State of Financial Conditions, including contractor's latest regular dated financial statement or balance sheet.

Date of current statement or balance sheet: _____

Name of Firm preparing statement: _____

Dated at _____ this _____ day of _____ 20____

Name of Organization: _____

By: _____

Title: _____

STATE OF _____)
COUNTY OF _____) SS:

As _____ being duly sworn
deposes and says that he/she is the _____ of
_____ Contractor and
that answers to the foregoing questions and all statements therein contained are true and
correct.

SWORN TO BEFORE ME THIS _____ DAY OF _____

NOTARY PUBLIC

My Commission Expires:

CERTIFICATE OF CONTRACTOR'S QUALIFICATION STATEMENT

CURRENT

I certify that (our) (my) Qualification Statement dated _____

as on file with the Department of Public Works, City of New Rochelle, New York, is current

and that it reflects (our) (my) organization, operations, and financial status as of this

_____ day of _____:

with the following exceptions:

STATE OF _____)
) ss:
COUNTY OF _____)

As _____ being duly sworn
deposes and says that he/she is the _____ of
_____ Contractor and
that answers to the foregoing questions and all statements therein contained are true and
correct.

SWORN TO BEFORE ME THIS _____ DAY OF _____

NOTARY PUBLIC

My Commission Expires:

STATEMENT OF NON-COLLUSION

(To Be Completed by Each Bidder)

In accordance with Section 103-d General Municipal Law, effective September 1, 1966, every bid or proposal hereafter made to a political subdivision of the State or any public department, agency, or official thereof or to a fire district or any agency or official thereof for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed to by the Bidder and affirmed by such Bidder as true under the penalties of perjury; non-collusive bidding certification.

- a. 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 knowledge and belief:
 1. 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 any competitor.
 2. 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.
 3. 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.
- b. The person signing this bid or proposal certifies that he has fully informed himself/herself regarding the accuracy of the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the Bidder, as well as the person signing in its behalf.
- c. That attached hereto (if a Corporate Bidder) is a certified copy of resolution authorizing the execution of this certificate by the signator of this bid or proposal in behalf of the Corporate Bidder.

RESOLUTION

Resolved that _____ be
(Name of Corporation)

authorized to sign and submit the bid or proposal of this corporation for the following
project

(Describe Project)

and to include in such bid or proposal the certificate as to non-collusion required by section
one-hundred-three-d (103-d) of the General Municipal Law as the act and deed of such
Corporation, and for any inaccuracies or mis-statements in such certificate this corporate
Bidder shall be liable under the penalties of perjury.

The foregoing is a true and correct copy of the resolution adopted by _____
_____ Corporation at a meeting of
the Board of Commissioners held on the _____ day of _____.

(SEAL OF THE CORPORATION)

Secretary

NEW YORK STATE AFFIRMATIVE ACTION CERTIFICATION
(TO BE COMPLETED BY EACH BIDDER)

Bidder's Certifications: (See Section I, Part III)

A Bidder will not be eligible for award of a contract under this Invitation for Bids unless such Bidder has submitted as a part of its bid the following certification, which will be deemed a part of the resulting contract:

BIDDERS CERTIFICATION

(Bidder)

Certifies that:

1. It intends to use the following listed construction trades in the work under the Contract

_____ and;

2.

- a. As to those trades set forth in the preceding paragraph one hereof for which it is eligible under Part I of these Bid Conditions, it will comply with the Westchester County Affirmative Action requirements for Public Works Contracts, area within the scope of coverage of that Plan, those trades being:

_____ and/or;

- b. As to those trades for which it is required by these Bid Conditions to comply with Part II of these Bid Conditions, it adopts the minimum minority manpower utilization goals and the specific affirmative action steps contained in said Part II, for all construction work (both state and non-state) in the aforementioned area subject to these Bid Conditions, those trades being:

_____ and;

3. It will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontractor under this contract the subcontractor certification required by these Bid Conditions.

(Signature of Authorized Representative of Bidder)

City of New Rochelle, New York
40 Pelham Rd Interior Renovations (Project # 23-012)

BASE BID ITEMS					
Item	Description	Estimated Quantity	Units	Unit Price	Total Price
1	New ADA Men's Rm. (excl. exhaust & epoxy floor)	1	LS		
2	New ADA Women's Rm. (excl. exhaust & epoxy floor)	1	LS		
3	Men's & Women's Room Exhaust System	1	LS		
4	New Locker Room (excl. epoxy flooring)	1	LS		
5	Expanded Lounge (excl. HVAC & flooring)	1	LS		
6	Expanded Lounge - HVAC System	1	LS		
7	Epoxy Floor	3200	SQFT		

TOTAL BID PRICE: _____

TOTAL BID PRICE IN WORDS _____

ADD ALTERNATE ITEMS					
Item	Description	Estimated Quantity	Units	Unit Price	Total Price
A1	Admin Office - Kitchennette	1	LS		
A2	Admin Office - Window	1	EA		
A3	Admin Office - Split Unit HVAC System	1	LS		

Bidder agrees to perform all of the work described in the Bid Documents for the Total Bid Price (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern).

Upon receipt of written notice of the acceptance of this Bid, Bidder will execute a formal contract with the Owner and deliver the required Insurance Coverage and Surety Bonds within ten (10) business days thereafter.

The attached Bid security is to become the property of the Owner in the event the required Bonds and Insurance are not provided and the contract is not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully Submitted By:

Company Name: _____

Address: _____

Phone #: _____

Email: _____

Authorized Signature: _____

(Seal: if Bid is by Corporation)

TABLE OF CONTENTS

	PAGE
GENERAL AGREEMENT	
CHAPTER I THE CONTRACT AND DEFINITIONS	C-1
ARTICLE 1. THE CONTRACT	C-1
ARTICLE 2. DEFINITIONS	C-1
CHAPTER II THE WORK AND ITS PERFORMANCE	C-3
ARTICLE 3. CHARACTER OF THE WORK; WORKMANSHIP AND MATERIALS	C-3
ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION	C-4
ARTICLE 5. CONTRACTORS	C-5
ARTICLE 6. INSPECTION AND ACCEPTANCE	C-6
ARTICLE 7. PROTECTION OF WORK AND OF PERSONS AND PROPERTY: NOTICES AND INDEMNIFICATION	C-7
CHAPTER III TIME PROVISIONS	C-8
ARTICLE 8. COMMENCEMENT AND PROSECUTION OF WORK; TIME FOR COMPLETION; LIQUIDATED DAMAGES	C-8
ARTICLE 9. PROGRESS SCHEDULES	C-11
ARTICLE 10. COORDINATION WITH OTHER CONTRACTORS	C-11
ARTICLE 11. NO DAMAGES FOR DELAY	C-13
ARTICLE 12. SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE OF WORK	C-13
ARTICLE 13. OCCUPATION OR USE PRIOR TO COMPLETION	C-14
CHAPTER IV SUBCONTRACTS AND ASSIGNMENTS	C-14
ARTICLE 14. SUBCONTRACTS	C-14
ARTICLE 15. ASSIGNMENTS	C-16
[ARTICLES 16, 17 AND 18 INTENTIONALLY OMITTED]	C-16
CHAPTER V CONTRACTOR'S SECURITY AND GUARANTY	C-16
ARTICLE 19. PERFORMANCE SECURITY	C-16
ARTICLE 20. RETAINED PERCENTAGES	C-16
ARTICLE 21. MAINTENANCE AND GUARANTY	C-17
ARTICLE 22. INSURANCE	C-17
ARTICLE 23. MONEY RETAINED AGAINST CLAIMS	C-17
CHAPTER VI CHANGES, EXTRA WORK AND DOCUMENTATION OF CLAIM	C-18
ARTICLE 24. CONTRACT CHANGES	C-18
ARTICLE 25. METHODS OF PAYMENT FOR EXTRA WORK	C-18
ARTICLE 26. DISPUTES	C-21
ARTICLE 27. RECORD KEEPING FOR EXTRA WORK OR DISPUTED WORK	C-23
ARTICLE 28. OMITTED WORK	C-24
ARTICLE 29. NO ESTOPPEL	C-24

ARTICLE 30. WAIVER, MODIFICATIONS AND APPROPRIATIONS	C-24
CHAPTER VII POWERS OF THE RESIDENT ENGINEER AND COMMISSIONER	C-25
ARTICLE 31. THE RESIDENT ENGINEER	C-25
ARTICLE 32. THE COMMISSIONER	C-25
CHAPTER VIII CONTRACT PRICE AND PAYMENTS	C-26
ARTICLE 33. CONTRACT PRICE	C-26
ARTICLE 34. PARTIAL PAYMENTS	C-26
ARTICLE 35. CONTRACTOR'S PAYMENT TO SUBCONTRACTORS	C-27
ARTICLE 36. SUBSTANTIAL COMPLETION PAYMENT	C-27
ARTICLE 37. FINAL PAYMENT	C-28
ARTICLE 38. ACCEPTANCE OF FINAL PAYMENT	C-28
ARTICLE 39. LIENS	C-29
ARTICLE 40. WITHHOLDING OF PAYMENTS	C-29
CHAPTER IX LABOR PROVISIONS	C-29
ARTICLE 41. EMPLOYEES	C-29
ARTICLE 42. AFFIRMATIVE ACTION POLICIES; EMPLOYER AND PROFESSIONAL RESPONSIBILITIES	C-30
ARTICLE 43. LABOR LAW PROVISIONS	C-30
ARTICLE 44. NON-DISCRIMINATION REQUIREMENTS	C-32
CHAPTER X CONTRACTOR'S DEFAULT; TERMINATION	C-32
ARTICLE 45. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT	C-32
ARTICLE 46. QUITTING THE SITE	C-34
ARTICLE 47. TERMINATION BY THE CITY	C-34
ARTICLE 48. COMPLETION OF THE WORK	C-35
ARTICLE 49. PARTIAL DEFAULT	C-35
ARTICLE 50. PERFORMANCE OF UNCOMPLETED WORK	C-36
ARTICLE 51. OTHER REMEDIES	C-36
CHAPTER XI MISCELLANEOUS PROVISIONS	C-36
ARTICLE 52. CITY'S RIGHT TO AUDIT AND INSPECT RECORDS	C-36
ARTICLE 53. BUSINESS ETHICS	C-37
ARTICLE 54. INVESTIGATION CLAUSE	C-38
ARTICLE 55. CONTRACTOR'S WARRANTIES	C-40
ARTICLE 56. CONTRACTOR PERFORMANCE EVALUATION AND CRITERIA	C-40
ARTICLE 57. CLAIMS AND ACTIONS	C-41
ARTICLE 58. NO CLAIM AGAINST OFFICIALS, OFFICERS, AGENTS OR EMPLOYEES	C-41
ARTICLE 59. INFRINGEMENTS	C-42
ARTICLE 60. NOTICES	C-42
ARTICLE 61. SEVERABILITY	C-42
ARTICLE 62. ANTITRUST ASSIGNMENT	C-42
ARTICLE 63. CHOICE OF LAW	C-42

ARTICLE 64. TAX EXEMPTION	C-43
ARTICLE 65. COMPLIANCE WITH LAWS	C-43
ARTICLE 66. MERGER CLAUSE	C-43
ARTICLE 67. CONFLICTS; HEADINGS	C-43

CITY OF NEW ROCHELLE**GENERAL AGREEMENT**

THIS GENERAL AGREEMENT is made and entered into this ____ day of _____, 20__, by and between the City of New Rochelle, a municipal corporation of the State of New York, having offices at 515 North Avenue, New Rochelle, New York 10801 (“City”), and _____, a _____, having offices at _____ (“Contractor”).

WITNESSETH:

The parties, in consideration of the mutual agreements contained herein, agree as follows:

CHAPTER I: THE CONTRACT AND DEFINITIONS**ARTICLE 1. THE CONTRACT**

1.1 Except for titles, subtitles, headings, running headlines, tables of contents, and indices (all of which are printed herein merely for convenience) the following, except for such portions thereof as may be specifically excluded, shall be deemed to be part of this Contract:

- 1.1 The Advertisement;
- 1.2 The Information For Bidders;
- 1.3 The Bid and Bidder’s Affidavit;
- 1.4 This General Agreement;
- 1.5 Schedule “A” to the General Agreement;
- 1.6 The Specifications;
- 1.7 The Contract Drawings;
- 1.8 All Addenda issued by the City;
- 1.9 All provisions required by Law to be inserted in this Contract, whether actually inserted or not;
- 1.10 The Notice of Award;
- 1.11 Performance and Payment Bonds and Insurance Policies and Certificates; and,
- 1.12 Notice to Proceed.

ARTICLE 2. DEFINITIONS

2.1 The following words and expressions, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless a different meaning is clear from the context:

- 2.1.1 “Addendum” or “Addenda” shall mean the additional Contract provisions and/or technical clarifications issued in writing by the City prior to the receipt of bids.
- 2.1.2 “Allowance” shall mean a sum of money which the City may include in the total amount of the Contract for such specific contingencies as the City believes may be necessary to complete the Work, and for which the Contractor will be paid on the basis of stipulated

unit prices or a formula set forth in the Contract or negotiated between the parties provided, however, that if the Contractor is not directed in writing to use the Allowance, the Contractor shall have no right to such money and it shall be deducted from the total amount of the Contract.

- 2.1.3 “City” shall mean the City of New Rochelle.
- 2.1.4 “Commissioner” shall mean the head of the Department of Public Works for the City and/or his duly authorized representatives.
- 2.1.5 “Contract” or “Contract Documents” shall mean each of the various parts of the Contract referenced in Article I hereof, as a whole and severally.
- 2.1.6 “Contract Drawings” shall mean only those drawings specifically entitled as such and listed in the Specifications or in any Addendum, or any drawings furnished by the Resident Engineer pertaining or supplemental thereto.
- 2.1.7 “Contractor” shall mean the party defined in the preamble hereto, and its, their, his/her successors, personal representatives, executors, administrators, and assigns, and any person or entity which shall at any time be substituted in the place of the Contractor under this Contract.
- 2.1.8 “Contract Work” shall mean everything required to be furnished and done by the Contractor by any part or parts of the Contract referred to in Article 1, except Extra Work as hereinafter defined; it being understood that in case of any inconsistency between any part or parts of this Contract, the Resident Engineer shall determine what shall prevail.
- 2.1.9 “Days” shall mean calendar days, except where otherwise specified.
- 2.1.10 “Extra Work” shall mean Work, materials and/or equipment needed to complete the Project that was not required by the Contract at the time of its execution.
- 2.1.11 “Final Acceptance” shall mean final written acceptance of all Work by the City after the period of maintenance set forth in Article 21.
- 2.1.12 “Final Approved Punch List” shall mean a list, approved pursuant to Article 12.1.2, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.
- 2.1.13 “Law” or “Laws” shall mean the Constitution of the State of New York, the New Rochelle City Charter and Code, a statute of the United States or of the State of New York, a local law of the City of New Rochelle, and any ordinance, rule, regulation or judicial decision having the force of law, or common law.
- 2.1.14 “Materialman” shall mean any person, firm or corporation, other than employees of the Contractor, who or which contracts with the Contractor or any Subcontractor to fabricate or deliver, or who actually fabricates or delivers, plant, materials or equipment to be incorporated in the Work.
- 2.1.15 “Means and Methods of Construction” shall mean the labor, materials, temporary structures, tools, plants, and construction equipment, and the manner and time of their use, necessary to accomplish the result intended by this Contract.
- 2.1.16 “Notice to Proceed” shall mean the written notice issued by the Commissioner specifying the time for commencement of the Work.
- 2.1.17 “Other Contractor(s)” shall mean any contractor, other than the Contractor who executed this Contract or its Subcontractors, who has a contract with the City for work on or adjacent to the Site of the Work.
- 2.1.18 “Project” shall mean the public improvement to which this Contract relates.

- 2.1.19 “Required Quantity” in a unit price Contract shall mean the actual quantity of any item of Work or materials which is required to comply with the Contract.
- 2.1.20 “Resident Engineer” shall mean the City Engineer or his/her designee, including a private architect, engineer or project manager, as the case may be.
- 2.1.21 “Site” shall mean the area upon or in which the Contractor’s operations are carried on, and such other adjacent areas as may be designated by the Resident Engineer.
- 2.1.22 “Specifications” shall mean all of the directions, requirements, and standards of performance applying to the Work needed to complete the Project.
- 2.1.23 “Subcontractor” shall mean any person, firm or corporation, other than employees of the Contractor, who contracts with the Contractor or with its Subcontractors to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or superintendence, supervision and/or management at the Site.
- 2.1.24 “Substantial Completion” shall mean the written determination by the Resident Engineer that the Work required under this Contract is substantially, but not entirely, and approved pursuant to Article 12.
- 2.1.25 “Work” shall mean everything required to be furnished and done by the Contractor to complete the Project in accordance with the Contract Documents, including without limitation, labor, material, superintendence, management, administration, equipment, and incidentals, and obtaining any and all permits, certifications, approvals and licenses as may be necessary and required to complete the Work, and shall include both Contract Work and Extra Work.

CHAPTER II: THE WORK AND ITS PERFORMANCE

ARTICLE 3. CHARACTER OF THE WORK; WORKMANSHIP AND MATERIALS

3.1 Character of Work. Unless otherwise expressly provided in the Contract Drawings, Specifications, and Addenda, the Work shall be performed in accordance with the best modern practices, utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship and design of the highest quality, to the satisfaction of the City.

3.2 Workmanship. The Contractor shall, in a good workmanlike manner, perform all of the Work required by the Contract within the time specified in the Contract to the satisfaction of the City. The Contractor shall provide, erect, maintain and remove such construction, plant, and temporary work as may be required. The Contractor shall be responsible for the safety, efficiency, and adequacy of the Contractor’s plant, appliances, and methods, and for damage which may result from failure or improper construction, maintenance or operation of said plant, appliances and methods.

3.3 Contractor’s Title to Materials. No materials or supplies for the Work shall be purchased by the Contractor or any Subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that it has full, good and clear title to all materials and supplies used by the Contractor in the Work, or resold to the City pursuant to the Contract, free from all liens, claims or encumbrances. All materials and equipment which become the property of the City shall be new unless specified otherwise.

3.4 “Of Equal” Clause. Whenever a material, article or equipment is identified on the plans or in the Specifications by reference to a manufacturer’s or vendor’s name, trade name, catalogue number, or make, said identification is intended to establish a standard. Any materials, articles or equipment of other manufacturers and vendors which perform the same duties imposed by the general design may be considered equally acceptable provided that, in the opinion of the Resident Engineer, the material, article or equipment so proposed is of equal quality, substance and function and the Contractor shall not provide, or install any such proposed material, article or equipment without the prior written approval of the City.

3.4.1 Where the Resident Engineer approves a product proposed by the Contractor and the proposed product requires a revision or redesign of any part of the Work, all such revisions and redesigns, and all new drawings and details required shall be provided by the Contractor and shall be approved by the Resident Engineer. Where the Resident Engineer approves a product proposed by the Contractor and the proposed product results in additional work or added costs, the Contractor proposing the product is solely responsible for such costs and added work.

3.5 Quality, Quantity and Labeling. The Contractor shall furnish materials and equipment of the quality and quantity specified in the Contract. When materials are specified to conform to any standard, the materials delivered to the Site shall bear manufacture’s label stating that the materials meet such standards. These requirements shall not restrict or affect the City’s right to test materials as provided in the Contract.

3.6 Removal and Replacement of Concrete for Deficient Strength

3.6.1 The Contractor recognizes that the concrete mix specified was selected to yield concrete of desired strength and durability and the Contractor agrees that should he fail to supply concrete of the specified strength in the construction, the Contractor shall remove and replace the deficient concrete at the Contractor’s sole expense. The strength of the concrete shall be determined by test cylinders made and tested in accordance with the Specifications to be paid for by the Contractor.

3.6.2 Before the Contractor begins to manufacture concrete, he shall secure the Resident’s Engineer’s approval of the formula he proposes to use, and he shall certify such formula to the Resident Engineer as yielding concrete of the desired strength, density and workability, but in no case shall the cement be less, or the water/cement ratio more, than that specified. The Contractor shall submit for this purpose a statement in writing of the sources of all ingredient materials, the type and brand of the cement, and the number of pounds of each of the materials in a saturated surface dry condition, making up one (1) cubic yard of concrete. The range of water/cement ratios within which the concrete will be manufactured and the method of mixing to be employed shall also be stated. The formula as finally approved shall not be changed without the written consent of the Resident Engineer.

ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION

4.1 Unless otherwise expressly provided in the Contract Drawings, Specifications, and Addenda, the Means and Methods of Construction shall be such as the Contractor may choose; subject, however, to the Resident Engineer’s right to reject the Means and Methods of Construction proposed by the Contractor

which in his/her opinion: (i) will constitute or create a hazard to the Work, or to persons or property; (ii) will not produce finished Work in accordance with the terms of the Contract; and/or (iii) will be detrimental to the overall progress of the Project.

4.2 The City's approval of the Contractor's Means and Methods of Construction, or his/her failure to exercise his/her right to reject such means or methods, shall not relieve the Contractor of its obligation to complete the Work as provided in this Contract, nor shall the exercise of such right to reject create a cause of action for damages.

ARTICLE 5. CONTRACTORS

5.1 Superintendence by Contractor. The Contractor shall employ a full-time competent construction superintendent and necessary staff. The construction superintendent shall devote full time to the Work and shall have full authority to act for the Contractor at all times. If at any time the superintendent is not satisfactory to the City, the Contractor shall, if requested in writing by the City, replace said superintendent with another superintendent satisfactory to the City.

5.2 Subsurface or Site Conditions Found Different. The Contractor acknowledges that the Contract consideration includes such provisions which the Contractor deems proper for all subsurface or site conditions the Contractor could reasonably anticipate encountering as indicated in the Contract, or borings, reports, rock cores foundation investigation reports, topographical maps or other information available to the Contractor or from the Contractor's inspection and examination of the Site prior to submission of bids. Should the Contractor encounter subsurface or site conditions at the Site materially different from those shown on or described in or indicated in the Contract, the Contractor shall immediately give notice to the Resident Engineer of the differing conditions and shall not disturb the differing conditions until directed to do so by the Resident Engineer.

5.3 Verifying Dimensions. The Contractor shall take all measurements at the Site and shall verify all dimensions at the Site before proceeding with the Work. If said dimensions are found to be in conflict with the Contract, the Contractor immediately shall give notice to the City. The Contractor shall comply with any revised Contract Documents. During the progress of Work, the Contractor shall verify all field measurements prior to fabrication of building components or equipment, and proceed with the fabrication to meet field conditions. The Contractor shall consult all Contract Documents to determine the exact location of all Work and verify spatial relationships of all Work. Any question concerning location or spatial relationships may be submitted to the Resident Engineer. Special locations for equipment, pipelines, ductwork and other such items of Work, where not dimensioned on plans, shall be determined in consultation with the Resident Engineer. The Contractor shall at all times be responsible for the proper fitting of the Work in place.

5.4 Related Work. The Contractor shall examine the Contract for related work to ascertain the relationship of said work to the Work under the Contract.

5.5 Surveys and Layout. Unless otherwise expressly provided in the Contract, the Resident Engineer shall furnish the Contractor with all surveys of the Site necessary for the Work. The Contractor shall be responsible for the layout of the Work.

5.6 Errors, Ambiguities or Discrepancies. The Contractor shall examine the Contract thoroughly before commencing the Work and promptly report any errors, ambiguities or discrepancies to the Resident Engineer. Failure of the Contractor to do so shall result in a waiver of any claim by the Contractor based on such errors, ambiguities or discrepancies.

ARTICLE 6. INSPECTION AND ACCEPTANCE

6.1 Access to Work. During the progress of the Work and up to the date of Final Acceptance, the Contractor shall maintain, at all times afford the City, access to the Work, materials and equipment at the Site.

6.2 Notice of Testing. If the Contract Documents, the City's instructions, Laws, rules, ordinances, or regulations require that any Work be inspected or tested, the Contractor shall give the City timely notice of readiness of the Work for inspection or testing and the date/time for said inspections or testing.

6.3 Reexamination of Work. Reexamination of any part of the Work may be ordered by the City, and if ordered, the Work must be uncovered or taken down by the Contractor. If the exposed Work proves satisfactory, such uncovering or taking down and restoration shall be considered an item of Extra Work to be paid by the City. If the Work exposed proves unsatisfactory, the City has no obligation to compensate the Contractor for the uncovering, taking down or restoration.

6.4 Inspection of Work. Inspection and approval by the City of finished Work, or of Work being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the Contractor of its obligation to perform the Work in strict accordance with the Contract. Finished or unfinished Work not found to be in strict accordance with the Contract shall be replaced as directed by the Resident Engineer, even if such Work may have been previously approved and paid for. Such corrective Work is Contract Work and shall not be deemed Extra Work.

6.5 Testing. All materials and equipment used in the Work shall be subject to inspection and testing in accordance with accepted standards to establish conformance with Specifications and suitability for uses intended, unless otherwise specified in the Contract. If any Work shall be covered or concealed without the approval or consent of the City, that Work shall, if directed by the City, be uncovered for examination. Any inspection by the City or by a testing laboratory on behalf of the City does not relieve the Contractor of the responsibility to maintain quality control of materials, equipment and installation to conform to the requirements of the Contract. If any test results are below accepted standards, the City may order additional testing. The cost of said additional testing, any additional professional services required, and any other expenses incurred by the City as a result of such additional testing, shall be paid by the Contractor.

6.6 Acceptance. No previous inspection shall relieve the Contractor of the obligation to perform the Work in accordance with the Contract. No payment, either partial or full, by the City to the Contractor shall excuse any failure by the Contractor to comply fully with the Contract. The Contractor shall remedy all defects and incur the cost of any damage to other Work resulting therefrom.

6.7 Rejected Work. Any rejected Work and materials shall be promptly taken down and removed from the Site, which must at all times be kept in a reasonably clean and neat condition.

6.8 Manufacturer's Guarantee. The Contractor shall secure from the manufacturers of all equipment and materials required under the Contract such manufacturer's standard warranties and guarantees (or such other warranties and guarantees as the Specifications may require) in the name of the City of New Rochelle and shall deliver the same to the Resident Engineer.

ARTICLE 7. PROTECTION OF WORK AND OF PERSONS AND PROPERTY: NOTICES AND INDEMNIFICATION

7.1 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall be under an absolute obligation to protect the finished and unfinished Work against any damage, loss, injury, theft, and/or vandalism, and in the event of such damage, loss, injury, theft, and/or vandalism, it shall promptly replace and/or repair such Work at the Contractor's sole cost and expense, as directed by the Resident Engineer. The obligation to deliver finished Work in strict accordance with the Contract prior to Final Acceptance shall be absolute and shall not be affected by the Resident Engineer's approval of, or failure to prohibit, the Means and Methods of Construction used by the Contractor.

7.2 During the performance of the Work and up to the date of Final Acceptance, the Contractor shall take all reasonable precautions to protect all persons and property of the City and of others from damage, loss or injury resulting from the Contractor's and/or its Subcontractors' operations under this Contract. The Contractor's obligation to protect shall include the duty to provide, place or replace, and adequately maintain at or about the Site suitable and sufficient protection such as lights, barricades, and enclosures.

7.3 In the event of any loss, damage or injury to Work, persons or property, or any accidents arising out of the operations of the Contractor and/or its Subcontractors under this Contract, the Contractor shall submit a full report in writing to the Resident Engineer within three (3) Days after the occurrence. The Contractor shall also send written notice of any such event to all insurance carriers that issued potentially responsive policies (including commercial general liability insurance carriers for events relating to the Contractor's own employees) no later than twenty (20) Days after such event and again no later than twenty (20) Days after the initiation of any claim and/or action resulting therefrom. For any policy on which the City is an additional insured, such notice shall expressly state that "this notice is being given on behalf of the City of New Rochelle as an additional insured, as well as the Named Insured." Whenever such notice is sent under a policy on which the City is an additional insured, the Contractor shall provide copies of the notice to the Commissioner and the City's Corporation Counsel at the notice address herein. If the Contractor fails to provide any of the foregoing notices to any appropriate insurance carrier(s) in a timely and complete manner, the Contractor shall indemnify the City for all losses, judgments, settlements, and expenses, including reasonable attorneys' fees, arising from an insurer's disclaimer of coverage citing late notice by or on behalf of the City.

7.4 Indemnification. To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold the City, its officials, employees, and agents (the "Indemnitees") harmless against any and all claims (including claims asserted by any employee of the Contractor and/or its Subcontractors) and costs and expenses of whatever kind (including payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the operations of the Contractor and/or its Subcontractors in the performance of this Contract or from the Contractor's and/or its Subcontractors' failure to comply with any of the provisions of this Contract or of the Law. Such costs and expenses shall include all those incurred in defending any underlying claim and those incurred in connection with the enforcement of this

Article by way of cross-claim, third-party claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of Law or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing or contributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of Law, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis. Indemnification under this Article or any other provision of the Contract shall operate whether or not Contractor or its Subcontractors have placed and maintained the insurance specified under Article 22.

7.5 The provisions of this Article 7 shall not be deemed to create any new right of action in favor of third parties against the Contractor or the City.

7.6 Construction Site Emergency. A construction site emergency is as an unforeseen condition or event requiring prompt action by the Contractor. Construction site emergencies include, but are not limited to, construction related accidents, uncontrolled release of asbestos, lead dust or other hazardous materials or contamination, natural disasters, automobile accidents, floods and fire. The Contractor must notify the City of a construction site emergency within a half-hour of the occurrence of the event, in accordance with the following:

- 7.6.1 If the emergency occurs during regular business hours the Contractor must notify the Resident Engineer and call the New Rochelle Police Department at (914) 654-2300.
- 7.6.2 During non-business hours the emergency shall be reported by the Contractor to the New Rochelle Police Department, and shall also be reported to the Resident Engineer at the earliest opportunity.

CHAPTER III: TIME PROVISIONS

ARTICLE 8. COMMENCEMENT AND PROSECUTION OF WORK; TIME FOR COMPLETION; LIQUIDATED DAMAGES

8.1 The Work shall commence as specified in the Notice to Proceed and shall be substantially completed within the time set forth in Schedule "A" to this General Agreement. The date of commencement and time for completion, as specified in the Contract, are essential conditions of the Contract.

8.2 The Contractor shall perform the Work regularly, diligently, and without interruption at such rate of progress as to insure timely completion of same, taking into consideration the average climatic range and usual industrial conditions prevailing at the Site.

8.3 Should the Contractor fail to timely commence or perform any Work, or otherwise fail to carry out any directions consistent with the terms of the Contract after written notice from the City, the City may have such work done or materials furnished by others and deduct the cost thereof from the monies due, or to become due under the Contract.

8.4 Should the Contractor fail to complete the Work within the time specified or any proper extension thereof, the Contractor shall pay to the City, as a partial consideration for the Contract, the amount specified in Schedule A to this General Agreement, not as a penalty, but as liquidated damages for breach of contract, for each and every Day that the Contractor shall be in default.

8.5 The amount of liquidated damages is agreed upon by the Contractor and the City as set forth in Schedule A to this General Agreement because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages which the City would sustain in said event and such amount is agreed to be the amount of damages which the City or its beneficiaries would sustain and said amount shall be retained by the City.

8.6 In the event the Contractor fails to complete the Work within the time fixed for such completion in Schedule A to this General Agreement, plus authorized time extensions, or if the Contractor, in the sole determination of the City, has abandoned the Work, the Contractor shall pay to the City the sum fixed in Schedule A to this General Agreement, for each and every Day that the time consumed in completing the Work exceeds the time allowed therefor.

8.7 Liquidated damages received under this Article 8 are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the City's right to indemnification under Article 7, or the Contractor's obligation to indemnify the City, or to any other remedy provided for in this Contract or by Law. Any failure to assess liquidated damages shall not operate as a waiver or release of any claim the City may have against the Contractor for either actual or liquidated damages.

8.8 The City will deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages, and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference upon demand by the City.

8.9 TIME IS OF THE ESSENCE for each and every portion of the Work. In any instance in which additional time is allowed for completion, the new time of completion established by the relevant change order shall be of the essence. The Contractor shall not be charged with liquidated damages or any excess cost if the Resident Engineer determines in writing that the Contractor is without fault and the Contractor's reason for the time extension is acceptable to the City. Nor shall the Contractor be charged with liquidated damages or any excess cost if the delay in completion is due to an unforeseeable cause beyond the control and without the fault of, or negligence of the Contractor, and approved by the City, including but not limited to acts of God or public enemy, acts of the City, epidemics, quarantine, restrictions, strikes, freight embargoes and unusually severe weather.

8.10 The time for completion can only be extended by change order pursuant to Article 24 and may be extended for all the Work or only that portion of the Work altered by the change order.

8.11 Permitting the Contractor to continue with the Work after the time for its completion has expired, or the making of any payment to the Contractor after such time, shall in no way operate as a waiver on the part of the City of any of its rights under this Contract.

8.12 Application for an Extension of Time

8.12.1 Before a change order for a time extension request may be approved, the Contractor must, within five (5) business days after the commencement of the condition which allegedly has caused or is causing the delay, submit a written application to the Resident Engineer identifying:

- (a) the Contractor and Project description;
- (b) liquidated damage assessment rate as specified in the Contract;
- (c) original bid amount;
- (d) original Contract start date and completion date;
- (e) any previous time extensions granted (number and duration); and
- (f) the extension of time requested.

8.12.2 In addition, the application for an extension of time shall set forth in detail:

- (a) the nature of each alleged cause of delay in completing the Work;
- (b) the date upon which each such cause of delay began and ended and the number of days attributable to each such cause;
- (c) a statement that the Contractor waives all claims except for those delineated in the application, and the particulars of any claims which the Contractor does not agree to waive. For time extensions for Substantial Completion and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and
- (d) a statement indicating the Contractor's understanding that the time extension is granted only for purposes of permitting continuation of Contract performance and payment for Work performed and that the City retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

8.13 Failure of the Contractor to strictly comply with the requirements of Article 8 may, in the discretion of the Resident Engineer, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition or interference.

8.14 Grounds for Extension. If such application is made, the Contractor shall be entitled to an extension of time for delay in completion of the Work caused solely by (i) the acts or omissions of the City, its officials, agents or employees; or (ii) the acts, omissions, or interferences of public/governmental bodies, utilities, or private enterprises; or (iii) supervening conditions entirely beyond the control of either party hereto, including without limitation, acts of God or the public enemy, unusually severe weather, epidemics, quarantine, restrictions, strikes, and freight embargoes, not brought about by any act or omission of the Contractor. In addition, the City may, in its sole discretion, grant the Contractor an extension of time to complete the Work for any other reason, provided the delay is not caused by or the result of any act, fault or omission of the Contractor, or of its Subcontractors or Materialmen.

8.15 The Contractor shall not be entitled to an extension of time if the delay is caused by or the result of any act, fault or omission of the Contractor, or of its Subcontractors or Materialmen.

8.16 If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of its Subcontractors or Materialmen, and would of itself have delayed the Work, no extension of time will be allowed.

8.17 The granting of an application for an extension for causes of delay other than those herein referenced to shall be entirely within the discretion of the Commissioner. The determination made by the Commissioner on an application for an extension of time shall be binding and conclusive on the Contractor.

8.18 Notwithstanding the procedures set forth in this Article, the Resident Engineer may, in his discretion, grant a one-time extension, in writing, not to exceed thirty (30) days.

ARTICLE 9. PROGRESS SCHEDULES

9.1 To enable the Work to be performed in an orderly and expeditious manner, the Contractor, within fifteen (15) Days after the Notice to Proceed, shall submit to the Resident Engineer a proposed progress schedule based on the Critical Path Method in the form of a bar graph or in such other form specified by the Resident Engineer showing:

- 9.1.1 The anticipated time of commencement and completion of each of the various operations to be performed under this Contract; and
- 9.1.2 The sequence and interrelation of each of these operations with the others and with those of other related contracts; and
- 9.1.3 The estimated time required for fabrication or delivery, or both, of all materials and equipment required for the Work, including the anticipated time for obtaining required approvals pursuant to Article 10.

9.2 The proposed schedule shall be revised as directed by the Resident Engineer, until finally approved by the Resident Engineer, and after such approval shall be strictly adhered to by the Contractor. If the Contractor fails to adhere to the approved progress schedule, or to the schedule as revised, it shall promptly adopt such other or additional Means and Methods of Construction, at its sole cost and expense, as will make up for the time lost and will assure completion in accordance with the approved progress schedule. The Contractor will not receive any payments until the proposed progress schedule is submitted.

9.3 To ensure on a continuous basis that the Contractor is pursuing the critical path work activities, the Contractor shall attend weekly progress meetings and any other special meetings as directed by the City at no additional cost to the City, and shall provide the Resident Engineer with a two-week-look-ahead schedule identifying planned weekly work activities. This look-ahead schedule shall be updated every two (2) weeks. Failure to attend scheduled meetings or to submit the look-ahead schedule as indicated may result in the withholding of partial payment estimates.

ARTICLE 10. COORDINATION WITH OTHER CONTRACTORS

10.1 During the progress of the Work, Other Contractors may be engaged in performing other work on this Project. In that event, the Contractor shall coordinate the Work to be done hereunder with the work of such Other Contractors and the Contractor shall fully cooperate with such Other Contractors and carefully fit its own Work to that provided under other contracts as may be directed by the Resident Engineer. The

Contractor shall not commit or permit any act which will interfere with the performance of work by any Other Contractors.

10.2 If the Resident Engineer determines that the Contractor is failing to coordinate its Work with the work of Other Contractors as the Resident Engineer has directed, then the City shall have the right to withhold any payments otherwise due hereunder until the Contractor completely complies with the Resident Engineer's directions.

10.3 The Contractor shall notify the Resident Engineer in writing if any Other Contractor on this Project is failing to coordinate its work with the Work of this Contract. If the Resident Engineer finds such charges to be true, the Resident Engineer shall promptly issue such directions to the Other Contractor as the situation may require. The City shall not, however, be liable for any damages suffered by any Other Contractor's failure to coordinate its work with the Work of this Contract or by reason of the Other Contractor's failure to promptly comply with the directions issued by the Resident Engineer, or by reason of any Other Contractor's default in performance; it being understood that the City does not guarantee the responsibility or continued efficiency of any contractor.

10.4 The Contractor agrees to make no claim against the City for any damages arising out of any directions issued by the Resident Engineer pursuant to this Article (including any failure of any Other Contractor to comply with such directions), or the failure of the Resident Engineer to issue any directions, or the failure of any Other Contractor to coordinate its work, or the default in performance of any Other Contractor.

10.5 To the fullest extent provided by law, the Contractor shall indemnify and hold the City harmless from any and all claims, damages, and costs and expenses to which the City may suffer or incur by reason of the Contractor's failure to comply with the Resident Engineer's directions promptly. Insofar as the facts and law relating to any claim would preclude the City from being completely indemnified by the Contractor, the City shall be partially indemnified by the Contractor.

10.6 Should the Contractor sustain any damage through any act or omission of any Other Contractor having a contract with the City for the performance of work upon the Site or of work which may be necessary to be performed for the proper prosecution of the Work to be performed hereunder, or through any act or omission of a subcontractor of such Other Contractor, the Contractor shall have no claim against the City for such damage.

10.7 Should any Other Contractor having a contract with the City for the performance of Work upon the Site sustain any damage through any act or omission of the Contractor or through any act or omission of any subcontractor of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the City shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and shall indemnify and hold the City harmless from all such claims to the fullest extent permitted by law.

10.8 The City's right to indemnification hereunder shall in no way be diminished, waived or discharged by its recourse to assessment of liquidated damages as provided in this General Agreement, or by the exercise of any other remedy provided for by this Contract or by Law.

ARTICLE 11. NO DAMAGES FOR DELAY

11.1 The Contractor agrees to make no claim for damages for delay in the performance of this Contract occasioned by any act or omission to act of the City or any of its representatives, and agrees that any such claim may be fully compensated for by an extension of time to complete performance of the Work as provided herein.

ARTICLE 12. SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE OF WORK

12.1 The Contractor shall substantially complete the Work within the time fixed in Schedule A of the General Agreement, or within the time such Substantial Completion may be extended. The Work will be deemed to be substantially complete when the following conditions have been met. The City will then issue a Certificate of Substantial Completion.

12.1.1 Inspection. The Resident Engineer has inspected the Work and has made a written determination that it is substantially complete; and

12.1.2 Final Approved Punch List. Following inspection of the Work, the Resident Engineer shall furnish the Contractor with a final punch list, specifying all items of Work to be completed and proposing dates for the completion of each specified item of Work. The Contractor shall then submit in writing to the Resident Engineer within ten (10) Days of the Resident Engineer furnishing the final punch list either acceptance of the dates or proposed alternative dates for the completion of each specified item of Work. If the Contractor neither accepts the dates nor proposes alternative dates within ten (10) Days, the schedule proposed by the Resident Engineer shall be deemed accepted. If the Contractor proposes alternative dates, then, within a reasonable time after receipt the Resident Engineer, in a written notification to the Contractor, shall approve the Contractor's completion dates or, if they are unable to agree, the Commissioner shall establish dates for the completion of each item of Work. The latest completion date specified shall be the date for Final Acceptance of the Work; and

12.2 Date of Substantial Completion. The date of approval of the Final Approved Punch List shall be the date of Substantial Completion.

12.3 The date of approval of the Final Approved Punch List shall be either (a) if the Contractor approves the final punch list and proposed dates for completion furnished by the Resident Engineer, the date of the Contractor's approval; or (b) if the Contractor neither accepts the dates nor proposes alternative dates, ten (10) Days after the Resident Engineer furnishes the Contractor with a final punch list and proposed dates for completion; or (c) if the Contractor proposes alternative dates, the date that the Resident Engineer sends written notification to the Contractor either approving the Contractor's proposed alternative dates or establishing dates for the completion for each item of Work.

12.4 Date of Final Acceptance. The Work will be accepted as final and complete as of the date of the Resident Engineer's inspection if, upon such inspection, the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work (or approvals) remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

12.5 Inspection of the Work by the Resident Engineer for the purpose of Substantial Completion or Final Acceptance shall be made within fourteen (14) Days after receipt of the Contractor's written request. If upon such inspection the Resident Engineer determines that there are items of Work still to be performed, the Contractor shall promptly perform them and then request a re-inspection. If upon re-inspection the Resident Engineer determines that the Work is substantially complete or finally accepted, the date of such re-inspection shall be the date of Substantial Completion or Final Acceptance. Re-inspection by the Resident Engineer shall be made within ten (10) Days after receipt of the Contractor's written request. If the Contractor does not request inspection or re-inspection of the Work for the purpose of Substantial Completion or Final Acceptance, the Resident Engineer may initiate such inspection or re-inspection.

ARTICLE 13. OCCUPATION OR USE PRIOR TO COMPLETION

13.1 Unless otherwise provided for in the Specifications, the City may take over, use, occupy or operate any part of the Work at any time prior to Final Acceptance, upon written notification to the Contractor. The Resident Engineer shall inspect the part of the Work to be taken over, used, occupied, or operated, and will furnish the Contractor with a written statement of the Work, if any, which remains to be performed on such part. The Contractor shall not object to nor interfere with the City's decision to exercise the rights granted by this Article. In the event the City takes over, uses, occupies, or operates any part of the Work: (i) the Resident Engineer shall issue a written determination of Substantial Completion with respect to such part of the Work; (ii) the Contractor shall be relieved of its absolute obligation to protect such part of the unfinished Work; (iii) the Contractor's guarantee on such part of the Work shall begin on the date of such use by the City; and; (iv) the Contractor shall be entitled to a return of so much of the amount retained in accordance with Article 20 as it relates to such part of the Work, except so much thereof as may be retained under Articles 21 and 36.

CHAPTER IV: SUBCONTRACTS AND ASSIGNMENTS

ARTICLE 14. SUBCONTRACTS

14.1 No Work may be performed by a Subcontractor prior to the Contractor entering into a written subcontract with the Subcontractor and complying with the provisions of this Article.

14.2 The Contractor shall not make subcontracts totaling an amount more than the percentage of the total Contract price fixed in Schedule A of the General Agreement, without prior written consent from the Commissioner.

14.3 Before making any subcontracts, the Contractor shall submit a written statement to the Resident Engineer giving the name and address of the proposed Subcontractor, the portion of the Work and materials he is to perform and furnish, the cost of the subcontract, and any other information tending to prove that the proposed Subcontractor has the necessary facilities, skill, integrity, past experience and financial resources to perform the Work in accordance with the terms and conditions of this Contract. All Subcontractors must be approved by the City.

14.4 The City will notify the Contractor in writing whether the proposed Subcontractor is approved. If the proposed Subcontractor is not approved, the Contractor may submit another proposed Subcontractor

unless the Contractor decides to do the Work. No Subcontractor shall be permitted to enter or perform any work on the Site unless approved.

14.5 If an approved Subcontractor elects to subcontract any portion of its subcontract, the proposed sub-subcontract shall be submitted in the same manner as directed above.

14.6 The Contractor shall provide each proposed Subcontractor with a complete copy of this document, and each Subcontractor shall expressly stipulate that all labor performed and materials furnished by the Subcontractor shall strictly comply with the requirements of this Contract.

14.7 The City's approval of a Subcontractor shall not relieve the Contractor of any of its responsibilities, duties, and liabilities hereunder. The Contractor shall be solely responsible to the City for the acts or defaults of its Subcontractor and of such Subcontractors sub-contractors, each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

14.8 If the Subcontractor fails to maintain the necessary facilities, skill, integrity, past experience, and financial resources (other than due to the Contractor's failure to make payments where required) to perform the Work in accordance with the terms and conditions of this Contract, the Contractor shall promptly notify the Resident Engineer and replace such Subcontractor with a newly approved Subcontractor in accordance with this Article.

14.9 The Contractor shall be responsible for ensuring that all Subcontractors performing Work at the Site obtain and maintain all insurance required by Law and Article 22 of this Contract during the performance of the Work. The City shall be named as an additional insured on the Subcontractor's insurance.

14.10 The Contractor shall promptly file with the Resident Engineer an executed copy of the subcontract and its cost.

14.11 Every subcontract shall provide expressly that such Subcontract (and all rights of any Subcontractor thereunder) is subject to all requirements of this Contract and that all Work under the subcontract shall comply with all requirements of this Contract. Each Subcontract shall include a provision authorizing termination for necessity or convenience by the Contractor and a provision under which the Subcontractor agrees that the Subcontractor's obligations shall be assigned to the City, at the City's election, upon a termination of the Contractor's rights to perform the Contract. Each subcontract shall contain the same terms and conditions as to the method of payment for Work, and as to retained percentages, as are set forth in the Contract, and the Contractor shall pay each Subcontractor in accordance with the terms of the applicable subcontract for Work performed by the Subcontractor.

14.12 The Commissioner may deduct from the amounts certified under this Contract to be due to the Contractor, the sums due and owing from the Contractor to any Subcontractor according to the terms of the subcontract, and in case of dispute between the Contractor and its Subcontractor(s) as to the amount due and owing, the City may deduct and withhold from the amounts certified under this Contract to be due to the Contractor such sums as may be claimed by such Subcontractor(s), in a sworn affidavit, to be due and owing until such time as such claim(s) shall have been finally resolved.

14.13 The Contractor's execution of any subcontract shall be deemed a representation to the City that the Contractor has informed the Subcontractor fully and completely of all of the requirement of this Article, and has taken all steps necessary to ensure that each and every Subcontractor meets the minimum qualifications required by the City of any contractor submitting bids for any City work.

ARTICLE 15. ASSIGNMENTS

15.1 The Contractor shall not assign, transfer, convey or otherwise dispose of this Contract, or the right to execute it, or the right, title or interest in or to it or any part thereof, or assign, by power of attorney or otherwise any of the monies due or to become due under this Contract, without the prior written consent of the City. The giving of any such consent to a particular assignment shall not dispense with the necessity of such consent to any other assignments.

15.2 Failure to obtain the prior written consent of the City to such an assignment, transfer or conveyance, may result in the revocation and annulment of this Contract. The City shall thereupon be relieved and discharged from any further liability and obligations to the Contractor, its assignees or transferees, and all monies previously earned and unpaid under the Contract shall be forfeited to the City, except so much as may be required to pay the Contractor's employees.

15.3 This Contract may be assigned by the City to any corporation, agency or instrumentality having authority to accept such assignment.

[ARTICLES 16, 17 AND 18 INTENTIONALLY OMITTED]

CHAPTER V: CONTRACTOR'S SECURITY AND GUARANTY

ARTICLE 19. PERFORMANCE SECURITY

19.1 Within ten (10) days after notice of award of the Contract, the Contractor shall furnish an executed performance bond for one hundred (100%) of the Contract price satisfactory to the City.

ARTICLE 20. RETAINED PERCENTAGES

20.1 As further security for the faithful performance of this Contract, the Commissioner shall deduct and retain until Substantial Completion of the Work, five percent (5%) of the value of the Work done and materials furnished for payment in each partial payment voucher.

20.2 Within thirty (30) Days after Substantial Completion of the Work and the filing of a Certificate of Substantial Completion by the Contractor with the Department of Finance signed by the Resident Engineer and Commissioner, all sums retained and remaining shall be released to the Contractor without interest, after deducting from the total value of the Work performed according to the terms of the Contract: (a) two times the value of any remaining items to be completed; (b) an amount the City deems necessary to satisfy any actual or alleged claims, liens or judgments against the Contractor; and (c) all sums the City may retain for periods of maintenance and guarantee as provided in Article 21.

ARTICLE 21. MAINTENANCE AND GUARANTY

21.1 The Contractor shall promptly repair, replace, restore or rebuild, as the Resident Engineer may determine, any finished Work in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the two (2) year period subsequent to the date of final completion of the Work.

21.2 As security for the faithful performance of this Contract, the City shall hold the sum of two percent (2%) of the Contract for a period of two (2) years for materials, parts and labor guarantee. The Contractor shall be responsible for supplying materials, parts and labor for the entire Work until the time of its Final Acceptance by the City, and shall keep every portion of it in perfect order and repair for a period of two (2) years after final completion of the Work, excepting such damages caused by the sole acts of the City, its officials, employees or agents.

21.3 If, after the guarantee period, the City determines that the Contractor has faithfully performed all of its obligations hereunder, the sum without interest shall be released to the Contractor upon demand by the Contractor.

21.4 If the Contractor fails to repair, replace, rebuild or restore such defective or damaged Work promptly after receiving notice, the City shall have the right to have the Work done by others, and to deduct the cost from the amounts deposited hereunder. The balance, if any, shall be released to the Contractor without interest. Should the amount deposited be insufficient to cover such Work, the Contractor shall be liable to pay such deficiency on demand by the City.

21.5 The Resident Engineer's certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective Work when performed by one other than the Contractor, shall be binding and conclusive upon the Contractor as to the amount thereof.

ARTICLE 22. INSURANCE

22.1 At all times during the Contract up to the date of Final Acceptance, the Contractor must secure and maintain the types and limits of insurance set forth in Schedule A to this General Agreement.

ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If an action is commenced and the liability of the Contractor has been established by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the City shall pay such judgment or admitted claim out of the monies retained under Article 20, and return the balance, if any, without interest, to the Contractor.

CHAPTER VI: CHANGES, EXTRA WORK AND DOCUMENTATION OF CLAIM**ARTICLE 24. CONTRACT CHANGES**

24.1 Changes may be made to this Contract only as duly authorized by the Resident Engineer in writing. All such changes, modifications and amendments will become a part of the Contract. Any Work so ordered shall be performed by the Contractor. Contractors deviating from the requirements of the original Contract without a duly approved change order or amendment do so at their own risk.

24.2 Contract changes will be made only as necessary to complete the Work included in the original scope of the Contract and/or for non-material changes to the scope of the Contract. Contract changes may include any contract revision deemed necessary by the City.

24.3 The Contractor shall be entitled to a price adjustment for Extra Work performed pursuant to a written change order. No claim for Extra Work shall be allowed unless the same was done pursuant to a written order by the City.

24.4 The cost of any change order work is subject to verification by audit. If the audit reveals that the Contractor's costs for change order work were inaccurately stated, the City shall recoup the amount by which the costs were inaccurately stated, plus any and all costs incurred by the City to conduct the audit, by proportionately reducing the price of the change order. This remedy is not exclusive and is in addition to all other rights and remedies of the City under this Contract and the Law.

ARTICLE 25. METHODS OF PAYMENT FOR EXTRA WORK

25.1 Overrun of Unit Price Item. An "overrun" is any quantity of a unit price item which the Contractor is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

25.1.1 For any unit price item, the Contractor will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the Work, the actual quantity of any unit price item required to complete the Work approaches the estimated quantity for that item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the Work will exceed the estimated quantity for that item by twenty five (25%) percent, the Contractor shall immediately notify the Resident Engineer of such anticipated overrun. The Contractor shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the Resident Engineer.

25.1.2 If the actual quantity of any unit price item necessary to complete the Work exceeds one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the City and Contractor agree to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the City and

Contractor cannot agree on a new unit price, then the City shall order the Contractor and the Contractor agrees to provide additional quantities of the item on the basis of time and material records for the actual and reasonable cost as determined under Article 25.2, but in no event at a unit price exceeding the unit price bid.

- 25.1.3 The Contractor acknowledges and agrees that the City's estimate of quantities on the various items of work and materials is approximate only, given solely to be used as a uniform basis for the comparison of bids, and is not a part of this Contract. The quantities actually required to complete the Contract Work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the Contractor by reasons thereof.

25.2 Extra Work. Extra Work for which there are applicable Contract unit prices will be paid for at such unit prices subject to the limitations set forth herein. Where there are no applicable Contract unit prices, the price to be paid for Extra Work ordered by the City, and performed by the Contractor's own forces, shall be made on a "Cost Plus" basis as follows:

- 25.2.1 For all necessary direct labor the rates of wages actually paid shall be allowed. No part of the salary of anyone above the grade of foreman and having general supervision of the Work shall be included in the labor item unless the Contractor's job force is entirely occupied with Cost Plus work. In this case the Resident Engineer may, if he deems that the services of the superintendent and/or timekeeper are necessary, allow a part or all of their salaries to be included in the labor item; plus
- 25.2.2 All materials necessary for the Extra work (including transportation to the site; plus
- 25.2.3 All additional payroll insurance and payroll taxes required for the Extra Work; plus
- 25.2.4 All payments required to be made to labor organizations under standard existing labor agreements; plus
- 25.2.5 For maintenance, operation and rental of all power operated equipment necessary for the proper prosecution of the Extra Work on the following basis:
- (a) Rental rates for any power operated machinery, trucks or equipment, which are necessary on Extra Work, shall be negotiated between the Resident Engineer and the Contractor prior to the start of the Extra Work.
 - (b) These rates shall be reasonable and shall be based on local rates and must be agreed upon in writing before the Extra Work is begun. In no case shall the rental rates exceed the rates set up in the current edition of the Associated Equipment Distributors' Compilation of Rental Rates for Construction Equipment, plus the cost of fuel and lubricants.
 - (c) These negotiated rates shall include all repairs, fuel, lubricants, taxes, insurance, depreciation, storage and all attachments complete, ready to operate but excluding operators. Operators shall be paid under subsection 25.2.1 above.
 - (d) In the case of equipment which had previously been brought on the job for regular Contract Work or which is to be used for regular Contract Work after the Extra Work is completed, no allowance will be made for transporting the equipment to or from the site, but if the equipment is used only for the Extra Work, then a fair allowance for transportation shall be made.
 - (e) For equipment which is, or will be, used for regular Contract Work, payment shall be made for only actual time used for the Extra Work, with a minimum of 1/8 day

of an 8-hour day. However, if the equipment is brought in for Extra Work only, then the minimum shall be ½ day.

- (f) If the equipment is used for four (4) days or less, then daily rates shall be used as a basis payment. If the equipment is used more than four (4) days and less than twenty-one (21) days, payment shall be on a weekly rate basis of seven (7) calendar days per week. For periods longer than twenty-one (21) days, monthly rates of thirty-one (31) Days per month shall be used. For fractional periods above the rental period (day, week, or month) payment shall be proportioned on the basis of the applicable rental period.

- (g) No percentage of any kind shall be added to the amounts of equipment rental prices agreed upon and these shall be considered as total compensation for the use of such equipment.

25.2.6 Plus, for necessary installation and dismantling of such equipment (including transportation to and from the site), if any items; plus

25.2.7 Ten percent (10%) of the total of items 25.2.1 through 25.2.6 as compensation for all other items of cost or expense including administration, overhead, general superintendence, and small tools for the Extra Work. However, if any or all of the salaries of the time keeper and/or superintendent are included in the labor payroll then only five percent (5%) of the Extra Work payroll will be allowed; plus

25.2.8 Ten (10%) of the total of items 25.2.1 through 25.2.7 as compensation for profit, except that no percentage for overhead and profit will be allowed on payroll taxes or on the premium portion of overtime pay.

25.3 Where there are no applicable unit prices for Extra Work ordered by the City and performed in whole or in part by other than the Contractor's own forces, the Contractor shall be paid, subject to audit by the City, only the actual and reasonable cost of such subcontracted work computed as outlined above, plus an additional allowance of five percent (5%) to cover the Contractor's profit, superintendence, administration, insurance, and other overhead.

25.4 Where a change is ordered involving both Extra Work and omitted or reduced Contract Work, the Contract price shall be adjusted, subject to audit by the City, in an amount based on the difference between the value of such Extra Work and of the Work omitted or reduced. The cost of such Extra Work and of such omitted or reduced Work shall be computed in accordance with items 25.2.1 through 25.2.6 of this Article. If the cost of such Work exceeds the cost of the Work omitted or reduced, the Contract price shall be increased by the difference, plus ten percent (10%), as compensation for all other items of cost or expense including administration, overhead, general superintendence, and small tools, plus an additional ten percent (10%) of the total as compensation for profit. If the cost of Work omitted or reduced exceed the cost of such Extra Work, then the Contract price shall be reduced by such difference.

25.5 If the Contractor and City agree upon another method of payment for Extra Work, or for Extra Work ordered in connection with omitted or reduced Work, such method may, at the option of the City, be substituted for the Cost Plus method. However, if the Work is performed by a Subcontractor, the Contractor shall not be entitled to receive more than an additional allowance of five (5%) over and above the actual and reasonable cost of such Subcontractor's work.

25.6 The Contractor shall make a record of the Extra Work performed during each day at the close of the day. Both the Resident Engineer and the Contractor, or their authorized representatives, shall sign this record and a copy of the signed record shall be furnished to the Resident Engineer.

25.7 The Contractor shall furnish to the Resident Engineer satisfactory receipts, invoices, certified payrolls and vouchers covering all items of cost relating to the Extra Work and when requested by the City shall give the City access to accounts and records relating thereto. No compensation shall be allowed unless such satisfactory documentation is furnished.

25.8 If the Contractor shall decline, delay or fail to perform such Extra Work or furnish such materials as may be authorized or ordered by the Resident Engineer in writing, then the City, at its discretion, may either withhold the payment of all current estimates until the Contractor's refusal, delay or failure is eliminated or arrange for the performance of the Work or the furnishing of the materials in any manner it sees fit, and the Contractor shall not interfere with the performance of such Work nor shall he make any claim against the City because of such performance.

ARTICLE 26. DISPUTES

26.1 All disputes between the City and Contractor of the kind delineated in this Article shall be finally resolved in accordance with the provisions and procedures set forth below and shall be the exclusive means of resolving any such disputes.

26.2 This Article shall apply only to disputes about the scope of Work delineated by the Contract, the interpretation of Contract documents, the amount to be paid for Extra Work or disputed work performed in connection with the Contract, damages alleged by reason of any act or omission of the City, the conformity of the Contractor's Work to the Contract, and the acceptability and quality of the Contractor's Work. Such disputes arise when the City makes a determination with which the Contractor disagrees.

26.3 During such time as any dispute is being presented, heard, and considered pursuant to this Article, the Contract terms shall remain in force and the Contractor shall continue to perform Work as directed by the City. Failure of the Contractor to continue Work as directed shall constitute a waiver by the Contractor of said claim or dispute.

26.4 Presentation of Disputes to Commissioner. The Contractor shall present its dispute in writing ("Notice of Dispute") to the Commissioner within thirty (30) Days of receiving notice of the action or determination that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the Contract. The Notice of Dispute shall detail all of the facts and include all of the evidence, documents and other basis upon which the Contractor relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the Contractor in dispute was arrived at. Within thirty (30) Days after receipt of the complete Notice of Dispute, the Resident Engineer or other designee of the Commissioner shall submit to the Commissioner all materials he/she deems pertinent to the dispute. Following initial submissions to the Commissioner, either party may demand of the other the production of any documents or materials the demanding party believes is relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise protected by a legal privilege. Any question of relevancy shall be determined by the Commissioner whose decision shall be final. Willful failure of the Contractor to produce any requested material whose relevancy the Contractor

has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the Contractor of the disputed claim.

- 26.4.1 Commissioner's Inquiry. The Commissioner shall examine the material and may, in his discretion, convene an informal conference with the Contractor and Resident Engineer, or other designee of the Commissioner, to resolve the issue prior to reaching a determination. The Commissioner may seek technical or other expertise he deems appropriate, including the use of neutral mediators, and require any such additional materials from either or both parties as he deems fit. The Commissioner's ability to render, and the effect of a decision hereunder shall not be impaired by any negotiations in connection with the dispute presented, whether or not the Commissioner participated therein. The Commissioner may compel the participation of any Other Contractor with a contract related to the Work of this Contract and that contractor shall be bound by the decision of the Commissioner. Any Other Contractor brought into the dispute resolution proceeding shall have the same rights and obligations under this Article as the Contractor.
- 26.4.2 Commissioner Determination. Within thirty (30) Days after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the Commissioner shall make his determination and shall deliver or send a copy of such determination to the Contractor and Resident Engineer, or other designee of the Commissioner, as applicable. All determinations required to be made by the Commissioner under this Article shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented. Failure of the Commissioner to make such determination within the time required by this Article shall be deemed a non-determination without prejudice so as to allow the dispute to proceed directly to arbitration in accordance with this Article.6
- 26.4.3 Finality of Commissioner's Decision. The Commissioner's decision shall be final and binding on all parties, unless presented to binding arbitration pursuant to Article 26.5.

26.5 Presentation of the Dispute to Binding Arbitration. If the claim or any portion of the claim remains in dispute, the Contractor may within thirty (30) Days of its receipt of a decision by the Commissioner, pursue resolution or determination of said dispute by submitting the dispute to the American Arbitration Association ("AAA") under its Construction Industry Arbitration Rules ("AAA Rules"). The decision or award of the arbitrator shall be final and may be entered in any court having jurisdiction. The cost of the arbitration shall be borne equally by City and Contractor.

- 26.5.1 Arbitration Initiation. The arbitration shall be initiated by filing a demand for arbitration in accordance with AAA Rules.
- 26.5.2 Qualifications of the Arbitrator. The arbitrator shall be selected by mutual agreement of the parties. The arbitrator shall be a retired judge or an attorney with at least five (5) years of experience with public works construction contract law and in arbitrating public works construction disputes. In addition, the arbitrator shall have at least twenty (20) hours of formal training in arbitration skills. In the event the parties cannot agree upon a mutually acceptable arbitrator, then the provisions of the AAA Rules shall be followed in selecting an arbitrator possessing these qualifications.
- 26.5.3 Hearing Days and Location. The arbitrator shall set the date, time and place for each hearing, and/or conference. The parties shall respond to requests for hearing dates in a

timely manner, be cooperative in scheduling the earliest practicable date, and adhere to the established hearing schedule. Arbitration hearings shall not be delayed except upon good cause shown.

26.5.4 Recording Hearings. All hearings to receive evidence shall be recorded by a certified stenographic reporter, with the costs borne equally by City and Contractor and allocated by the arbitrator in the final award.

26.5.5 Waiver of Jury Trial. Contractor and City each voluntarily waive the right to a jury trial with respect to any contract dispute that is subject to the provisions of this Article. Contractor shall include this provision for waiver of jury trial in its contracts with its Other Contractors who provide any portion of the Work.

26.6 No claim for Extra Work shall be allowed unless the same was done pursuant to a written order of the City. The Contractor's failure to comply with any parts of this Article 27 shall be deemed to be a conclusive and binding determination on the part of the Contractor that the dispute does not involve Extra Work and is not contrary to the terms and provisions of this Contract, and shall be deemed a waiver by the Contractor of all claims for additional compensation or damages as a result of an order, work, action or omission.

26.7 Any termination, cancellation, or alleged breach of the Contract prior to or during the pendency of any proceedings pursuant to this Article shall not affect or impair the ability of the Commissioner or arbitrator to make a binding and final decision.

ARTICLE 27. RECORD KEEPING FOR EXTRA WORK OR DISPUTED WORK

27.1 While the Contractor or any of its Subcontractors is performing Contract Work, or Extra Work, or where the Contractor believes that it or any of its Subcontractors is performing disputed work or complying with a determination or order under protest, in each such case the Contractor shall furnish the Resident Engineer daily with a written statement signed by the Contractor's representative at the Site showing:

27.1.1 The name, trade, and telephone number of each worker employed on such Work or engaged in complying with such determination or order, the number of hours worked, and the character of the Work each is doing; and

27.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such Work or compliance with such determination or order, and from whom purchased or rented.

27.2 A copy of such statement will be countersigned by the Resident Engineer, noting thereon any items not agreed to or questioned, and will be returned to the Contractor within two (2) business days after submission. The Contractor and its Subcontractors, when required by the City, shall also produce for inspection and copying at the office of the Contractor or Subcontractor any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries, reports, and canceled checks, showing the nature and quantity of the labor, materials, plant and equipment used in the performance of such work or in complying with such determination or order, and the amounts expended therefore.

27.3 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such Work or compliance with such determination or order.

ARTICLE 28. OMITTED WORK

28.1 If any Contract Work in a lump sum Contract, or if any part of a lump sum item in a unit price Contract is omitted by the City, the Contract price shall be reduced by an amount equal to the estimated cost of such omitted Work, computed in accordance with items 25.2.1 through 25.2.6 above, unless the Contractor and City can agree upon another method of fixing the value of such omitted Work. If any Contract Work in a unit price Contract, whether the whole of a lump sum item or units of any other item, is omitted, no payment will be made therefore. The Contractor agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted Work.

ARTICLE 29. NO ESTOPPEL

29.1 Neither the City nor any department, officer, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this Contract by the Commissioner, the Resident Engineer, or any other officer, agent or employee of the City, either before or after the final completion and acceptance of the Work and payment therefor:

- 29.1.1 From showing the true and correct classification, amount, quality or character of the Work actually done, or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the Work or any part thereof, does not in fact conform to the requirements of this Contract; and
- 29.1.2 From recovering from the Contractor any overpayment made to him, or such damages as the City may sustain by reason of the Contractor's failure to perform each and every part of this Contract in strict accordance with its terms, or both.

ARTICLE 30. WAIVER, MODIFICATIONS AND APPROPRIATIONS

30.1 Waiver. Waiver by the City of a breach of any provision of this Contract shall not be deemed to be a waiver of any subsequent breach and shall not be construed to be a modification of terms of the Contract unless the same shall be agreed to in writing by the City.

30.2 Modification. The contract may be modified by the parties in writing in a manner not materially affecting the substance hereof. It may not be altered or modified orally.

30.3 Appropriations. This Contract shall be deemed executory only to the extent of the monies appropriated and available for the purpose of this Contract, and no liability on account thereof shall be incurred by the Contractor beyond the amount of such monies. It is understood that neither this Contract nor any representation by any public employee or officer creates any legal or moral obligation to request, appropriate or make available monies for the purpose of this Contract.

CHAPTER VII: POWERS OF THE RESIDENT ENGINEER AND COMMISSIONER**ARTICLE 31. THE RESIDENT ENGINEER**

31.1 The Resident Engineer shall be the representative of the City at the Site and shall have the power, in the first instance, to inspect the performance of the Work. The Resident Engineer shall give orders and directions contemplated under the Contract relative to the execution of the Work. The Resident Engineer shall have the power to supervise and control the performance of the Work as completed under the Contract.

31.2 The Resident Engineer, in addition to those matters elsewhere herein delegated to the Resident Engineer and expressly made subject to his determination, direction or approval, shall have the power, subject to review by the Commissioner:

- 31.2.1 To determine the amount, quality, and location of the Work to be paid for hereunder.
- 31.2.2 To determine all questions in relation to the Work, to interpret the Contract Drawings, Specifications, and Addenda, and to resolve all patent inconsistencies or ambiguities therein.
- 31.2.3 To determine how the Work of this Contract shall be coordinated with Work of Other Contractors working simultaneously on or adjacent to the Site of the Work, including the power to suspend any part of the Work, but not the whole thereof.
- 31.2.4 To make changes in the Work as he deems necessary, including the issuing of change orders for Extra Work.
- 31.2.5 To amplify the Contract Drawings, add explanatory information and furnish additional Specifications and drawings, consistent with this Contract.
- 31.2.6 To omit Contract Work whenever he deems it is in the best interest of the City to do so.

31.3 The foregoing enumeration shall not imply any limitation upon the power of the Resident Engineer. It is the intent of this Contract that all of the Work shall generally be subject to the Resident Engineer's determination, direction, approval and certification, except where otherwise expressly stated herein.

ARTICLE 32. THE COMMISSIONER

32.1 The Commissioner, in addition to those matters elsewhere herein expressly made subject to his determination, direction or approval, shall have the power:

- 32.1.1 To review and make determinations on any and all questions in relation to this Contract and its performance; and
- 32.1.2 To modify or change this Contract so as to require the performance of Extra Work (subject, however, to the limitations specified in Article 24) or the omission of Contract Work; and
- 32.1.3 To suspend the whole or any part of the Work whenever in his judgment such suspension is required in the interest of the City, or to coordinate the Work of the various contractors engaged on the Site of the Work, or to expedite the completion of the entire Project even though the completion of this Contract may be delayed.

CHAPTER VIII. CONTRACT PRICE AND PAYMENTS**ARTICLE 33. CONTRACT PRICE**

33.1 In full consideration for the Contractor's performance of the Work subject to the terms and conditions hereof, the City shall pay the Contractor the lump sum price or unit prices for which this Contract was awarded, plus the amount required to be paid for any Extra Work ordered by the City under Article 24, less credit for any omitted Work pursuant to Article 28.

ARTICLE 34. PARTIAL PAYMENTS

34.1 The City shall make partial payments to the Contractor on the basis of an approved estimate of the Work performed during the preceding business month. The City shall retain five (5%) of the amount of each estimate in accordance with Article 20 hereof.

34.2 As a condition precedent to payment, the Contractor shall submit a requisition for payment to the Resident Engineer on a monthly basis (except where the Commissioner approves in writing requisitions on a more frequent basis) in a form acceptable to the City, which shall contain an estimate of the quantity and fair value of the Work done during the payment period. The City shall make all monthly partial payments based on the Resident Engineer's review and approval of the requisition for payment. Any partial payment made by the City shall not be construed as acceptance of partially completed Work or as a waiver of the right of the City to require the fulfillment of all of the terms of the Contract.

34.3 Upon receipt of a satisfactory requisition for payment, the Resident Engineer will prepare a voucher for a partial payment in the amount of such approved estimate, less any deductions authorized to be made under the terms of this Contract or by Law. Payment shall be made by the City within thirty (30) Days after receipt, audit and approval of the voucher by the City's Department of Finance.

34.4 With every application for partial payment, the Contractor shall also submit a verified statement in the form prescribed by the City setting forth the information required under Labor Law Section 220-a.

34.5 In preparing estimates for partial payment, material delivered to the Site and properly stored and secured at the Site, material in short or critical supply or material specially fabricated and other material approved to be stored off-Site under such conditions as the Resident Engineer shall prescribe may be taken into consideration. As condition of payment of material stored off-Site, the material shall be properly stored in a secured location approved by the Resident Engineer and must be made available to the City for inspection to assure compliance with Project Specifications. In order to seek payment pursuant to this Article, the Contractor must submit a list of the material in short or critical supply, material specially fabricated for the Work at the Site, or material which for any other reason must be stored off-Site. Such list must be accompanied by a detailed backup substantiating the Contractor's position that it is material in short or critical supply or material specially fabricated for Work at the Site, and such material cannot be installed shortly after delivery and must be stored off-Site. All costs related to the storage of material, or material in short or critical supply or material specially fabricated for the Work at the Site are the sole responsibility of the Contractor. In addition, the Contractor must demonstrate that the materials stored at the Site or off-

Site has been paid for in full by the Contractor, and upon partial payment by the City becomes the sole property of the City.

ARTICLE 35. CONTRACTOR'S PAYMENT TO SUBCONTRACTORS

35.1 The Contractor shall make payment to the Subcontractors within fifteen (15) Days of the receipt of any payment from the City. The Contractor shall pay to each Subcontractor that portion of the proceeds of such payment representing the value of the Work performed by such Subcontractor, based upon the actual value of the subcontract, which has been approved and paid for by the City, less an amount necessary to satisfy any claims, liens, or judgments against such Subcontractor which have not been suitably discharged and less any amount retained by the Contractor as provided herein. The subcontract may provide that the Contractor may retain not more than five percent (5%) of each payment to such Subcontractor, or not more than ten percent (10%) of each such payment if prior to entering into the subcontract such Subcontractor is unable or unwilling to provide a performance bond in the amount of the subcontract. The Contractor agrees it will execute such certificate or statement as the City may require to prove compliance with this Article.

ARTICLE 36. SUBSTANTIAL COMPLETION PAYMENT

36.1 The Contractor shall submit with the Substantial Completion requisition:

36.1.1 A final verified statement of any pending Article 26 disputes and any and all alleged claims against the City in any way connected with or arising out of this Contract, setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included, and the alleged value of each item. With respect to each such claim, the Commissioner and, in the event of litigation, the City Corporation Counsel shall have the same right to inspect and copy the Contractor's books, vouchers, records, etc. Nothing contained in this provision is intended to or shall relieve the Contractor from the obligation of complying strictly with any other provisions of the Contract. The Contractor acknowledges and agrees that unless such claims are completely set forth as herein required, the Contractor upon acceptance of the Substantial Completion payment will have waived any such claims. This provision also applies in all respects to the Final Payment.

36.1.2 Final Approved Punch List.

36.1.3 Where required, a request for an extension of time to achieve Substantial Completion or final extension of time.

36.2 The Resident Engineer shall issue a voucher calling for payment of any part or all of the balance due for Work performed under the Contract, including monies retained under Article 20, less any and all deductions authorized to be made under this Contract or by Law, and less twice the amount the Commissioner considers necessary to ensure the completion of the balance of the Work by the Contractor. Such a payment shall be considered a partial and not a final payment. Payment shall be made by the City within thirty (30) Days after receipt, audit and approval of the voucher by the City's Department of Finance.

36.3 No Substantial Completion payment shall be made where the Contractor failed to complete the Work within the time fixed for such completion in the Schedule A of this General Agreement, or within the

time to which completion may have been extended, until an extension(s) of time for the completion of Work has been acted upon pursuant to Article 8.

36.4 No further partial payments shall be made to the Contractor after Substantial Completion, except payment(s) pursuant to any Contractor's requisition that was properly filed with the City prior to the date of Substantial Completion. The Commissioner may grant a waiver for further partial payments after the date of Substantial Completion to permit payments for change order Work and/or release of retainage and deposits pursuant to Articles 20 and 21. Such waiver shall be in writing.

36.5 The Contractor acknowledges that nothing contained in this Article is intended to or shall in any way diminish the force and effect of any other Articles herein.

ARTICLE 37. FINAL PAYMENT

37.1 As a condition precedent to receiving final payment for all Work, the Contractor shall submit all required certificates, approvals and documents, together with a requisition for the balance claimed to be due under the Contract, less the amount authorized to be retained for maintenance after Final Acceptance.

37.2 The Contractor must submit with the final requisition a final verified statement of any pending Article 26 claims and any and all alleged claims against the City, as required under subsection 36.1.1. The Contractor shall have the same obligations, and the City shall have the same rights, as referenced in Article 36.1.1 as it pertains to submission of a final verified statement. The Contractor agrees that unless such claims are completely set forth as herein required, the Contractor upon acceptance of the final payment will have waived any such claims.

37.3 After receiving the documentation herein required, the City will determine the balance due hereunder other than on account of claims, and will prepare a voucher for final payment in that amount, less any and all deductions authorized to be made by the City under this Contract or by Law. Payment pursuant to the final voucher, less any such authorized deductions, shall constitute final acceptance and final payment, and shall be made by the City within thirty (30) Days after receipt, audit and approval by the City's Department of Finance.

37.4 All prior certificates and vouchers upon which partial payments were made, being merely estimates made to enable the Contractor to prosecute the Work more advantageously, shall be subject to correction in the final voucher, and the certification of the Resident Engineer and approval of the Commissioner shall be conditions precedent to the right of the Contractor to receive any monies hereunder. Such final voucher shall be binding and conclusive upon the Contractor.

ARTICLE 38. ACCEPTANCE OF FINAL PAYMENT

38.1 The acceptance by the Contractor of the final payment shall constitute and operate as a release of the City from any and all claims of, and liability to, the Contractor for anything done or furnished for the Contractor relating to or arising out of this Contract and the Work done, and for any prior act, neglect or default on the part of the City or any of its officials, agents or employees, excepting only a claim against the City for the amounts deducted or retained in accordance with the terms and provisions of this Contract

or by Law, and excepting any claims not otherwise waived or any pending dispute resolution procedures that are contained in the verified statement filed with the Contractor's final requisition.

38.2 The Contractor agrees that the execution by it of a release in connection with the acceptance of the final payment containing language purporting to reserve rights or claims other than those specifically excepted from the operation of this Article, or those for amounts deducted by City, shall not be effective to reserve such rights or claims, notwithstanding anything stated to the contrary to the Contractor either orally or in writing by any official, agent or employee of the City.

38.3 The Contractor, prior to commencing any action for breach of Contract, must serve a detailed and verified statement upon the City's Corporation Counsel not later than forty (40) Days after the acceptance of the final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

ARTICLE 39. LIENS

39.1 Upon receipt of a lien, the City shall send notice to the Contractor stating that a sum of one and one half (1½) times the amount stated to be due in the lien shall be deducted from payments due to the Contractor. This sum shall be withheld until the lien is discharged.

ARTICLE 40. WITHHOLDING OF PAYMENTS

40.1 The City may withhold from the Contractor any part of any payment as may, in the judgment of the Resident Engineer be necessary: (a) to assure payment of just claims of any person supplying labor or materials for Work; (b) to protect the City from loss due to defective Work not remedied to the satisfaction of the City; or (c) to protect the City from loss due to injury to persons or damage to work or property of others caused by the act or neglect of the Contractor or Subcontractors. The City shall have the right to apply any amount so withheld, in such manner as the City may deem proper to satisfy claims or to secure protection. Such application of the money shall be deemed payments for the account of the Contractor.

40.2 The provisions of this Article are solely for the benefit of the City and any action or non-action hereunder by the City shall not give rise to any liability on the part of the City.

CHAPTER IX: LABOR PROVISIONS

ARTICLE 41. EMPLOYEES

41.1 The Contractor and its Subcontractors shall not employ on the Contract Work:

41.1.1 Anyone who is not competent, faithful and skilled in the Work for which he or she shall be employed, and whenever the City shall inform the Contractor that any employee is, in the City's opinion, incompetent, unfaithful, or disobedient, he shall be discharged from the Work forthwith, and shall not again be employed upon it; or

41.1.2 Any labor, materials or means whose employment, or utilization during the course of this Contract, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of Work or similar troubles by workers employed by the Contractor, his

Subcontractors, or by any of the trades working in or about the Site where Work is being performed under this Contract, or by Other Contractors or their subcontractors pursuant to Other Contracts, or on any other premises or buildings owned or operated by the City, its agencies, departments, boards or authorities. Any violation by the Contractor of this requirement may be considered sufficient cause for declaring the Contractor to be in default; or

- 41.1.3 In accordance with Section 220 (3-e) of the Labor Law, the Contractor and his Subcontractors shall not employ on the Work any apprentice unless he is registered individually, under a bona fide program registered with the New York State Department of Labor. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the Contractor as to his work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above shall be paid the wage rate determined by the classification of Work he actually performed. The Contractor or Subcontractor will be required to furnish written evidence of the registration of his program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the Contract Work.

ARTICLE 42. AFFIRMATIVE ACTION POLICIES; EMPLOYER AND PROFESSIONAL RESPONSIBILITIES

42.1 Affirmative Action. The Contractor shall comply with, and assist the City in implementing, all affirmative action policies set forth in the Contract as well as any such policies or regulations which may be issued or amended by the City from time to time, and all requirements under applicable Federal, State and Municipal statutes, and any applicable regulations thereunder, relating to equal employment opportunities for all individuals.

42.2 Employer Responsibilities. The Contractor shall comply with the provisions of all applicable State and Municipal requirements and with all State and Federal laws applicable to the Contractor as an employer of labor or otherwise as well as any labor provisions set forth in this Contract or required by Law.

42.3 Professional Status Requirements. The Contractor shall comply, at its own expense, with all rules, regulations and licensing requirements pertaining to its professional status and that of its employees, partners, associates, Subcontractors and others employed to undertake and complete the Work hereunder.

ARTICLE 43. LABOR LAW PROVISIONS

43.1 The Contractor agrees, as required by Labor Law Sections 220 and 220-d, as amended, that:

43.1.1 No laborer, worker or mechanic in the employ of the Contractor or any Subcontractor employed by the Contractor in the performance of this Contract shall be permitted or required to work more than eight (8) hours in any one (1) Day or more than five (5) Days in any one week except in cases of extraordinary emergency, as defined in the Labor Law.

43.1.2 The wages to be paid for a legal day's work to each laborer, worker or mechanic employed by the Contractor or any Subcontractor in the performance of this Contract shall not be less than the prevailing rate of wages as defined by Law.

- 43.1.3 Each laborer, worker or mechanic employed by the Contractor or any Subcontractor in the performance of this Contract shall be provided the prevailing supplements as defined by Law.
- 43.1.4 The minimum hourly rate of wages to be paid and the minimum supplement to be provided to the laborers, workmen or mechanics employed in the performance of this Contract, either by the Contractor or any Subcontractor, shall not be less than that which shall be designated by the Commissioner of Labor of the State of New York.
- 43.1.5 The Contractor and any Subcontractor shall pay all employees engaged in the performance of this Contract in full, less legally required deductions, in accordance with Labor Law Section 220.3. All such payments shall be made in cash, except payment may be made by check to the extent permitted by Law.
- 43.2 The Contractor agrees that as required by Labor Law Section 220-e, in case of underpayment of wages or supplements to any worker engaged in the performance of this Contract by the Contractor or any Subcontractor, the City may withhold from the Contractor out of payments due any amount sufficient to pay such worker the differences between the wages and supplements required to be paid by the Labor Law and wages and supplements actually paid such worker for the total number of hours worked plus interest as provided in the Labor Law, and that the City may disburse such amount so withheld by the City for and on account of the Contractor to the employees to whom such amount is due. The Contractor further agrees that the amount to be withheld pursuant to this paragraph may be in addition to any other amounts permitted to be retained by the City.
- 43.3 Prevailing Wage Enforcement. The Contractor agrees to pay for the cost of any investigation conducted by or on behalf of the City which discovers a failure to pay prevailing wages by the Contractor or its Subcontractor(s). The Contractor also agrees, that should it fail or refuse to pay for any such investigation, the City is hereby authorized to deduct from the Contractor's account an amount equal to the cost of such investigation.
- 43.4 Daily Sign-Out Log Requirements. Each day of the Contract Work, the Contractor and its Subcontractors shall complete a daily sign-out log acceptable to the City for all their hourly employees performing work on the Project. In addition, the Contractor and its Subcontractors shall insure that all employees listed on the daily log verify the information on the log applicable to them by signing next to their name. The Contractor and its Subcontractors shall deliver the daily sign-out log originals to the Resident Engineer or his representative at a frequency acceptable to the Resident Engineer. However, the Contractor's and its Subcontractors' log submissions must be current before the City will process the Contractor's requisition for payment for any particular period.
- 43.5 Payroll Reports. The Contractor and its Subcontractor(s) shall maintain on the Site during the performance of the Work the original payrolls or transcripts thereof which the Contractor and its Subcontractor(s) are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) Days after issuance of its first payroll, and every thirty (30) Days thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The Contractor and Subcontractor(s) shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the Contractor and its Subcontractor(s) shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment

requisitions. The Contractor shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the Work on this Contract

43.6 Dust Hazards. If during the performance of the Work a harmful dust hazard is created for the elimination of which appliances or methods have been approved by the Industrial Board of Appeals of the State of New York, such appliances and methods shall be installed, maintained and effectively operated by the Contractor in compliance with Labor Law Section 222-a. If Labor Law Section 222-a is not complied with, the City may void this Contract in which event the City shall have the same rights and remedies as it would have in the case of termination under this Contract in addition to any other rights and remedies of the City.

ARTICLE 44. NON-DISCRIMINATION REQUIREMENTS

44.1 In accordance with Chapter 31 of the City Code and Section 220-e of the Labor Law, as amended, Contractor agrees that neither it nor its Subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the Work; or (b) discriminate against or intimidate any employee hired for the performance of Work under this Contract. The Contractor will permit the City to have access to all relevant books, records and accounts for the purposes of investigation to ascertain compliance with such requirements.

44.2 The Contractor understands that in the event of its noncompliance with the nondiscrimination clauses of this Contract or with any such requirements, such noncompliance shall constitute a material breach of this Contract. The Contractor further understands that, as provided in Section 220-e of the Labor Law, as amended, there may be deducted from the amount payable to it by the City under this Contract a penalty of fifty dollars (\$50.00) for each person for each Day during which said person was discriminated against or intimidated by reason of race, creed, color, disability, sex, or national origin in violation of the provisions of this contract. The City may impose any or all of the following sanctions: (a) disapproval of the Contractor; (b) suspension or termination of this Contract; (c) declaring the Contractor in default; or (d) adoption and adherence to an employment program.

44.3 The Contractor understands that, as provided in Section 220-e of the Labor Law, as amended, this Contract may be cancelled or terminated by the City, and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms and conditions of this Contract with regard to discrimination on the basis of race, creed, color, disability, sex or national origin. The City may declare any contractor who has repeatedly failed to comply with Section 220-e of the Labor Law non-responsible.

CHAPTER X. CONTRACTOR'S DEFAULT; TERMINATION

ARTICLE 45. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT

45.1 In addition to those instances specifically referred to in other Articles herein, the Commissioner shall have the right to declare the Contractor in default of this Contract if:

45.1.1 The Contractor becomes insolvent; or

- 45.1.2 The Contractor makes an assignment for the benefit of creditors pursuant to statutes of the State of New York; or
 - 45.1.3 A voluntary or involuntary petition in bankruptcy is filed by or against the Contractor; or
 - 45.1.4 The Contractor fails to commence Work when notified to do so by the City; or
 - 45.1.5 The Contractor abandons the Work; or
 - 45.1.6 The Contractor refuses to proceed with the Work when and as directed by the City;
 - 45.1.7 The Contractor, without just cause, reduces its work force to a number which, if maintained, would be insufficient, in the opinion of the City to complete the Work in accordance with the progress schedule, and fails or refuses to increase sufficiently the work force when ordered to do so by the City; or
 - 45.1.8 The Contractor sublets, assigns, transfers, converts or otherwise disposes of this Contract other than as herein specified; or
 - 45.1.9 The Contractor fails to secure and maintain all required insurance and bonds; or
 - 45.1.10 A receiver is appointed to take charge of the Contractor's property or affairs; or
 - 45.1.11 The City is of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the Work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or
 - 45.1.12 The City is of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Contract; or
 - 45.1.13 The City is of the opinion that the Work cannot be completed within the time herein provided or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the City's opinion, attributable to conditions within the Contractor's control; or
 - 45.1.14 The Work is not completed within the time herein provided or within the time to which the Contractor may be entitled to have such completion extended; or
 - 45.1.15 Any statement or representation of the Contractor in the Contract or in any document submitted by the Contractor with respect to the Work, the Project, or the Contract (or for purposes of securing the Contract) was untrue or incorrect when made; or
 - 45.1.16 The Contractor or any of its officers, directors, partners, shareholders, principals, or other persons substantially involved in its activities, commits any acts subjecting them to disbarment in New York State.
 - 45.1.17 Before declaring the Contractor in default, the Commissioner shall give the Contractor an opportunity to be heard, upon not less than two (2) Days' notice, at which hearing the Contractor may have a stenographer present; provided, however, that a copy of the stenographer's notes and transcript shall be furnished to the City.
- 45.2 The right to declare the Contractor in default for any of the above specified grounds shall be exercised by sending the Contractor a notice, signed by the Commissioner, setting forth the ground(s) upon which such default is declared ("Notice of Default").
- 45.3 The Commissioner's determination that the Contractor is in default shall be conclusive, final, and binding and such a finding shall preclude the Contractor from commencing a plenary action for any damages relating to the Contract. If the Contractor protests the determination of the Commissioner, the

Contractor may commence an action in a court of competent jurisdiction of the state of New York under Article 78 of the New York Civil Practice Law and Rules.

ARTICLE 46. QUITTING THE SITE

46.1 Upon receipt of such Notice of Default, the Contractor shall immediately discontinue all further operations under this Contract and shall immediately quit the Site, leaving untouched all plant, materials, equipment, tools, and supplies then on the Site.

ARTICLE 47. TERMINATION BY THE CITY

47.1 In addition to the right to terminate in the event of a default under Article 45 or any other Article herein, the City may, at any time, terminate this Contract for convenience of the City by written notice to the Contractor and in such event the Contractor shall:

- 47.1.1 Stop Work on the date specified in the notice; and
- 47.1.2 Take such action as may be necessary for the protection and preservation of the City's materials and property; and
- 47.1.3 Cancel all cancellable orders for material and equipment; and
- 47.1.4 Assign to the City and deliver to the Site or another location designated by the Commissioner, any non-cancellable orders for material and equipment that is not capable of use except in the performance of this Contract; and
Take no action which will increase the amounts payable by the City under this Contract.

47.2 On all lump sum contracts, the City will pay the Contractor:

- 47.2.1 Its direct cost as hereinafter defined or the fair and reasonable value, whichever is less, for:
(a) the portion of the Work completed up to the time of termination; and (b) non-cancelable material and equipment that is not capable of use except in the performance of this Contract and has been specifically fabricated for the sole purpose of this Contract but not incorporated in the Work; and
- 47.2.2 Five percent (5%) of the direct cost as hereinafter defined; and
- 47.2.3 In addition to the foregoing, the Contractor shall be paid five percent (5%) of the difference between the lump sum Contract price and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Subsections 47.2.1 and 47.2.2 of this Article.

47.3 On all unit price Contracts, the City will pay the Contractor:

- 47.3.1 For all completed units, the unit price stated in the Contract; and
- 47.3.2 For uncompleted units, payment will be made pursuant to Subsection 47.2.1 and 47.2.2 above.

47.4 Direct costs as used in this Article shall mean:

- 47.4.1 The actual purchase price of material and equipment plus necessary and reasonable delivery costs; and
 - 47.4.2 Actual cost of labor involved in construction and installation at the Site; and
 - 47.4.3 Actual cost of necessary bonds and insurance purchased pursuant to the requirements of this Contract less any amounts that have been or should be refunded by the Contractor's sureties or insurance carriers.
 - 47.4.4 Direct costs shall not include overhead.
- 47.5 In no event shall any payments under this Article exceed the Contract price for such items.
- 47.5.1 All payments pursuant to this Article shall be in the nature of liquidated damages and shall be accepted by the Contractor in full satisfaction of all claims against the City arising out of the termination.
 - 47.5.2 The City may deduct or set off against any sums due and payable pursuant to this Article, any claims it may have against the Contractor.
- 47.6 All payments pursuant to this Article are subject to audit.

ARTICLE 48. COMPLETION OF THE WORK

48.1 The City, after declaring the Contractor in default, may have the Work completed by such means and in such manner, by contract with or without public letting, or otherwise, as he deems advisable, utilizing for such purpose the Contractor's and its Subcontractors' plant, materials, equipment, tools, and supplies remaining on the Site.

48.2 After such completion, the City shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and the total amount of liquidated damages (at the rate provided for in Schedule to this General Agreement) from the date when the Work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the Work. Such certificate shall be binding and conclusive upon the Contractor, its sureties, and any person claiming under the Contract, as to the amount thereof.

48.3 The expense of such completion, including all related and incidental costs, and any liquidated damages shall be charged against and deducted out of such monies earned by the Contractor. The balance of such monies, if any, subject to other provisions of this Contract, shall be paid to the Contractor upon demand without interest upon such completion. Should the expense of such completion exceed the total sum which would have been payable under the Contract if it had been completed by the Contractor, any excess shall be paid by the Contractor to the City upon demand.

ARTICLE 49. PARTIAL DEFAULT

49.1 In case the Commissioner shall declare the Contractor in default as to a part of the Work only, the Contractor shall discontinue such part, shall continue performing the remainder of the Work in strict conformity with the terms of this Contract, and shall in no way hinder or interfere with any Other Contractor(s) or persons whom the Commissioner may engage to complete the Work as to which the Contractor was declared in default.

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

ARTICLE 50. PERFORMANCE OF UNCOMPLETED WORK

50.1 In completing the whole or any part of the Work under the provisions of this Chapter X, the City may depart from or change or vary the terms and provisions of this Contract, provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the City's certificate of the cost of completion referred to in Article 48, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for its default.

ARTICLE 51. OTHER REMEDIES

51.1 In addition to the right to declare the Contractor in default pursuant to this Chapter X, the City shall have the absolute right to complete or cause to be completed in the same manner as described in Articles 48 and 50, any or all unsatisfactory or uncompleted punch list Work that remains after the completion date specified in the Approved Punch List. A written notice of the exercise of this right shall be sent to the Contractor who shall immediately quit the Site in accordance with the provisions of Article 46.

51.2 The expense of completion permitted under this Article shall be charged against and deducted out of monies which have been earned by the Contractor. The balance of such monies, if any, subject to the other provisions of this Contract shall be paid on demand to the Contractor without interest after such completion. Should the expense of such completion exceed the total sum which would have been payable under the Contract if it had been completed by the Contractor, any excess shall be paid by the Contractor to the City upon demand.

51.3 The previous provisions of this Chapter X shall be in addition to any and all other remedies available under Law or in equity. The exercise by the City of any remedy set forth herein shall not be deemed a waiver by the City of any other legal or equitable remedy contained in this Contract or provided under Law.

CHAPTER XI. MISCELLANEOUS PROVISIONS

ARTICLE 52. CITY'S RIGHT TO AUDIT AND INSPECT RECORDS

52.1 The Contractor shall maintain and keep, and require any Subcontractor to maintain and keep, for a period of not less than six (6) years after the date of final acceptance, all books, records, documents, agreements, payments, receipts, logs, ledgers, notes, and all other data of every kind and character without limitation related to the Work (hereinafter referred to as "records"). All such records shall be open to inspection and subject to audit and reproduction by the City or its authorized representative to the extent necessary to adequately permit evaluation and verification of the Contractor's compliance with: (a) the

Contract requirements; (b) the City's business ethics policies set forth herein, and (c) with the provisions for pricing change orders, invoices or claims submitted by the Contractor or any of his payees.

52.2 Such records subject to audit shall also include those records necessary to evaluate and verify direct and indirect costs, including overhead allocations, as they may apply to costs associated with this Contract, and any and all other records and sources of information that may in the City's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract Document. Where Contractor's records have been generated from computerized data, Contractor agrees to provide the City's representatives with copies of data files in suitable computer readable format.

52.3 The City or its designee shall be entitled to audit all of the Contractor's records for a period of six (6) years after final payment or longer if required by Law.

52.4 Contractor shall require all payees to comply with the provisions of this Article by insertion of the requirements hereof in a written contract between Contractor and payee. Requirements to include flow-down audit provisions in contracts with payees applies to, without limitation, Subcontractors, sub-subcontractors and Materialmen. When working under any type of contract, Contractor will cooperate fully and cause all payees to cooperate fully in furnishing or in making available to the City from time to time whenever requested in an expeditious manner any and all such information, materials, and data required by this Article of the Contract.

52.5 The City through its authorized representative(s) shall have access to the Contractor's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of this Contract, shall have access to all necessary records, and shall be provided adequate and appropriate work space to conduct audits in compliance with this Article.

52.6 If an audit inspection or examination in accordance with this Article discloses overpricing or overcharges of any nature by the Contractor to the City in excess of one-half of one percent (.5%) of the total Contract billings, in addition to repayment or credit for the overcharges, the reasonable actual cost of the City's audit shall be fully reimbursed to the City by the Contractor. Any adjustments and/or payments which must be made as a result of any such audit or inspection of the Contractor's invoices and/or records shall be made no later than ninety (90) days from presentation of City's findings to Contractor.

ARTICLE 53. BUSINESS ETHICS

53.1 During the course of pursuing contracts with the City and while performing Work in accordance with this Contract, Contractor agrees to maintain business ethics standards aimed at avoiding any real or apparent impropriety or conflict of interest which could be construed to have an adverse impact on the dealings with the City. Contractor shall take reasonable actions to prevent any actions or conditions which could result in a conflict with the City's best interests. These obligations shall apply to the activities of the Contractor's employees, agents, representatives, Subcontractors, Materialmen, etc. in their dealings and relations with the City's current and former employees and their relatives. The Contractor and its employees, agents, representatives, Subcontractors, Materialmen, etc. shall not make or provide to be made any gifts, entertainment, payments, loans, or other considerations to the City's representatives, employees or their relatives. Contractor agrees to notify the City within forty-eight (48) hours of any instance where the Contractor becomes aware of a failure to comply with the provisions of this Article.

ARTICLE 54. INVESTIGATION CLAUSE

54.1 The Contractor agrees to cooperate fully and faithfully with any investigation, audit or inquiry conducted by the City or by an inspector general or other investigatory authority of a Federal, State, or governmental agency or authority that is empowered to compel the attendance of witnesses and to examine witnesses under oath.

54.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the City, State, or any political subdivision or public authority of New York or other public corporation thereof, or the Port Authority of New York and New Jersey, or any local development corporation within the City, or any public benefit corporation organized under the laws of the State; or,

54.3 If any person refuses to testify for a reason other than the assertion of his/ her privilege against self-incrimination in any investigation, audit or inquiry by any agency empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the City or by an inspector general or other investigatory authority of a State or City governmental agency that is a part of interest in, and is seeking testimony concerning the award of or performance under, any transaction, agreement, lease, permit, contract, or license entered into with the City, the State or other political subdivision or public authority or other public corporation thereof or any local development corporation within the City, or any public benefit corporation organized under the laws of the States, then:

54.3.1 The City may convene a hearing, upon not less than five (5) days' notice to the parties involved, to determine if any penalties should attach for the failure of a person to testify.

54.3.2 If any non-governmental party to such a hearing requests an adjournment, the Contractor agrees for itself and for those acting on its behalf that the City may, upon granting the adjournment, suspend any contract, lease, permit or license pending the final determination pursuant to the provisions below without the City incurring any penalty or damages.

54.4 The Contractor agrees for itself and for those acting on its behalf that the penalties which may be imposed by the City after such a hearing and a final determination by the City may include but shall not exceed:

54.4.1 The disqualification for a period not to exceed five (5) years from the date of such a determination of any person, or any entity of which such a person was a member at the time the testimony was sought, from obtaining any contract, lease, permit or license with or from the City; and/or

54.4.2 The cancellation or termination of any and all existing contracts, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted thereunder, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the City's incurring any penalty or damages on account of such cancellation or termination; monies

lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the City.

54.5 The City shall consider and address in reaching its determination and in assessing an appropriate penalty the factors in subsections 54.5.1 and 54.5.2 below. The City may also consider, if relevant and appropriate, the criteria established in subsection 54.5.3 and 54.5.4 below in addition to any other information which may be relevant and appropriate:

- 54.5.1 The parties' good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought;
- 54.5.2 The relationship of the person who refused to testify to any entity that is a party to the hearing, including, but not limited to whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility the person has within the entity;
- 54.5.3 The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses; and
- 54.5.4 The effect a penalty may have on an unaffiliated and unrelated party or entity that has a significant interest in any entity subject to penalties under paragraph D above, provided that the party or entity has given actual notice to the City upon the acquisition of the interest, or at the hearing called for in Article 54.5 above gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity must present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

54.6 Definitions.

- 54.6.1 The term "license" or "permit" as used herein shall be defined as a license, permit, franchise or concession not granted as a matter of right.
- 54.6.2 The term "person" as used herein shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.
- 54.6.3 The term "entity" as used herein shall be defined as any firm, partnership, corporation, association, or person that receives monies, benefits, licenses, leases or permit from or through the City or otherwise transacts business with the City.
- 54.6.4 The term "member" as used herein shall be defined as any person associated with another person or entity as a partner, director, officer, owner, other principal or employee.

54.7 The City in its sole discretion may terminate this Contract upon not less than three (3) days' notice in the event the Contractor fails to promptly report in writing to the City's Police Commissioner any solicitation for money, goods, future employment or other benefit or thing of value by or on behalf of any employee of the City or any other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this Contract by the Contractor, or affecting the performance of this Contract.

ARTICLE 55. CONTRACTOR'S WARRANTIES

55.1 In consideration of, and to induce the award of this Contract to it, the Contractor represents and warrants:

- 55.1.1 That it is financially solvent, and sufficiently experienced and competent to perform the Work; and
- 55.1.2 That the facts stated in its bid and the information provided by it in the Information for Bidders is true and correct in all respects; and
- 55.1.3 That its principals have read and complied with all the requirements set forth in the Information for Bidders; and
- 55.1.4 That neither it nor any directors, officers, members, partners or employees, has any interest nor shall they acquire any interest, directly or indirectly which would or may conflict in any manner or degree with the performance or rendering of the Work herein provided; and
- 55.1.5 That the Contractor is familiar with all Federal, State, and Municipal laws, ordinances, orders, rules and regulations, which may in any way affect the Work; and
- 55.1.6 That the Contractor has carefully examined the Contract and the Site of the Work and that, from the Contractor's own investigations is satisfied as to the nature and location of the Work, the character quality and quantity of surface and subsurface materials and interferences likely to be encountered, the character or equipment and other facilities needed to perform the Work, the general and local conditions, and all other materials or items which may affect the Work; and
- 55.1.7 That the Contractor is an independent contractor and not an employee of the City. Unless the Contract specifically provides otherwise, the Means and Methods of Construction, control of the Site, and protection of Contractor's employees shall be entirely the Contractor's responsibility at all times.
- 55.1.8 That it has read and complied with all requirements set forth in the Contract.

ARTICLE 56. CONTRACTOR PERFORMANCE EVALUATION AND CRITERIA

56.1 The Resident Engineer will evaluate the Contractor's performance for compliance with Contract requirements. The Contractor will be evaluated by the Resident Engineer at least once during performance of the Contract ("interim evaluation"). In addition, the Contractor will receive a final evaluation near the completion of the Project. The Contractor's overall performance will be rated by the Resident Engineer as either outstanding, very good, satisfactory, marginal or unsatisfactory.

56.2. The Contractor's performance will be evaluated by the Resident Engineer on the basis of: (a) Quality of Work; (b) Management; (c) Scheduling, and (d) Adherence to safety, industrial and hygiene requirements.

56.3 A marginal or unsatisfactory evaluation in any of the elements of the criteria set forth in 56.2 of this Article may serve as a basis for a Contractor to receive an overall rating of marginal or unsatisfactory.

56.4 If the Contractor receives an overall evaluation of either marginal or unsatisfactory, he will be given an opportunity to cure any deficiencies or irregularities in the performance.

56.5 If the Contractor receives an overall interim evaluation of marginal, the Contractor may be suspended from bidding or subcontracting on future City projects for a period of thirty (30) to sixty (60) days. If the Contractor's interim evaluation is unsatisfactory, the Contractor may be suspended from bidding or subcontracting on future City projects for a period of (30) to ninety (90) days.

56.6 If the City determines that the Contractor has failed to provide a cure for the deficiencies or irregularities that resulted in either a marginal or an unsatisfactory interim evaluation, or if the Contractor on a subsequent interim evaluation is rated less than satisfactory, the Contractor may be disqualified from bidding or subcontracting for the remaining term of the Contract.

56.7 If the Contractor receives an overall marginal final evaluation, he may be disqualified from bidding or subcontracting on future City projects for one (1) year. If the Contractor that receives an unsatisfactory rating, he may be disqualified from bidding, contracting or subcontracting on City projects for a period of up to five (5) years.

56.8 If the Contractor is disqualified pursuant to a marginal or unsatisfactory evaluation, the Contractor may appeal the evaluation to the Commissioner.

ARTICLE 57. CLAIMS AND ACTIONS

57.1 Any claims against the City for damages for breach of Contract shall not be made or asserted in any action unless the Contractor has strictly complied with all requirements relating to the giving of notice and of information with respect to such claims as have been herein provided.

57.2 Nor shall any such action or proceeding be instituted or maintained on any such claims unless such action or proceeding is commenced within one (1) year after the date of submission of the final payment voucher pursuant to Article 37; except that an action or proceeding on a claim for monies deducted, retained or withheld under the provisions of this Contract or the Law must be commenced within one (1) year after the date of final payment hereunder or after such monies become due and payable hereunder, whichever is later, and further except that an action or proceeding on a claim based upon the City's exercise of the right to declare the Contractor in default must be commenced within six (6) months after the date the City declared the Contractor in default.

57.3 In the event any claim is made or any action brought in any way relating to the Contract, the Contractor shall diligently render to the City, without additional compensation, any and all assistance which the City may require of the Contractor.

ARTICLE 58. NO CLAIM AGAINST OFFICIALS, OFFICERS., AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the Contractor against any official, officer, agent, or employee of the City for, or on account of, anything done or omitted to be done in connection with this Contract.

ARTICLE 59. INFRINGEMENTS

59.1 The Contractor shall be solely responsible for and shall defend, indemnify, and hold the City harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the City may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the Contractor of any copyright, trade secrets, trademark or patent rights, or any other property or personal right of any third party by the Contractor and/or its Subcontractors in the performance or completion of the Work. Insofar as the facts or Law relating to any claim would preclude the City from being completely indemnified by the Contractor, the City shall be partially indemnified by the Contractor to the fullest extent permitted by Law.

ARTICLE 60. NOTICES

60.1 The Contractor designates the business address, fax number, and email address specified in its bid, as the place where all notices, directions or other communications to the Contractor may be delivered, or to which they may be mailed. Any notice, direction, or communication from either party to the other shall be in writing and shall be deemed to have been given when: (i) delivered personally upon the Contractor, or, if the Contractor is a corporation, upon any officer thereof; (ii) sent by certified mail, return receipt requested; (iii) delivered by overnight or same day courier service in a properly addressed envelope with confirmation; or (iv) sent by fax or email and acknowledged by the recipient.

60.1 The Contractor's notice address, email address, or fax number may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor, and delivered to the Commissioner.

ARTICLE 61. SEVERABILITY

61.1 If any provision, or part thereof, of this Agreement is judicially declared invalid, void or unenforceable, each and every other provision, or part thereof, nevertheless shall continue in full force and effect, and the unenforceable provision shall be changed or interpreted so as best to accomplish the objectives and the intent of such provision within the limits of applicable Law.

ARTICLE 62. ANTITRUST ASSIGNMENT

62.1 The Contractor hereby assigns, sells and transfers to the City of New Rochelle all right, title and interest in and to any claims and causes of action arising under the antitrust laws of New York State or of the United States relating to the particular goods or services purchases or procured by the City under this Contract.

ARTICLE 63. CHOICE OF LAW

63.1 This Contract shall be construed and enforced in accordance with the laws of the State of New York without regard to conflict of law principles. All claims, actions, proceedings and lawsuits brought in connection with, arising out of, related to or seeking enforcement of this Agreement shall be brought in the State of New York, Westchester County.

ARTICLE 64. TAX EXEMPTION

64.1 The City is exempt from payment of state, local taxes, and sales and compensating use taxes of the State of New York and of cities and counties on all materials and supplies incorporated into completed Work. These taxes are not to be included in bids. This exception does not apply to tools, machinery, equipment or other property leased by or to the Contractor or to supplies and materials which, even though they are consumed, are not incorporated into the completed work, and the Contractor and Subcontractors shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on said leased tools, machinery equipment or other property and upon all said unincorporated supplies and materials.

64.2 The Contractor shall obtain any and all necessary certificates or other documentation from the appropriate governmental agency or agencies, and use said certificates or other documentation as required by Law.

ARTICLE 65. COMPLIANCE WITH LAWS

65.1 At all times during the Contractor's Work on the Project, the Contractor shall comply with all Federal, State and Municipal Laws applicable to this Contract and to the Work to be done hereunder, including but not limited to New Rochelle Noise Control Ordinance, and any regulations issued by the Commissioner or other governmental entity having jurisdiction. The Contractor shall also maintain in full force and effect, and shall require its Subcontractors to maintain, all required licenses, certificates, approvals and permits required for the performance of the Work. The Contractor and its officers, employees, agents and Subcontractors shall comply with all City personnel safety rules and all applicable conditions or requirements of any permit or authorization, order or directive issued by any court or governmental regulatory agency with jurisdiction over the Project. All provisions required by Law to be included herein shall be deemed incorporated herein.

65.2 Water Treatment, Storage, and Disposal Facilities and Transporters. In connection with the Work, the Contractor and any Subcontractor shall use only those waste treatment, storage, and disposal facilities and waste transporters that possess the requisite license, permit or other governmental approval necessary to treat, store, dispose, or transport the waste, materials or hazardous substances.

ARTICLE 66. MERGER CLAUSE

66.1 The written Contract herein, contains all of the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of the Contract shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

ARTICLE 67. CONFLICTS; HEADINGS

67.1 It is understood and agreed by the parties that in the event of an inconsistency or conflict between any part or parts of the Contract Documents, the Resident Engineer shall determine what shall prevail.

67.2 The headings and captions used in the General Agreement are for reference purposes only and shall not have any effect on the interpretation of the Agreement.

SECTION D

EXECUTION OF CONTRACT

IN WITNESS WHEREOF, the parties have caused this General Agreement to be executed by their duly authorized representatives.

City of New Rochelle

By: _____
Kathleen Gil
City Manager

Date: _____

Name of Contractor

Date: _____

Approved as to Form

By: _____
Dawn Warren Esq.
City of New Rochelle Corporation Counsel

By: _____
(Authorized Officer of the Firm or Corporation)

(Print Name and Title)

Where the Contractor is a Corporation, add:
Attest:

(Secretary of the Corporation) (Seal)

Legal Name and Address of Contractor

ACKNOWLEDGEMENT OF THE CITY MANAGER

STATE OF NEW YORK)

COUNTY OF WESTCHESTER) ss.:

CITY OF NEW ROCHELLE)

On this _____ day of _____, 20____, before me personally came _____ to me known, who being by me duly sworn, did depose and say that he/she resides in the City of New Rochelle, N.Y., that he/she is the CITY MANAGER OF THE CITY OF NEW ROCHELLE, the corporation described in and which executed the above instrument; that he/she knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was affixed by order of the Council of said corporation and he/she signed his/her name thereto by like order of the Council of said corporation and he/she signed his/her name thereto by like order.

Notary Public

ACKNOWLEDGEMENT IF THE CONTRACTOR IS AN INDIVIDUAL

STATE OF _____)

) ss.:

COUNTY OF _____)

On this _____ day of _____, 20____, before me personally
came _____, to me known and known to me to be the
person described in and who executed the foregoing contract, and who acknowledged to me the
execution thereof for the purpose therein mentioned.

Notary Public

ACKNOWLEDGEMENT IF CONTRACTOR IS PARTNERSHIP

STATE OF _____)

) ss.:

COUNTY OF _____)

On this _____ day of _____, 20____, before me personally came _____, to me known and known to me to be a member of _____, the firm described in and which executed the foregoing contract, and he/she acknowledged to me that he/she subscribed the name of said firm thereto in behalf of said firm for the purpose therein mentioned.

Notary Public

ACKNOWLEDGEMENT IF CONTRACTOR IS A CORPORATION

STATE OF _____)
COUNTY OF _____) ss.:

On this _____ day of _____, 20____, before me personally
appeared, _____ to me known, who, being by me duly sworn, did
depone and say; that he/she resides in

that he/she is the _____ of _____
the corporation described in and which executed the within instrument; that he/she knows the seal of
said corporation; that the seal affixed to said instrument was such corporate seal; that it was so
affixed by order of the Board of Director of said corporation, and that he/she signed his/her name
thereto by like order.

Notary Public

SECTION E
SAMPLE FORMS OF BONDS
SURETY BOND

(Name of Bonding Company)

(City)

KNOW ALL MEN BY THESE PRESENTS, THAT WE _____

(Name of Contractor)

hereinafter referred to as the Surety, are held and firmly bound unto the CITY OF NEW ROCHELLE, N.Y. in the sum (_____) lawful money of the UNITED STATES OF AMERICA, to be paid to the CITY OF NEW ROCHELLE, N.Y., or to its certain attorneys, successors or assigns; for which payment well and truly to be made, we bind ourselves and our several and respective heirs, executors and administrators, successors, and assigns jointly and severally, firmly by these presents.

Sealed with our seals. Dated this _____ day of _____ in the year two thousand and _____.

WHEREAS, the above bounden Contractor, by an instrument in writing, signed by the Contractor, and bearing even date with these presents, has contracted with THE CITY OF NEW ROCHELLE, N.Y. to perform all the work and furnish all the materials and plants called for in the preceding contract for _____

NOW, THEREFORE, the conditions of the above obligations are such that if the said above bounden Contractor, his or its executive administrators, successors or assigns, shall well and truly, and in good, sufficient and workmanlike manner, perform the work mentioned in the aforesaid agreement, in accordance with the terms and provisions therein stipulated, and in each and every regard comply with the conditions and covenants therein contained then this obligation to be void, otherwise to remain in full force and virtue.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or to the specifications accompanying the same shall in any wise affect its obligation on said bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Attest _____
(Signature)

(Name)

(Title)

(Signature of Contractor)

Attest	_____	_____
	(Signature)	(Name)
	_____	_____
	(Title)	(Signature)

Surety bond to be approved, as to form and correctness, by the Corporation Counsel of the City of New Rochelle

Of Surety

(Qualifications of Surety Company and acknowledgements to be annexed hereto)

ACKNOWLEDGMENT BY SURETY COMPANY

STATE OF _____)
) ss.:
 COUNTY OF _____)

On this _____ day of _____ 20____, before me personally came _____, to me known, who being by me dully sworn, did depose and say that he/she resides in _____ that he/she is the _____ of the _____, the Corporation described in and which executed the within instrument that he/she known 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/she signed his/her name thereto by like order; and that the liabilities of said company do not exceed its assets as ascertained in the manner provided by the Laws of the State of New York, and the said _____ further said that he/she is acquainted with _____ and knows him/her to be the _____ of said company, that the signature of the said _____ subscribed to the within instrument is in the genuine handwriting of _____ the said _____ and was subscribed thereto by like order of the Board of directors, in the presence of him/her, the said _____.

 Notary Public

ACKNOWLEDGEMENT BY PRINCIPAL UNLESS IT BE A CORPORATION

STATE OF _____)
) ss.:
COUNTY OF _____)

On this _____ day of _____ 20____, before me personally came _____ to me known and known to me to be the person described in and who executed the foregoing instrument, and acknowledged that he/she executed the same.

Notary Public

ACKNOWLEDGMENT BY PRINCIPAL, IF A CORPORATION

STATE OF _____)
) ss.:
COUNTY OF _____)

On this _____ day of _____ 20____, before me personally came _____ to me known, who, being by me duly sworn, did depose and say that he/she resides in _____; that he/she is the _____ of _____, the corporation described in and which executed the within instrument; that he/she knows the seal of said corporation; that the seal affixed to said instrument was such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he/she signed his/her name thereto by like order.

Notary Public

SECTION F

PREVAILING WAGE RATES

Prevailing wage rates for this Contract, as provided by the New York State Department of Labor, are included in this section.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

City of New Rochelle

Karin Conca, Principal Clerk
515 North Ave
New Rochelle NY 10801

Schedule Year 2023 through 2024
Date Requested 10/05/2023
PRC# 2023012009

Location 40 Pelham RD
Project ID# 23-012
Project Type new bathrooms, offices

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 2023 through June 2024. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

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

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

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

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

SPEC #5629

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.

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 from 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 12226; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

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

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

Payrolls and Payroll Records

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

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

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

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

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

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

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

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

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

Withholding of Payments

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

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

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

Summary of Notice Posting Requirements

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

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

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

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

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

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to 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 journeyworker's wage rate for the classification of work the employee is actually performing.

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

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employment Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12226 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.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

City of New Rochelle

Karin Conca, Principal Clerk
515 North Ave
New Rochelle NY 10801

Schedule Year 2023 through 2024
Date Requested 10/05/2023
PRC# 2023012009

Location 40 Pelham RD
Project ID# 23-012
Project Type new bathrooms, offices

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 12226

SPEC #5629

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, <https://dol.ny.gov/public-work-and-prevailing-wage>

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

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

Effective June 23, 2020

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

(12.20)

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

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

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

- New York State Department of Labor (DOL),
- The Office of the State 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 12226

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.

SPEC #5629



Required Notice under Article 25-B of the Labor Law

**Attention All Employees, Contractors and Subcontractors:
You are Covered by the Construction Industry Fair Play Act****The law says that you are an employee unless:**

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

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

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

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

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

Penalties for paying workers off the books or improperly treating employees as independent contractors:

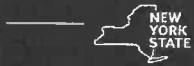
- **Civil Penalty**
 - First offense: Up to \$2,500 per employee
 - Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty**
 - First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 - Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)

SPEC #5629

WE ARE YOUR DOLDepartment
of LaborNew York State Department of Labor
Bureau of Public Work

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.

Your pay stub and wage notice received upon hire must clearly state your wage rate and supplement rate.

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:
<https://dol.ny.gov/bureau-public-work>



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) 568-5287		

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

SPEC #5629

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12226

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

Westchester County General Construction**Boilermaker****10/01/2023****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:	07/01/2023	01/01/2024
Boilermaker	\$ 65.88	\$ 67.38
Repairs & Renovations	65.88	67.38

Repairs & Renovation: Includes Repairing, Renovating replacement of parts to an existing unit(s).

SUPPLEMENTAL BENEFITS

Per Hour:

Boilermaker	33.5% of hourly	33.5% of Hourly
Repair \$ Renovations	Wage Paid	Wage Paid
	+ \$ 26.49	+ \$26.85

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 (*B, O, **U) on OVERTIME PAGE

Note: * Includes 9th & 10th hours, double for 11th or more.

** Labor Day ONLY, if worked.

Repairs & Renovation see (B,E,Q) on OT Page

HOLIDAYPaid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 12, 15, 25, 26, 29) on HOLIDAY PAGE**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:

Apprentice(s)	33.5% of Hourly Wage Paid Plus Amount Below	33.5% of Hourly Wage Paid Plus Amount Below
1st Term	\$ 20.12	\$ 20.36
2nd Term	21.03	21.28
3rd Term	21.95	22.22
4th Term	22.83	23.12
5th Term	23.76	24.07
6th Term	24.67	25.00
7th Term	25.58	25.93

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

Carpenter**10/01/2023****JOB DESCRIPTION** Carpenter**DISTRICT 8****ENTIRE COUNTIES**

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

WAGES

Per hour: 07/01/2023

Piledriver \$ 59.16
+ 9.79*

Dockbuilder \$ 59.16
+ 9.79*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 45.34

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
\$25.60	\$31.20	\$39.58	\$47.97
+ 5.30*	+ 5.30*	+ 5.30*	+ 5.30*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All Terms: \$ 31.83

8-1556 Db

Carpenter

10/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

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

WAGES

Per hour: 07/01/2023

Carpet/Resilient

Floor Coverer \$ 55.05
+ 8.25*

*This portion is not subject to overtime premiums

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

SUPPLEMENTAL BENEFITS

Per hour:

\$ 39.45

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
\$ 25.20	\$ 28.20	\$ 32.45	\$ 40.33

+ 1.85* + 2.35* + 2.85* + 3.85*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 15.22	\$ 16.22	\$ 19.32	\$ 20.32

8-2287

Carpenter**10/01/2023****JOB DESCRIPTION** Carpenter**DISTRICT 8****ENTIRE COUNTIES**

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

WAGES

Per Hour: 07/01/2023

Marine Construction:

Marine Diver	\$ 74.03
	+ 9.79*

Marine Tender	\$ 53.57
	+ 9.79*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker	\$ 45.34
---------------	----------

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	\$ 25.60
	+ 5.30*
2nd year	31.20
	+ 5.30*
3rd year	39.58
	+ 5.30*
4th year	47.97
	+ 5.05*

*This portion is not subject to overtime premiums

Supplemental Benefits

Per Hour:

All terms	\$ 31.83
-----------	----------

8-1456MC

Carpenter**10/01/2023****JOB DESCRIPTION** Carpenter**DISTRICT 8****ENTIRE COUNTIES**

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

WAGES

Per hour: 07/01/2023

Building
Millwright \$ 58.70
+ 12.62*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 44.31

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.
\$31.74	\$37.19	\$42.64	\$53.54
+ 6.75*	+ 7.92*	+ 9.09*	+ 11.43*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$29.81	\$32.34	\$35.52	\$39.94

8-740.1

Carpenter

10/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

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

WAGES

Per Hour:

07/01/2023

Timberman \$ 54.05
+ 10.26*

*This portion not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2023

\$ 44.55

OVERTIME PAY

See (B, E, E2, Q) 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:

One (1) year terms:

1st	2nd	3rd	4th
\$23.42	\$28.53	\$36.18	\$43.84
+ 5.55*	+ 5.55*	+ 5.55*	+ 5.55*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All terms \$ 31.54

8-1556 Tm

Carpenter**10/01/2023****JOB DESCRIPTION** Carpenter**DISTRICT 8****ENTIRE COUNTIES**

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

PARTIAL COUNTIES

Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.

Putnam: South of but including the following, Cold Spring, Tompkins Corner, Mahopac, Croton Falls, east to Connecticut border.

Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

WAGES

Per hour: 07/01/2023

Core Drilling:

Driller

\$ 43.88

+ 2.50*

Driller Helper

\$ 34.47

+ 2.50*

Note: Hazardous Waste Pay Differential:

For Level C, an additional 15% above wage rate per hour

For Level B, an additional 15% above wage rate per hour

For Level A, an additional 15% above wage rate per hour

Note: When required to work on water: an additional \$ 3.00 per hour.

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Driller and Helper

\$ 28.85

OVERTIME PAY

See (B, G, P) on OVERTIME PAGE

HOLIDAY

Paid:

See (5, 6) on HOLIDAY PAGE

Overtime:

See (5, 6) on HOLIDAY PAGE

8-1536-CoreDriller

Carpenter - Building / Heavy&Highway**10/01/2023****JOB DESCRIPTION** Carpenter - Building / Heavy&Highway**DISTRICT 11****ENTIRE COUNTIES**

Putnam, Rockland, Westchester

WAGES

WAGES:(per hour)

Applies to CAPRENTER BUILDING/HEAVY & HIGHWAY/TUNNEL:

	07/01/2023	07/01/2024	07/01/2025	07/01/2026
		Additional	Additional	Additional
Base Wage	\$ 39.80	\$ 1.25**	\$ 1.25**	\$ 1.25**
	+\$6.71*			

*For all hours paid straight or premium.

**To be allocated at a later date.

SHIFT DIFFERENTIAL: When it is mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 33.22

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

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

Overtime: See (5, 6) on HOLIDAY PAGE

- Holidays that fall on Sunday will be observed Monday

- Must be employed during the five (5) work days immediately preceding a holiday or during the five (5) work days following the paid holiday to receive holiday pay

- If Employee is entitled to a paid holiday, the Employee is paid the Holiday wage and supplemental benefits whether they work or not. If Employee works the Holiday, the Employee will receive holiday pay (including supplemental benefits), plus the applicable premium wage for working the Holiday. If Employee works in excess of 8 hours on Holiday, then benefits will be paid for any hours in excess of 8 hours.

REGISTERED APPRENTICES

1 year terms at the following wage rates:

1st	2nd	3rd	4th	5th
\$ 19.90	\$ 23.88	\$ 25.87	\$ 27.86	\$ 31.84
+3.58*	+3.58*	+3.58*	+3.58*	+3.58*

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.27

11-279.1B/HH

Electrician**10/01/2023****JOB DESCRIPTION** Electrician**DISTRICT 9****ENTIRE COUNTIES**

Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour: 07/01/2023 03/07/2024

Service Technician \$ 36.40 \$ 37.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$ 21.07 \$ 21.85

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician**10/01/2023****JOB DESCRIPTION** Electrician**DISTRICT 8****ENTIRE COUNTIES**

Westchester

WAGES

Per hour: 07/01/2023 04/18/2024 04/17/2025

*Electrician/A-Technician \$ 55.75 \$ 56.75 \$ 58.75

Teledata	55.75	56.75	58.75
----------	-------	-------	-------

*All new installations of wiring, conduit, junction boxes and light fixtures for projects with a base bid of more than \$325,000. For projects with a base bid of \$325,000 or less, see Maintenance and Repair rates.

Note: On a job where employees are required to work on bridges over navigable waters, transmission towers, light poles, bosun chairs, swinging scaffolds, etc. 40 feet or more above the water or ground or under compressed air, or tunnel projects under construction or where assisted breathing apparatus is required, they will be paid at the rate of time and one-half for such work except on normal pole line or building construction work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 56.26	\$59.39	\$61.09
---------------	----------	---------	---------

OVERTIME PAY

See (A, G, *J, P) on OVERTIME PAGE

*NOTE: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

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

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

	07/01/2023	04/18/2024	04/17/2025
1st term	\$ 16.00	\$16.00	\$16.00
2nd term	17.00	17.00	17.00
3rd term	19.00	19.00	19.00
4th term	21.00	21.00	21.00
MIJ 1-12 months	26.50	26.50	26.50
MIJ 13-18 months	30.00	30.00	30.00

Supplemental Benefits per hour:

	07/01/2023	04/18/2024	04/17/2025
1st term	\$ 11.63	\$ 12.40	\$ 12.72
2nd term	14.30	15.07	15.89
3rd term	15.62	16.40	17.23
4th term	16.95	17.73	18.57
MIJ 1-12 months	13.92	15.72	15.89
MIJ 13-18 months	14.33	16.17	16.29

8-3/W

Electrician**10/01/2023****JOB DESCRIPTION** Electrician**DISTRICT 8****ENTIRE COUNTIES**

Westchester

WAGES

Per hour

	07/01/2023	04/18/2024	04/17/2025
Electrician -M	\$ 30.00	\$ 30.00	\$ 30.00
H - Telephone	30.00	30.00	30.00

All work with a base bid amount of \$325,000 or less. Including repairs and /or replacement of defective electrical and teledata equipment, all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls, and washing and cleaning of foregoing fixtures.

*If the project exceeds \$375,000 due to changes in the scope of work, an Electrician/A Technician must be part of the labor ratio.

SUPPLEMENTAL BENEFITS

	07/01/2023	04/18/2024	04/17/2025
Electrician & H - Telephone	\$ 14.33	\$ 16.17	\$ 16.29

OVERTIME PAY

See (B, G, *J, P) on OVERTIME PAGE

*Note: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

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

Elevator Constructor**10/01/2023****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:

07/01/2023

Elevator Constructor \$ 77.49

Modernization &
Service/Repair \$ 60.89

NOTE - The 'Employer Registration' (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per Hour:

Elevator Constructor \$ 45.574

Modernization &
Service/Repairs 44.412**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, 2nd, 3rd Terms are based on Average wage of Constructor & Modernization.

Terms 4 thru 9 Based on Journeyman's wage of classification Working in.

6 MONTH TERMS:

1st Term*	2nd & 3rd Term*	4th & 5th Term	6th & 7th Term	8th & 9th Term
50%	50%	55%	65%	75%

SUPPLEMENTAL BENEFITS**Elevator Constructor**

1st Term	\$ 0.00
2nd & 3rd Term	36.024
4th & 5th Term	36.943
6th & 7th Term	38.448
8th & 9th Term	39.953

**Modernization &
Service/Repair**

1st Term	\$ 0.00
2nd & 3rd Term	35.694
4th & 5th Term	36.525
6th & 7th Term	37.948
8th & 9th Term	39.38

Elevator Constructor**10/01/2023****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	07/01/2023	01/01/2024
Mechanic	\$ 67.35	\$ 70.15
Helper	70% of Mechanic Wage Rate	70% of Mechanic Wage Rate

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour	07/01/2023	01/01/2024
Journeyman/Helper	\$ 37.335*	\$ 37.885*

(*)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 Journeyman/Helper

1-138

Glazier**10/01/2023****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:	7/01/2023
Glazier & Glass Tinting	\$ 61.64
*Scaffolding	65.64
Window Film	
**Repair & Maintenance	30.76

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 30' or more, but not pipe scaffolding.

****Repair & Maintenance-** All repair & maintenance work on a particular building whenever performed, where the total cumulative Repair & Maintenance contract value is under \$184,000.

SUPPLEMENTAL BENEFITS

Per hour: 7/01/2023

Glazier & Glass Tinting \$ 40.20

Window Film
Repair & Maintenance 23.19

OVERTIME PAY

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

For 'Repair & Maintenance' 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'

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:

7/01/2023

1st term	\$ 21.93
2nd term	30.05
3rd term	39.95
4th term	48.97

Supplemental Benefits:

(Per hour)

1st term	\$ 18.25
2nd term	25.97
3rd term	31.27
4th term	34.32

8-1087 (DC9 NYC)

Insulator - Heat & Frost

10/01/2023

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Westchester

WAGES

Per hour: 07/01/2023 06/01/2024

Insulator	\$ 59.25	+ \$ 2.50
-----------	----------	-----------

Discomfort & Additional Training**	62.31	+ \$ 2.50
---------------------------------------	-------	-----------

Fire Stop Work*	31.77	+ \$ 2.50
-----------------	-------	-----------

* 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	\$ 37.35
---------------	----------

Discomfort &
Additional Training 39.39
Fire Stop Work:
Journeyworker 19.03

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
\$ 31.77	\$ 37.26	\$ 42.76	\$ 48.26

Discomfort & Additional Training Apprentices:

1st	2nd	3rd	4th
\$ 33.30	\$ 39.09	\$ 44.90	\$ 50.71

Supplemental Benefits paid per hour:

Insulator Apprentices:

1st term	\$ 19.03
2nd term	22.69
3rd term	26.36
4th term	30.03

Discomfort & Additional Training Apprentices:

1st term	\$ 20.06
2nd term	23.92
3rd term	27.78
4th term	31.66

8-91

Ironworker**10/01/2023****JOB DESCRIPTION** Ironworker**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Per Hour:	07/01/2023	01/01/2024
Stone Derrickmen Rigger	\$ 72.90	Additional + \$ 1.64
Stone Handset Derrickman	70.47	+ \$ 1.11

SUPPLEMENTAL BENEFITS

Per hour:

Stone Derrickmen Rigger	\$ 43.10
Stone Handset Derrickman	42.84

OVERTIME PAY

See (B, D1, *E, Q, **V) on OVERTIME PAGE

*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.

** Benefits same premium as wages on Holidays only

HOLIDAY

Paid: See (18) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE

Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES

Wage per hour:

Stone Derrickmen Rigger:

	1st	2nd	3rd	4th
07/01/2023	\$ 35.90	\$ 51.53	\$ 57.32	\$ 63.11

Supplemental Benefits:

Per hour:

07/01/2023	22.11	32.58	32.58	32.58
------------	-------	-------	-------	-------

Stone Handset:

1/2 year terms at the following hourly wage rate:

	1st	2nd	3rd	4th
07/01/2023	34.56	49.75	55.33	60.90

Supplemental Benefits:

Per hour:

07/01/2023	22.10	32.46	32.46	32.46
------------	-------	-------	-------	-------

9-197D/R

Ironworker**10/01/2023****JOB DESCRIPTION** Ironworker**DISTRICT 4****ENTIRE COUNTIES**

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

WAGES

Per Hour: 07/01/2023

Ornamental	\$ 46.90
Chain Link Fence	46.90
Guide Rail	46.90

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$ 63.04

OVERTIME PAY

See (B, B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

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

REGISTERED APPRENTICES

Apprentices Hired after 9/1/18:

1 year terms

	07/01/2023
1st Term	\$ 21.13
2nd Term	24.77
3rd Term	28.40
4th Term	32.06

Supplemental Benefits per hour:

1st Term	\$ 17.90
2nd Term	19.15
3rd Term	20.41
4th Term	21.67

4-580-Or

Ironworker**10/01/2023****JOB DESCRIPTION** Ironworker**DISTRICT 4****ENTIRE COUNTIES**

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

WAGES

PER HOUR:

	07/01/2023	01/01/2024	07/01/2024
Ironworker:		Additional	Additional
Structural	\$ 57.20	\$ 1.75/Hr.*	\$ 1.75/Hr.*
Bridges			
Machinery			

(*)To be allocated at a later date.

SUPPLEMENTAL BENEFITS

PER HOUR PAID:

Journeyman \$ 87.35

OVERTIME PAY

See (B, B1, Q, *V) on OVERTIME PAGE

*NOTE: Benefits are calculated for every hour paid

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

6 month terms at the following rate:

1st	\$ 29.73
2nd	30.33
3rd - 6th	30.94

Supplemental Benefits

PER HOUR PAID:

All Terms \$ 60.69

4-40/361-Str

Ironworker**10/01/2023****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: 07/01/2023

Reinforcing &
Metal Lathing \$ 56.95"Base" Wage \$ 55.20
plus \$ 1.75

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS

Per hour:

Reinforcing &
Metal Lathing \$ 42.72**OVERTIME PAY**

See (B, E, Q, *X) on OVERTIME PAGE

*Only \$23.50 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half \$ 49.47
Double Time \$ 56.22**HOLIDAY**

Paid: See (1) on HOLIDAY PAGE

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

*Note: Work performed after first 4 Hours.

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

1st term	2nd term	3rd term	4th Term
Wage Per Hour: \$ 22.55	\$ 28.38	\$ 34.68	\$ 37.18
"Base" Wage \$ 21.00 plus \$1.55	\$ 26.80 plus \$1.58	\$ 33.10 plus \$1.58	\$ 35.60 plus \$1.58

"Base" Wage is used to calculate overtime hours ONLY.

SUPPLEMENTAL BENIFITS

Per Hour:

1st term	2nd term	3rd term	4th Term
\$ 18.17	\$ 21.34	\$ 22.00	\$ 22.50

4-46Reinf

Laborer - Building**10/01/2023****JOB DESCRIPTION** Laborer - Building**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

WAGES

Per hour	07/01/2023	05/01/2024
Laborer	\$ 40.05 plus \$5.45**	+ \$ 2.00
Laborer - Asbestos & Hazardous Materials Removal	\$ 44.50*	+ \$ 2.00

* Abatement/Removal of:

- Lead based or lead containing paint on materials to be repainted is classified as Painter.
- Asbestos containing roofs and roofing material is classified as Roofer.

** This portion is not subject to overtime premium.

NOTE: Upgrade/Material condition work plan for work performed during non-outage under a wage formula of 90% wage/100% fringe benefits at nuclear power plants.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2023

Journeyworker \$ 30.50

OVERTIME PAY

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

*Note: For Sundays and Holidays worked benefits are at the same premium as wages.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES**LABORER ONLY**

Hourly terms at the following wage:

Level A 0-1000	Level B 1001-2000	Level C 2001-3000	Level D 3001-4000
\$ 28.08	\$ 31.90	\$ 35.72	\$ 39.54

Supplemental Benefits per hour:

Apprentices
All terms \$ 23.20

Laborer - Heavy&Highway**10/01/2023****JOB DESCRIPTION** Laborer - Heavy&Highway**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

WAGES****PUTNAM: APPLIES TO ALL HEAVY & HIGHWAY WORK EXCLUDING HIGHWAYS, STREETS, AND BRIDGES****

GROUP I: Blaster, Quarry Master, Curbs/Asphalt Screedman, Pipe Jacking and Boring Operations Operator, Qualified Dead Condition Pipe Fuser (B Mechanic)

GROUP II: Burner, Drillers(jumbo, joy, wagon, air track, hydraulic), Drill Operator, Self Contained Rotary Drill, Curbs, Raker, Bar Person, Concrete Finisher.

GROUP III: Pavement Breakers, Jeep Operator, Jack Hammer, Pneumatic Tools (all), Gas Driller, Guniting, Railroad Spike Puller, Pipelayer, Chain Saw, Deck winches on scows, Power Buggy Operator, Power Wheelbarrow Operator, Bar Person Helper, Compressed Airline, Water Jet Lance.

GROUP IV: Concrete Laborers, Asph. Worker, Rock Scaler, Vibrator Oper., Bit Grinder, Air Tamper, Pumps, Epoxy (adhesives, fillers and troweled on), Barco Rammer, Concrete Grinder, Crack Router Operator, Guide Rail-digging holes and placing concrete and demolition when not to be replaced, distribution of materials and tightening of bolts.

GROUP V: Drillers Helpers, Common Laborer, Mason Tenders, Signal Person, Pit Person, Truck Spotter, Powder Person, Landscape/Nursery Person, Dump Person, Temp. Heat.

GROUP VIA: Asbestos/Toxic Waste Laborer-All removal (Roads, Tunnels, Landfills, etc.) Confined space laborer, Bio-remediation, Phyto-remediation, Lead or Hazardous material, Abatement Laborer.

Wages:(per hour) 07/01/2023

GROUP I	\$ 49.55*
GROUP II	48.20*
GROUP III	47.80*
GROUP IV	47.45*
GROUP V	47.10*
GROUP VIA	49.10*
Operator Qualified	
Gas Mechanic(A Mech)	59.55*
Flagperson	40.75*

*NOTE: To calculate overtime premiums, deduct \$0.10 from above wages

SHIFT WORK: A shift premium will be paid on Public Work contracts for off-shift or irregular shift work when mandated by the NYS D.O.T. or other Governmental Agency contracts. Employees shall receive an additional 15% per hour above current rate for all regular and irregular shift work. Premium pay shall be calculated using the 15% per hour differential as base rate.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

First 40 Hours

Per Hour

\$ 26.60

Over 40 Hours

Per Hour

19.85

OVERTIME PAY

See (B, E, P, R, S) on OVERTIME PAGE

HOLIDAY

Paid:

See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime:

See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

NOTE:

For Holiday Overtime: 5, 6 - Code 'S' applies

For Holiday Overtime: 8, 15, 25, 26 - Code 'R' applies

REGISTERED APPRENTICES

	1st term	2nd term	3rd term	4th term
	1-1000hrs	1001-2000hrs	2001-3000hrs	3001-4000hrs
07/01/2023	\$ 27.46	\$ 32.41	\$ 37.12	\$ 41.83

Supplemental Benefits per hour:

1st term	\$ 3.85 - After 40 hours: \$ 3.60
2nd term	\$ 3.95 - After 40 hours: 3.60
3rd term	\$ 4.45 - After 40 hours: 4.00
4th term	\$ 5.00 - After 40 hours: 4.50

8-60H/H

Laborer - Tunnel**10/01/2023****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)

	07/01/2023	06/01/2024	06/01/2025
Class 1	\$ 55.55	\$ 57.05	\$ 58.55
Class 2	57.70	59.20	60.70
Class 4	64.10	65.60	67.10
Class 5	47.65	49.90	51.40

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	\$ 35.73	\$ 36.98	\$ 38.23
Benefit 2	51.01	TBD	TBD
Benefit 3	71.28	TBD	TBD

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**10/01/2023****JOB DESCRIPTION** Lineman Electrician**DISTRICT** 6**ENTIRE COUNTIES**

Westchester

WAGES

A 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, assembly of all electrical materials, conduit, pipe 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.

A 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.

Below rates apply to electrical overhead and underground distribution and maintenance work and overhead and underground transmission line work, electrical substations, switching structures, continuous pipe-type underground fluid or gas filled transmission conduit and cable installations, maintenance jobs or projects, railroad catenary installations and maintenance, third rail installations, the bonding of rails and the installation of fiber optic cable. (Ref #14.04.01)

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines. Also includes digging of holes for poles, anchors, footer, and foundations for electrical equipment.

Per hour:	07/01/2023	05/06/2024
Lineman, Tech, Welder	\$ 60.41	\$ 61.91
Crane, Crawler Backhoe	60.41	61.91
Cable Splicer-Pipe Type	66.45	68.10
Digging Mach Operator	54.37	55.72
Cert. Welder-Pipe Type	63.43	65.01
Tractor Trailer Driver	51.35	52.62
Groundman, Truck Driver	48.33	49.53
Equipment Mechanic	48.33	49.53
Flagman	36.25	37.15

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%

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	07/01/2023	05/06/2024
Lineman, Technician, or Equipment Operators with Crane License	\$ 29.40 *plus 7% of the hourly wage paid	\$ 30.90 *plus 7% of the hourly wage paid
All other Journeyman	\$ 26.40 *plus 7% of the hourly wage paid	\$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for 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:

07/01/2023	05/06/2024
\$ 26.40	\$ 26.90
*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWest

Lineman Electrician - Teledata**10/01/2023****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).

	07/01/2023	01/01/2024	01/01/2025
Cable Splicer	\$ 37.73	\$ 39.24	\$ 40.81
Installer, Repairman	\$ 35.81	\$ 37.24	\$ 38.73
Teledata Lineman	\$ 35.81	\$ 37.24	\$ 38.73
Tech., Equip. Operator	\$ 35.81	\$ 37.24	\$ 38.73
Groundman	\$ 18.98	\$ 19.74	\$ 20.53

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:	07/01/2023	01/01/2024	01/01/2025
Journeyman	\$ 5.70	\$ 5.70	\$ 5.70
	*plus 3% of the hourly wage paid	*plus 3% of the hourly wage paid	*plus 3% of the hourly 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.

HOLIDAYPaid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting**10/01/2023****JOB DESCRIPTION** Lineman Electrician - Traffic Signal, Lighting**DISTRICT 6****ENTIRE COUNTIES**

Westchester

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 #14.01.03)

Per hour:	07/01/2023	05/06/2024
Lineman, Technician	\$ 54.73	\$ 55.95
Crane, Crawler Backhoe	54.73	55.95
Certified Welder	57.47	58.75
Digging Machine	49.26	50.36
Tractor Trailer Driver	46.52	47.56
Groundman, Truck Driver	43.78	44.76
Equipment Mechanic	43.78	44.76
Flagman	32.84	33.57

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%

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	07/01/2023	05/06/2024
Lineman, Technician,	\$ 29.40	\$ 30.90

or Equipment Operators with Crane License	*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid
All other Journeyman	\$ 26.40 *plus 7% of the hourly wage paid	\$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for 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 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:

07/01/2023	05/06/2024
\$ 26.40	\$ 26.90
*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWestLT

Mason - Building

10/01/2023

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2023	12/04/2023 Additional	06/05/2024 Additional
Tile Setters	\$ 62.98	\$ 0.72	\$ 0.72

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 25.61*
	+ \$10.04

* 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:

(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
07/01/2023									
\$21.70	\$26.66	\$33.75	\$38.69	\$42.25	\$45.70	\$49.29	\$54.23	\$57.09	\$61.25

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
07/01/2023									
\$12.55*	\$12.55*	\$15.36*	\$15.36*	\$16.36*	\$17.86*	\$18.86*	\$18.86*	\$16.86*	\$22.11*
+\$0.73	+\$0.78	+\$0.88	+\$0.88	+\$1.37	+\$1.42	+\$1.83	+\$1.88	+\$6.03	+\$6.61

* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52A

Mason - Building**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT** 11**ENTIRE COUNTIES**

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour:

07/01/2023

Bricklayer	\$ 45.89
Cement Mason	45.89
Plasterer/Stone Mason	45.89
Pointer/Caulker	45.89

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 workday is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:

Irregular workday 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	\$ 37.95
------------	----------

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, 16, 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-b

Mason - Building**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Building

	07/01/2023	01/01/2024
Wages per hour:		Additional

Mosaic & Terrazzo Mechanic	\$ 60.65	\$1.06
----------------------------	----------	--------

Mosaic & Terrazzo Finisher	59.04	
----------------------------	-------	--

SUPPLEMENTAL BENEFITS

Per hour:

Mosaic & Terrazzo Mechanic	\$ 30.26*
	+ \$9.16

Mosaic & Terrazzo Finisher	\$ 30.26*
	+ \$9.15

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (A, E, Q) on OVERTIME PAGE

07/01/2023- Deduct \$7.25 from hourly wages before calculating overtime.

HOLIDAY

Paid:

See (1) on HOLIDAY PAGE

Overtime:

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

Easter Sunday is an observed holiday. Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

REGISTERED APPRENTICES

Wages Per hour:

1st	2nd	3rd	4th	5th	6th
0-	1501-	3001-	3751-	4501-	5251-
1500	3000	3750	4500	5250	6000
\$ 25.82	\$ 33.19	\$ 36.39	\$ 40.38	\$ 48.52	\$ 54.59

Supplemental Benefits per hour:

\$6.00*	\$7.72*	\$18.16*	\$23.27*	\$24.21*	\$27.24*
+\$3.21	+\$4.12	+\$5.50	+\$6.41	+\$7.33	+\$8.29

*This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/3

Mason - Building**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Per hour:	07/01/2023	07/03/2023
-----------	------------	------------

Building-Marble Restoration:		
Marble, Stone &	\$ 47.22	\$ 47.44

Terrazzo Polisher

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:

Building-Marble Restoration:

Marble, Stone &

Polisher

\$ 30.29

\$ 30.64

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

HOLIDAY

Paid:

See (1) on HOLIDAY PAGE

Overtime:

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

1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

REGISTERED APPRENTICES

WAGES per hour:

900 hour term at the following wage:

1st 1- 900	2nd 901- 1800	3rd 1801- 2700	4th 2701
\$ 33.04	\$ 37.78	\$ 42.49	\$ 47.22

Supplemental Benefits Per Hour:

27.65	28.52	29.41	30.29
-------	-------	-------	-------

07/03/2023

900 hour term at the following wage:

1st 1- 900	2nd 901- 1800	3rd 1801- 2700	4th 2701
\$ 33.19	\$ 37.95	\$ 42.69	\$ 47.44

Supplemental Benefits Per Hour:

27.99	28.86	29.76	30.64
-------	-------	-------	-------

9-7/24-MP

Mason - Building**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Per Hour:

07/01/2023 7/03/2023

Marble Cutters & Setters

\$ 62.82

\$ 63.12

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker

\$ 39.03

\$ 39.34

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:

07/01/2023

750 hour terms at the following wage

1st	2nd	3rd	4th	5th	6th	7th	8th
0- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000	6001- 6750	6751- 7500	7500+
\$ 26.42	\$ 39.62	\$ 42.91	\$ 46.22	\$ 49.52	\$ 53.38	\$ 59.67	\$ 62.82

Supplemental Benefits per hour:

07/01/2023

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 25.38	\$ 28.86	\$ 29.74	\$ 30.60	\$ 31.48	\$ 36.44	\$ 38.17	\$ 39.03

07/03/2023

Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th
0- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000	6001- 6750	6751- 7500	7500+
\$ 26.60	\$ 39.82	\$ 43.13	\$ 46.45	\$ 49.78	\$ 53.64	\$ 59.95	\$ 63.12

Supplemental Benefits Per Hour:

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 25.54	\$ 29.09	\$ 29.97	\$ 30.84	\$ 31.72	\$ 36.73	\$ 38.48	\$ 39.34

9-7/4

Mason - Building**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT 9****ENTIRE COUNTIES**

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2023 12/04/2023 06/03/2024

Tile Finisher	\$ 48.36	Additional \$ 0.59	Additional \$ 0.59
---------------	----------	-----------------------	-----------------------

SUPPLEMENTAL BENEFITS

Per Hour: \$ 22.56*

+ \$9.86

*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**10/01/2023****JOB DESCRIPTION** Mason - Building**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Per hour:	07/01/2023	07/03/2023
Marble, Stone, Maintenance Finishers:	\$ 27.26	\$ 27.44

Note 1: An additional \$2.00 per hour
for time spent grinding floor using
"60 grit" and below.

Note 2: Flaming equipment operator
shall be paid an additional \$25.00 per day.

SUPPLEMENTAL BENEFITS

Per Hour:

Marble, Stone Maintenance Finishers:	\$ 14.97	\$ 15.20
-----------------------------------------	----------	----------

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*Double hourly rate after 8 hours on Saturday

HOLIDAY

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

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

1st term apprentice gets paid for all observed holidays.

REGISTERED APPRENTICES

WAGES per hour:

	07/01/2023	07/03/2023
0-750	\$ 21.89	\$ 22.04
751-1500	22.60	\$ 22.75
1501-2250	23.32	\$ 23.48
2251-3000	24.04	\$ 24.20
3001-3750	25.11	\$ 25.27
3751-4500	26.54	\$ 26.72
4501+	27.26	\$ 27.44

Supplemental Benefits:

Per hour:

0-750	12.03	\$ 12.24
751-1500	12.43	\$ 12.64
1501-2250	12.82	\$ 13.03
2251-3000	13.21	\$ 13.42
3001-3750	13.80	\$ 14.02
3751-4500	14.58	\$ 14.80
4501+	14.97	\$ 15.20

9-7/24M-MF

Mason - Building / Heavy&Highway

10/01/2023

JOB DESCRIPTION Mason - Building / Heavy&Highway**DISTRICT 9****ENTIRE COUNTIES**

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

WAGES

Per hour:	07/01/2023	07/03/2023	01/01/2024 Additional
Marble-Finisher	\$ 49.32	\$ 49.65	\$ 0.53

SUPPLEMENTAL BENEFITS

Journeyworker:

Per hour

Marble- Finisher	\$ 36.62	\$ 36.67
------------------	----------	----------

OVERTIME PAY

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

Work beyond 8 hours on a Saturday shall be paid at double the rate.

HOLIDAY

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

When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Heavy&Highway

10/01/2023

JOB DESCRIPTION Mason - Heavy&Highway**DISTRICT** 11**ENTIRE COUNTIES**

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour:

07/01/2023

Bricklayer	\$ 46.39
Cement Mason	46.39
Marble/Stone Mason	46.39
Plasterer	46.39
Pointer/Caulker	46.39

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 workday is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

Irregular workday 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 \$ 37.95

OVERTIME PAY

Cement Mason See (B, E, Q, W)

All Others See (B, E, Q,)

HOLIDAY

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

Overtime: See (5, 6, 16, 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.

- Supplemental Benefits are not paid for paid Holiday

- If Holiday is worked, Supplemental Benefits are paid for hours worked.

- Whenever an Employee works within three (3) calendar days before a holiday, the Employee shall be paid for the Holiday.

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**10/01/2023****JOB DESCRIPTION** Operating Engineer - Building**DISTRICT** 9**ENTIRE COUNTIES**

Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES

Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES

NOTE: Construction surveying

Party Chief--One who directs a survey party

Instrument Man—One who runs the instrument and assists Party Chief.
Rodman—One who holds the rod and assists the Survey Crew

Wages:(Per Hour) 07/01/2023

Building Construction:

Party Chief	\$ 77.39
Instrument Man	61.25
Rodman	41.39

Steel Erection:

Party Chief	80.16
Instrument Man	63.60
Rodman	44.23

Heavy Construction-NYC counties only:
(Foundation, Excavation.)

Party Chief	85.74
Instrument man	64.40
Rodman	54.90

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2023

Building Construction \$ 28.04* +\$ 7.65

Steel Erection 28.64* +\$ 7.65

Heavy Construction 28.85* +\$ 7.64

* This portion subject to same premium as wages

Non-Worked Holiday Supplemental Benefit:

21.19

OVERTIME PAY

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

Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.

Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

HOLIDAY

Paid: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

9-15Db

Operating Engineer - Building

10/01/2023

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I:

Cranes (All Types up to 49 tons), Boom Trucks, Cherry Pickers (All Types), Clamshell Crane, Derrick (Stone and Steel), Dragline, Franki Pile Rig or similar, High Lift (Lull or similar) with crane attachment and winch used for hoisting or lifting, Hydraulic Cranes, Pile Drivers, Potain and similar.

Cranes (All types 50-99 tons), Drill Rig Casa Grande (CAT or similar), Franki Pile Rig or similar, Hydraulic Cranes (All types including Crawler Cranes- No specific boom length).

Cranes (All types 100 tons and over), All Tower Cranes, All Climbing Cranes irrespective of manufacturer and regardless of how the same is rigged, Franki Pile Rig or similar, Conventional Cranes (All types including Crawler Cranes-No specific boom length), Hydraulic Cranes.

GROUP I-A: Barber Green Loader-Euclid Loader, Bulldozer, Carrier-Trailer Horse, Concrete Cleaning Decontamination Machine Operator, Concrete-Portable Hoist, Conway or Similar Mucking Machines, Elevator & Cage, Excavators all types, Front End Loaders, Gradall, Shovel, Backhoe, etc.(Crawler or Truck), Heavy Equipment Robotics Operator/Mechanic, Hoist Engineer-Material, Hoist Portable Mobile Unit, Hoist(Single, Double or Triple Drum), Horizontal Directional Drill Locator, Horizontal Directional Drill Operator and Jersey Spreader, Letourneau or Tournapull(Scrapers over 20 yards Struck), Lift Slab Console, etc., Lull HiLift or Similar, Master Environmental Maintenance Mechanics, Mucking Machines Operator/Mechanic or Similar Type, Overhead Crane, Pavement Breaker(Air Ram), Paver(Concrete), Post Hole Digger, Power House Plant, Road Boring Machine, Road Mix Machine, Ross Carrier and Similar Machines, Rubber tire double end backhoes and similar machines, Scoopmobile Tractor-Shovel Over 1.5 yards, Shovel (Tunnels), Spreader (Asphalt) Telephie(Cableway), Tractor Type Demolition Equipment, Trenching Machines-Vermeer Concrete Saw Trencher and Similar, Ultra High Pressure Waterjet Cutting Tool System, Vacuum Blasting Machine operator/mechanic, Winch Truck A Frame.

GROUP I-B: Compressor (Steel Erection), Mechanic (Outside All Types), Negative Air Machine (Asbestos Removal), Push Button (Buzz Box) Elevator.

GROUP II: Compactor Self-Propelled, Concrete Pump, Crane Operator in Training (Over 100 Tons), Grader, Machines Pulling Sheep's Foot Roller, Roller (4 ton and over), Scrapers (20 yards Struck and Under), Vibratory Rollers, Welder.

GROUP III-A: Asphalt Plant, Concrete Mixing Plants, Forklift (All power sources), Joy Drill or similar, Tractor Drilling Machine, Loader (1 1/2 yards and under), Portable Asphalt Plant, Portable Batch Plant, Portable Crusher, Skid Steer (Bobcat or similar), Stone Crusher, Well Drilling Machine, Well Point System.

GROUP III-B: Compressor Over 125 cu. Feet, Conveyor Belt Machine regardless of size, Compressor Plant, Ladder Hoist, Stud Machine.

GROUP IV-A: Batch Plant, Concrete Breaker, Concrete Spreader, Curb Cutter Machine, Finishing Machine-Concrete, Fine Grading Machine, Hepa Vac Clean Air Machine, Material Hopper(sand, stone, cement), Mulching Grass Spreader, Pump Gypsum etc, Pump-Plaster-Grout-Fireproofing. Roller(Under 4 Ton),Spreading and Fine Grading Machine, Steel Cutting Machine, Siphon Pump, Tar Joint Machine, Television Cameras for Water, Sewer, Gas etc. Turbo Jet Burner or Similar Equipment, Vibrator (1 to 5).

GROUP IV-B: Compressor (all types), Heater (All Types), Fire Watchman, Lighting Unit (Portable & Generator) Pump, Pump Station(Water, Sewer, Portable, Temporary), Welding Machine (Steel Erection & Excavation).

GROUP V: Mechanics Helper, Motorized Roller (walk behind), Stock Attendant, Welder's Helper, Maintenance Engineer Crane(75 ton and over).

Group VI-A: Welder Certified

GROUP VI-B: Utility Man, Warehouse Man.

WAGES: (per hour)

	07/01/2023	03/04/2024
GROUP I		
Cranes- up to 49 tons	\$ 66.23	\$ 67.43
Cranes- 50 tons to 99 tons	68.53	69.77
Cranes- 100 tons and over	78.21	79.64
GROUP I-A	58.01	59.04
GROUP I-B	53.48	54.41
GROUP II	55.98	56.97
GROUP III-A	53.94	54.88
GROUP III-B	51.35	52.25
GROUP IV-A	53.40	54.33
GROUP IV-B	45.17	45.94
GROUP V	48.69	49.53
Group VI-A	56.96	57.96
GROUP VI-B		
Utility Man	46.21	47.00
Warehouse Man	48.52	49.26

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects.

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour.

Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour.

Loader operators over 5 cubic yard capacity additional .50 per hour.

Shovel operators over 4 cubic yard capacity additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 31.57	\$ 32.32
---------------	----------	----------

OVERTIME PAY

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

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

8-137B

Operating Engineer - Heavy&Highway**10/01/2023****JOB DESCRIPTION** Operating Engineer - Heavy&Highway**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane, (Crawler, Truck),
Dragline, Drill Rig (Casa Grande, Cat, or Similar), Floating Crane (Crane on Barges) under 100 tons, Gin Pole, Hoist Engineer-Concrete (Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger (Truck or Truck Mounted), Boat Captain, Bulldozer-All Sizes, Central Mix Plant Operator, Chipper (all types), Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader (Motor Grader), Elevator & Cage (Materials or Passenger), Excavator (and all attachments), Front End Loaders (1 1/2 yards and over), High Lift Lull and similar, Hoist (Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer (Material), Jack and Bore Machine, Log Skidders, Mill Machines, Mucking Machines, Overhead Crane, Paver (concrete), Post Pounder (of any type), Push Cats, Road Reclaimer, Robot Hammer (Brokk or similar), Robotic Equipment (Scope of Engineer Schedule), Ross Carrier and similar, Scrapers (20 yard struck and over), Side Boom, Slip Form Machine, Spreader (Asphalt), Trenching Machines (Telephies-Vermeer Concrete Saw), Tractor Type Demolition Equipment, Vacuum Truck. Vibratory Roller(Riding) or Roller used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver (Asphalt).

GROUP II-A: Ballast Regulators, Compactor Self Propelled, Fusion Machine, Rail Anchor Machines, Roller (4 ton and over), Scrapers (20 yard struck and under).

GROUP II-B: Mechanic (Outside) All Types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler (High Pressure), Concrete Breaker (Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift (all types), Gas Tapping (Live), Hydroseeder, Loader (1 1/2 yards and under), Locomotive (all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher (Apprentice), Powerhouse Plant, Roller (under 4 ton), Sheer Excavator, Skid Steer/Bobcat, Stone Crusher, Sweeper (with seat), Well Drilling Machine.

GROUP IV: Service Person (Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine (Truck Mounted), Heater (all types), Lighting Unit (Portable), Maintenance Engineer (For Crane Only), Mechanics Helper, Pump (Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck (Sewer Jet or Similar), Welders Helper, Welding Machine (Steel Erection), Well Point System.

GROUP V: All Tower Cranes-All Climbing Cranes and all cranes of 100-ton capacity or greater (3900 Manitowac or similar) irrespective of manufacturer and regardless of how the same is rigged, Hoist Engineer (Steel), Engineer-Pile Driver, Jersey Spreader, Pavement Breaker/Post Hole Digger.

WAGES: Per hour:	07/01/2023	03/04/2024
Group I	\$ 67.27	\$ 68.63
Group I-A	59.26	60.42
Group I-B	62.46	63.70
Group II-A	56.74	57.84
Group II-B	58.52	59.67
Group III	55.74	56.81
Group IV	50.63	51.57
Group IV-B	43.43	44.19
Group V		
Engineer All Tower, Climbing and		

Cranes of 100 Tons	76.24	77.82
Hoist Engineer(Steel)	69.01	70.41
Engineer(Pile Driver)	73.61	75.13
Jersey Spreader, Pavement Breaker (Air Ram)Post Hole Digger	58.06	59.19

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts
on all government mandated off-shift work

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour over the rate listed in the Wage Schedule. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour over the rate listed in the Wage Schedule. Loader and Excavator Operators: over 5 cubic yards capacity \$0.50 per hour over the rate listed in the Wage Schedule. Shovel Operators: over 4 cubic yards capacity \$1.00 per hour over the rate listed in the Wage Schedule.

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:	\$ 33.75 up to 40 Hours	\$ 34.85 up to 40 hours
	After 40 hours \$ 24.50* PLUS \$ 1.25 on all hours worked	After 40 hours \$ 25.55* PLUS \$ 1.25 on all hours worked

*This amount is subject to premium

OVERTIME PAY

See (B, E, P, *R, **U) on OVERTIME PAGE

HOLIDAY

Paid:..... See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime..... See (5, 6, 8, 15, 25, 26) on OVERTIME PAGE

* For Holiday codes 8,15,25,26 code R applies

** For Holiday Codes 5 & 6 code U applies

Note: If employees are required to work on Easter Sunday they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rate.

1st term	\$ 29.63	\$ 30.21
2nd term	35.56	36.25
3rd term	41.48	42.30
4th term	47.41	48.34
Supplemental Benefits per hour:		
	25.70	26.85

8-137HH

Operating Engineer - Heavy&Highway

10/01/2023

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: South of the North city line of Poughkeepsie

WAGES

Party Chief - One who directs a survey party

Instrument Man - One who runs the instrument and assists Party Chief

Rodman - One who holds the rod and in general, assists the Survey Crew
Categories cover GPS & Underground Surveying

Per Hour: 07/01/2023

Party Chief	\$ 81.72
Instrument Man	61.43
Rodman	52.40

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2023

All Categories
Straight Time: \$ 25.25* + \$7.64

Premium:
Time & 1/2 \$ 37.88* + \$7.64

Double Time \$ 50.50* + \$7.64

Non-Worked Holiday Supplemental Benefits:
\$ 21.19

OVERTIME PAY

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

* Doubletime paid on all hours in excess of 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

9-15Dh

Operating Engineer - Heavy&Highway - Tunnel**10/01/2023****JOB DESCRIPTION** Operating Engineer - Heavy&Highway - Tunnel**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane(Crawler, Truck), Dragline, Drill Rig Casa Grande(Cat or Similar), Floating Crane(Crane on Barge-Under 100 Tons), Hoist Engineer(Concrete/Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger(Truck or Truck Mounted), Boat Captain, Bull Dozer-all sizes, Central Mix Plant Operator, Chipper-all types, Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader(Motor Grader), Elevator & Cage(Materials or Passengers), Excavator(and all attachments), Front End Loaders(1 1/2 yards and over), High Lift Lull, Hoist(Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer(Material), Jack and Bore Machine, Log Skidder, Milling Machine, Moveable Concrete Barrier Transfer & Transport Vehicle, Mucking Machines, Overhead Crane, Paver(Concrete), Post Pounder of any type, Push Cats, Road Reclaimer, Robot Hammer(Brokk or similar), Robotic Equipment(Scope of Engineer Schedule), Ross Carrier and similar machines, Scrapers(20 yards struck and over), Side Boom, Slip Form Machine, Spreader(Asphalt), Trenching Machines, Telephies-Vermeer Concrete Saw, Tractor type demolition equipment, Vacuum Truck, Vibratory Roller (Riding) used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver(Asphalt).

GROUP II-A: Ballast Regulators, Compactor(Self-propelled), Fusion Machine, Rail Anchor Machines, Roller(4 ton and over), Scrapers(20 yard struck and under).

GROUP II-B: Mechanic(outside)all types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler(High Pressure), Concrete Breaker(Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift(all types of power), Gas Tapping(Live), Hydroseeder, Loader(1 1/2 yards and under), Locomotive(all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher(Apprentice), Powerhouse Plant, Roller(under 4 ton), Sheer Excavator, Skidsteer/Bobcat, Stone Crusher, Sweeper(with seat), Well Drilling Machine.

GROUP IV-A: Service Person(Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine(Truck Mounted), Heater(all types), Lighting Unit(Portable), Maintenance Engineer(for Crane only), Mechanics Helper, Pump(Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck(Sewer Jet or similar), Welding Machine(Steel Erection), Welders Helper.

GROUP V-A: Engineer(all Tower Cranes, all Climbing Cranes & all Cranes of 100 ton capacity or greater), Hoist Engineer(Steel-Sub Structure), Engineer-Pile Driver, Jersey-Spreader, Pavement breaker, Post Hole Digger

WAGES: (per hour)

	07/01/2023	03/04/2024
GROUP I	\$ 67.27	\$ 68.63
GROUP I-A	59.26	60.42
GROUP I-B	62.46	63.70
GROUP II-A	56.74	57.84
GROUP II-B	58.52	59.67
GROUP III	55.74	56.81
GROUP IV-A	50.63	51.57
GROUP IV-B	43.43	44.19
GROUP V-A		
Engineer-Cranes	76.24	77.82
Engineer-Pile Driver	73.61	75.13
Hoist Engineer	69.01	70.41
Jersey Spreader/Post Hole Digger	58.06	59.19

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts
on all government mandated off-shift work

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects. Operators required to use two buckets pouring concrete on other than road pavement shall receive \$0.50 per hour over scale. Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour. Operators of shovels with a capacity over (4) cubic yards shall be paid an additional \$1.00 per hour. Operators of loaders with a capacity over (5) cubic yards shall be paid an additional \$0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

\$ 33.75 up to 40 hours	\$ 34.85 up to 40 hours
After 40 hours	After 40 hours
\$24.50 plus	\$25.55 plus
\$1.25 on all hours worked	\$1.25 on all hours worked

OVERTIME PAY

See (D, O, *U, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

* Note: For Holiday codes 5 & 6, code U applies. For Holiday codes 8, 15, 25, 26, code R applies.

Note: If employees are required to work on Easter Sunday, they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rates:

1st term	\$ 29.63	\$ 30.21
2nd term	35.56	36.25
3rd term	41.48	42.30
4th term	47.41	48.34

Supplemental Benefits per hour:

All terms	\$ 25.70	\$ 26.85
-----------	----------	----------

8-137Tun

JOB DESCRIPTION Operating Engineer - Marine Dredging**DISTRICT 4****ENTIRE COUNTIES**

Albany, Bronx, Cayuga, Clinton, Columbia, Dutchess, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Orange, 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:	07/01/2023	10/01/2023
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	\$ 43.94	\$ 45.26
CLASS A2 Crane Operator (360 swing)	39.16	40.33
CLASS B Dozer, Front Loader Operator on Land	To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator	38.00	39.14
CLASS B2 Certified Welder	35.77	36.84
CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	34.79	35.83
CLASS C2 Boat Operator	33.67	34.68
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	27.97	28.81

SUPPLEMENTAL BENEFITS

Per Hour:

THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B	\$ 11.85 plus 6% of straight time wage, Overtime hours add \$ 0.63	\$ 12.00 plus 6% of straight time wage, Overtime hours add \$ 0.63
All Class C	\$ 11.60 plus 6% of straight time wage, Overtime hours add \$ 0.50	\$ 11.75 plus 6% of straight time wage, Overtime hours add \$ 0.50
All Class D	\$ 11.35 plus 6% of straight time	\$ 11.60 plus 6% of straight time

wage, Overtime hours
add \$ 0.38wage, Overtime hours
add \$ 0.50**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 - Survey Crew - Consulting Engineer**10/01/2023****JOB DESCRIPTION** Operating Engineer - Survey Crew - Consulting Engineer**DISTRICT 9****ENTIRE COUNTIES**

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

PARTIAL COUNTIES

Dutchess: That part in Dutchess County lying South of the North City line of Poughkeepsie.

WAGES

Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

Per hour: 07/01/2023

Survey Classifications

Party Chief	\$ 47.15
Instrument Man	39.30
Rodman	34.35

SUPPLEMENTAL BENEFITS

Per Hour:

All Crew Members: \$ 23.15

OVERTIME PAY

OVERTIME:..... See (B, E*, Q, V) ON OVERTIME PAGE.

*Double-time paid on the 9th hour on Saturday.

HOLIDAY

Paid:

See (5, 6, 7, 11, 16) on HOLIDAY PAGE

Overtime:

See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

Painter**10/01/2023****JOB DESCRIPTION** Painter**DISTRICT 8****ENTIRE COUNTIES**

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

WAGES

Per hour: 07/01/2023

Brush \$ 51.70*

Abatement/Removal of lead based
or lead containing paint on
materials to be repainted. 51.70*

Spray & Scaffold \$ 54.70*

Fire Escape 54.70*

Decorator 54.70*

Paperhanger/Wall Coverer 54.48*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:

Paperhanger	\$ 34.60
All others	32.73
Premium	36.70**

****Applies only to "All others" category, not paperhanger journeyworker.****OVERTIME PAY**

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rate.

Per hour:	07/01/2023
Appr 1st term...	\$ 19.95*
Appr 2nd term...	25.56*
Appr 3rd term...	31.05*
Appr 4th term...	41.62*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental benefits:

Per Hour:	
Appr 1st term...	\$ 16.06
Appr 2nd term...	19.95
Appr 3rd term...	23.02
Appr 4th term...	29.16

8-NYDC9-B/S

Painter**10/01/2023****JOB DESCRIPTION** Painter**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Suffolk, Westchester

PARTIAL COUNTIES

Nassau: All of Nassau except the areas described below: Atlantic Beach, Ceadhurst, East Rockaway, Gibson, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on the South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave., Rockville Centre is the boundary line up to Lawson Blvd. turn right going west all the above territory. Starting at Union Turnpike and Lakeville Rd. going north to Northern Blvd. the west side of Lakeville road to Northern blvd. At Northern blvd. going east the district north of Northern blvd. to Port Washington Blvd. West of Port Washington blvd. to St. Francis Hospital then north of first traffic light to Port Washington and Sands Point, Manor Haven, Harbour Acres.

WAGES

Per hour:	07/01/2023
Drywall Taper	\$ 51.45*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:	
Journeyman	\$ 30.88

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages - Per Hour:

1500 hour terms at the following wage rate:

1st term	\$ 19.95*
2nd term	25.56*
3rd term	31.00*
4th term	41.52*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental Benefits - Per hour:

One year term (1500 hours) at the following dollar amount.

1st year	\$ 15.22
2nd year	18.90
3rd year	21.81
4th year	27.58

8-NYDCT9-DWT

Painter - Bridge & Structural Steel**10/01/2023****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:	07/01/2023	10/01/2023
	\$ 54.50	\$ 56.00
	+ 10.10*	+ 10.35*

ADDITIONAL \$6.50 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:	\$ 11.78	\$ 12.43
	+ 30.85*	+ 31.55*

* 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.

1st year	\$ 21.80	\$ 22.40
	+ 4.04	+ 4.14
2nd year	\$ 32.70	\$ 33.60
	+ 6.06	+ 6.21
3rd year	\$ 43.60	\$ 44.80
	+ 8.08	+ 8.28

Supplemental Benefits - Per hour:

1st year	\$.90 + 12.34	\$ 1.16 + 12.62
2nd year	\$ 7.07 + 18.51	\$ 7.46 + 18.93
3rd year	\$ 9.42 + 24.68	\$ 9.94 + 25.24

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Line Striping**10/01/2023****JOB DESCRIPTION** Painter - Line Striping**DISTRICT 8****ENTIRE COUNTIES**

Albany, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Montgomery, Nassau, Orange, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per hour:

Painter (Striping-Highway):	07/01/2023	01/01/2024	07/01/2024
Striping-Machine Operator*	\$ 31.53	\$ 31.53	\$ 34.12
Linerman Thermoplastic	38.34	38.34	41.12

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.

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour paid:

Journeyworker:

Striping Machine Operator:	\$ 10.03	\$ 22.24	\$ 23.65
Linerman Thermoplastic:	10.03	22.24	23.65

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:

1st Term:	\$ 15.00	\$ 15.00	\$ 15.00
2nd Term:	18.92	18.92	20.47
3rd Term:	25.22	25.22	27.30

Supplemental Benefits per hour:

1st term:	\$ 9.16	\$ 22.24	\$ 23.65
2nd Term:	10.03	22.24	23.65
3rd Term:	10.03	22.24	23.65

8-1456-LS

Painter - Metal Polisher**10/01/2023****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

	07/01/2023
Metal Polisher	\$ 38.18
Metal Polisher*	39.28
Metal Polisher**	42.18

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2023

Journeyworker:

All classification \$ 12.34

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:

	07/01/2023
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	\$ 8.69
2nd year	8.69
3rd year	8.69

8-8A/28A-MP

Plumber

10/01/2023

JOB DESCRIPTION Plumber

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

Per hour:

	07/01/2023
Plumber and Steamfitter	\$ 62.36

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 41.51

OVERTIME PAY

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

OVERTIME:... See on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following wages:

1st Term	\$ 23.20
2nd Term	26.61
3rd Term	30.74
4th Term	43.81
5th Term	46.99

Supplemental Benefits per hour:

1st term	\$ 17.12
2nd term	19.12
3rd term	22.74
4th term	30.02
5th term	31.82

8-21.1-ST

Plumber - HVAC / Service

10/01/2023

JOB DESCRIPTION Plumber - HVAC / Service**DISTRICT 8****ENTIRE COUNTIES**

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Delaware: Only the townships of Middletown and Roxbury

Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2023

HVAC Service \$ 42.68
+ \$ 4.37*

*Note: This portion of wage is not subject to overtime premium.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker HVAC Service
\$ 28.99**OVERTIME PAY**

See (B, F, R) on OVERTIME PAGE

HOLIDAY

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

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

HVAC SERVICE

(1)year terms at the following wages:

1st yr. 2nd yr. 3rd yr. 4th yr. 5th yr.

\$ 19.32	\$ 22.91	\$ 28.56	\$ 35.13	\$ 38.15
+\$2.39*	+\$2.70*	+\$3.25*	+\$3.88*	+\$4.12*

*Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices	07/01/2023
1st term	\$ 20.84
2nd term	22.28
3rd term	23.85
4th term	26.01
5th term	27.55

8-21.1&2-SF/Re/AC

Plumber - Jobbing & Alterations**10/01/2023****JOB DESCRIPTION** Plumber - Jobbing & Alterations**DISTRICT 8****ENTIRE COUNTIES**

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour:	07/01/2023
Journeyworker:	\$ 48.51

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:
Journeyworker

\$ 34.76

OVERTIME PAY

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

*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wages:

1st year	\$ 20.92
2nd year	23.24
3rd year	25.29
4th year	35.48
5th year	37.49

Supplemental Benefits per hour:

1st year	\$ 11.45
2nd year	13.46
3rd year	17.51
4th year	23.67
5th year	25.68

8-21.3-J&A

Roofer**10/01/2023**

JOB DESCRIPTION Roofer**DISTRICT 9****ENTIRE COUNTIES**

Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES

Per Hour:	07/01/2023	05/01/2024
		Additional
Roofer/Waterproofer	\$ 46.50	\$2.50
	+ \$7.00*	

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS

Per Hour: \$ 31.37

OVERTIME PAY

See (B, H) on OVERTIME PAGE

Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAYPaid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE**REGISTERED APPRENTICES**

(1) year term apprentices indentured prior to 01/01/2023

	1st	2nd	3rd	4th
	\$ 16.28	\$ 23.25	\$ 27.90	\$ 34.88
		+ 3.50*	+ 4.20*	+ 5.26*
Supplements:				
	1st	2nd	3rd	4th
	\$ 4.03	\$ 15.85	\$ 18.95	\$ 23.61

* This portion is not subjected to overtime premiums.

(1) year term apprentices indentured after 01/01/2023

	1st	2nd	3rd	4th	5th
	\$ 17.67	\$ 20.93	\$ 23.25	\$ 27.90	\$ 34.88
		+ 3.16*	+ 3.50*	+ 4.20*	+ 5.26
Supplements:					
	1st	2nd	3rd	4th	5th
	\$ 7.61	\$ 14.29	\$ 15.85	\$ 18.95	\$ 23.61

* This portion is not subjected to overtime premiums.

9-8R

Sheetmetal Worker**10/01/2023****JOB DESCRIPTION** Sheetmetal Worker**DISTRICT 8****ENTIRE COUNTIES**

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

	07/01/2023
SheetMetal Worker	\$ 47.00
	+ 3.60*

*This portion is not subject to overtime premiums.

SHIFT WORKFor 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 \$ 45.62

OVERTIME PAY

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

HOLIDAYPaid: 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
\$ 17.50	\$ 19.67	\$ 21.87	\$ 24.05	\$ 26.24	\$ 28.44	\$ 31.10	\$ 33.75
+ 1.44*	+ 1.62*	+ 1.80*	+ 1.98*	+ 2.16*	+ 2.34*	+ 2.52*	+ 2.70*

*This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices

1st term	\$ 19.53
2nd term	21.99
3rd term	24.42
4th term	26.88
5th term	29.32
6th term	31.75
7th term	33.72
8th term	35.71

8-38

Sheetmetal Worker**10/01/2023****JOB DESCRIPTION** Sheetmetal Worker**DISTRICT 4****ENTIRE COUNTIES**

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

WAGES

Per Hour: 07/01/2023

Sign Erector \$ 56.00

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2023

Sign Erector \$ 55.66

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:

07/01/2023

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 14.95	\$ 16.95	\$ 18.93	\$ 20.93	\$ 28.56	\$ 31.05	\$ 33.57	\$ 36.05	\$ 38.56	\$ 41.05

4-137-SE

Sprinkler Fitter**10/01/2023****JOB DESCRIPTION** Sprinkler Fitter**DISTRICT 1****ENTIRE COUNTIES**

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

Per hour 07/01/2023

Sprinkler \$ 50.86

Fitter

SUPPLEMENTAL BENEFITS

Per hour

Journey person \$ 30.19

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 wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 24.77	\$ 27.53	\$ 30.03	\$ 32.78	\$ 35.53	\$ 38.29	\$ 41.04	\$ 43.79	\$ 46.54	\$ 49.30

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.74	\$ 8.74	\$ 20.32	\$ 20.32	\$ 20.57	\$ 20.57	\$ 20.57	\$ 20.57	\$ 20.57	\$ 20.57
									1-669.2

Teamster - Building / Heavy&Highway**10/01/2023****JOB DESCRIPTION** Teamster - Building / Heavy&Highway**DISTRICT 8****ENTIRE COUNTIES**

Putnam, Westchester

WAGES

GROUP A: Straight Trucks (6-wheeler and 10-wheeler), A-frame, Winch, Dynamite Seeding, Mulching, Agitator, Water, Attenuator, Light Towers, Cement (all types), Suburban, Station Wagons, Cars, Pick Ups, any vehicle carrying materials of any kind.

GROUP AA: Tack Coat

GROUP B: Tractor & Trailers (all types).

GROUP BB: Tri-Axle, 14 Wheeler

GROUP C: Low Boy (carrying equipment).

GROUP D: Fuel Trucks, Tire Trucks.

GROUP E: Off-road Equipment (over 40 tons): Athey Wagons, Belly Dumps, Articulated Dumps, Trailer Wagons.

GROUP F: Off-road Equipment (over 40 tons) Euclid, DJB.

GROUP G: Off-road Equipment (under 40 tons) Athey Wagons, Belly Articulated Dumps, Trailer Wagons.

GROUP H: Off-road Equipment (under 40 tons), Euclid.

GROUP HH: Off-road Equipment (under 40 tons) D.J.B.

GROUP I: Off-road Equipment (under 40 tons) Darts.

GROUP II: Off-road Equipment (under 40 tons) RXS.

WAGES:(per hour)

07/01/2023

GROUP A	\$ 46.86*
GROUP AA	49.86*
GROUP B	47.48*
GROUP BB	46.98*
GROUP C	49.61*
GROUP D	47.31*
GROUP E	47.86*
GROUP F	48.86*
GROUP G	47.61*
GROUP H	48.23*
GROUP HH	48.61*
GROUP I	48.36*
GROUP II	48.73*

* To calculate premium wage, subtract \$.10 from the hourly wage.

Note: Fuel truck operators on construction sites addit. \$5.00 per day.
For work on hazardous/toxic waste site addit. 20% of hourly rate.

Shift Differential: When mandated by the contracting agency, DOT, or any governmental agency contracts shall receive a shift differential of fifteen (15%) above the wage rate.

NOTE: The Employer Registration (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects 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. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

First 40 hours	\$ 35.58
41st-45th hours	15.73
Over 45 hours	1.60

OVERTIME PAY

See (B, E, P, R) on OVERTIME PAGE

HOLIDAY

Paid:

See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

Overtime:

See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

8-456

Welder

10/01/2023

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 07/01/2023

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

(29) Juneteenth

New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12226

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).

- | | |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <input type="checkbox"/> 01 DOT | <input type="checkbox"/> 07 City |
| <input type="checkbox"/> 02 OGS | <input type="checkbox"/> 08 Local School District |
| <input type="checkbox"/> 03 Dormitory Authority | <input type="checkbox"/> 09 Special Local District, i.e.,
Fire, Sewer, Water District |
| <input type="checkbox"/> 04 State University
Construction Fund | <input type="checkbox"/> 10 Village |
| <input type="checkbox"/> 05 Mental Hygiene
Facilities Corp. | <input type="checkbox"/> 11 Town |
| <input type="checkbox"/> 06 OTHER N.Y. STATE UNIT | <input type="checkbox"/> 12 County |
| | <input type="checkbox"/> 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 :

- | | |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input type="checkbox"/> Construction (Building, Heavy
Highway/Sewer/Water) | <input type="checkbox"/> Fuel Delivery |
| <input type="checkbox"/> Tunnel | <input type="checkbox"/> Guards, Watchmen |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Janitors, Porters, Cleaners,
Elevator Operators |
| <input type="checkbox"/> Landscape Maintenance | <input type="checkbox"/> Moving furniture and
equipment |
| <input type="checkbox"/> Elevator maintenance | <input type="checkbox"/> Trash and refuse removal |
| <input type="checkbox"/> Exterminators, Fumigators | <input type="checkbox"/> Window cleaners |
| <input type="checkbox"/> Fire Safety Director, NYC Only | <input type="checkbox"/> Other (Describe) |

9. Does this project comply with the Wicks Law involving separate bidding? YES ☐ NO ☐

10. Name and Title of Requester

Signature



NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

**LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE
AWARDED ANY PUBLIC WORK CONTRACT**

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: <https://apps.labor.ny.gov/EDList/searchPage.do>

For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL	*****5754	0369 CONTRACTORS, LLC		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
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	05/29/2019	05/29/2024
DOL	NYC		ALL COUNTY SEWER & DRAIN, INC.		7 GREENFIELD DR WARWICK NY 10990	03/25/2022	03/25/2027
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		ANGELO GARCIA		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL		ANGELO TONDO		449 WEST MOMBSHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL	*****4231	ANKER'S ELECTRIC SERVICE, INC.		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	NYC		ARADCO CONSTRUCTION CORP		115-46 132RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
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	NYC	*****2591	AVI 212 INC.		260 CROPSY AVENUE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	NYC		AVM CONSTRUCTION CORP		117-72 123RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****8421	B & B DRYWALL, INC		206 WARREN AVE APT 1WHITE PLAINS NY 10603	12/14/2021	12/14/2026
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	NYC	*****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		BERNARD BEGLEY		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	NYC	*****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL	*****3627	BJB CONSTRUCTION CORP.		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
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		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	*****4083	C.P.D. ENTERPRISES, INC		P.O BOX 281 WALDEN NY 12586	03/03/2020	03/03/2025
DOL	DOL	*****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	DOL	*****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	AG	*****7247	CENTURY CONCRETE CORP		2375 RAYNOR ST RONKONKOMA NY 11779	08/04/2021	08/04/2026

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	DOL	*****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	NYC		CHARLES ZAHRAKKA		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CHRISTOPHER PAPASTEFANOU A/K/A CHRIS PAPASTEFANOU		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		CRAIG JOHANSEN		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL	*****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	*****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	DOL	*****7619	DANCO CONSTRUCTION UNLIMITED INC.		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL		DANIEL ROBERT MCNALLY		7 GREENFIELD DRIVE WARWICK NY 10990	03/25/2022	03/25/2027
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	*****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	AG		EDWIN HUTZLER		23 NORTH HOWELLS RD BELLPORT NY 11713	08/04/2021	08/04/2026
DOL	DA		EDWIN HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	NYC	*****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DA		FREDERICK HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
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	NYC		GAYATRI MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
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	DA		GIOVANNA TRAVAJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	DOL	*****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.M.J CONSTRUCTION		151 OSTRANDER AVENUE SYRACUSE NY 13205	11/21/2022	11/21/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	12/12/2022	12/12/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JAMES J. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****7993	JBS DIRT, INC.		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	*****2435	JEFFEL D. JOHNSON	JMJ7 AND SON	5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JEFFEL JOHNSON ELITE CARPENTER REMODEL AND CONSTRUCTION		C2 EVERGREEN CIRCLE LIVERPOOL NY 13090	11/21/2022	11/21/2027
DOL	DOL	*****2435	JEFFREY M. JOHNSON	JMJ7 AND SON	5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JIM PLAUGHER		17613 SANTE FE LINE ROAD WAYNEFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		JMJ7 & SON CONSTRUCTION, LLC		5553 CAIRNS TRAIL LIVERPOOL NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 AND SONS CONTRACTORS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS		7014 13TH AVENUE BROOKLYN NY 11228	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS AND SONS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS, LLC		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN MARKOVIC		47 MANDON TERRACE HAWTHORN NJ 07506	03/29/2021	03/29/2026
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296 EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORGE RAMOS		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302 STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSEPH K. SALERNO		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL		JOSEPH K. SALERNO II		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	DOL	*****1147	JRN CONSTRUCTION, LLC	531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JRN PAVING, LLC	531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JRN PAVING, LLC	531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JULIUS AND GITA BEHREND	5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KARIN MANGIN	796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR	7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL	*****2959	KELC DEVELOPMENT, INC	7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KIMBERLY F. BAKER	7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION	150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		LEROY E. NELSON JR	531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		LEROY E. NELSON JR	531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	AG	*****3291	LINTECH ELECTRIC, INC.	3006 TILDEN AVE BROOKLYN NY 11226	02/16/2022	02/16/2027
DOL	DOL		LOUIS A. CALICCHIA	1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA	27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.	27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL	*****2196	MAINSTREAM SPECIALTIES, INC.	11 OLD TOWN RD SELKIRK NY 12158	02/02/2021	02/02/2026
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	NYC		MARIA NUBILE	84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL		MATTHEW P. KILGORE	4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
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	DOL	*****1320	MJC MASON CONTRACTING, INC.	42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL	*****1320	MJC MASON CONTRACTING, INC.	42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	NYC		MUHAMMED A. HASHEM	524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		NAMOW, INC.	84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL	*****7790	NATIONAL BUILDING & RESTORATION CORP	1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****1797	NATIONAL CONSTRUCTION SERVICES, INC	1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DA	*****9786	NATIONAL INSULATION & GC CORP	180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	NYC		NAVIT SINGH	402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE	3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE	3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE	3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTI ON, INC.	444 SCHANTZ ROAD ALLENTOWN PA 18104	09/17/2020	09/17/2025
DOL	NYC	*****5643	NYC LINE CONTRACTORS, INC.		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL		PETER STEVENS		8269 21ST ST BELLEROSSE NY 11426	12/22/2022	12/22/2027
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
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	07/11/2022	07/11/2027
DOL	DA	*****7559	REGAL CONTRACTING INC.		24 WOODBINE AVE NORTHPORT NY 11768	10/01/2020	10/01/2025
DOL	DOL	*****9148	RICH T CONSTRUCTION		107 WILLOW WOOD LANE CAMILLUS NY 13031	11/13/2018	11/13/2023
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		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	07/11/2022	07/11/2027
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	*****7172	RZ & AL INC.		198 RIDGE AVENUE VALLEY STREAM NY 11581	06/06/2022	06/06/2027
DOL	DOL	*****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		SAL FRESINA MASONRY CONTRACTORS, INC.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		SAL MASONRY CONTRACTORS, INC.		(SEE COMMENTS) SYRACUSE NY 13202	07/16/2021	07/16/2026
DOL	DOL	*****9874	SALFREE ENTERPRISES INC		P.O BOX 14 2821 GARDNER RD POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		SALVATORE A FRESINA A/K/A SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	DOL		SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DA	*****0476	SAMCO ELECTRIC CORP.		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	NYC	*****1130	SCANA CONSTRUCTION CORP.		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL	*****2045	SCOTT DUFFIE	DUFFIE'S ELECTRIC, INC.	P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SCOTT DUFFIE		P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	NYC	*****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DR MONROE NY 10950	03/20/2019	03/20/2024
DOL	DA		SILVANO TRAVAJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DOL	*****0440	SOLAR GUYS INC.		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	NYC		SOMATIE RAMSUNAHAI		115-46 132ND ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL	*****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC	*****3661	SPANIER BUILDING MAINTENANCE CORP		200 OAK DRIVE SYOSSET NY 11791	03/14/2022	03/14/2027
DOL	DOL		STANADOS KALOGELAS		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
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	*****9528	STEEL-IT, LLC.		17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		STEFANOS PAPASTEFANOU, JR. AKA STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL	*****3800	SUBURBAN RESTORATION CO. INC.		5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410	03/29/2021	03/29/2026
DOL	DOL	*****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	*****9150	SURGE INC.		8269 21ST STREET BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL		SYED RAZA		198 RIDGE AVENUE NY 11581	06/06/2022	06/06/2027
DOL	DOL	*****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL	*****9733	TERSAL CONSTRUCTION SERVICES INC		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208	07/16/2021	07/16/2026
DOL	DOL		TERSAL CONTRACTORS, INC.		221 GARDNER RD P.O BOX 14POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		TERSAL DEVELOPMENT CORP.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		TEST		P.O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	*****6789	TEST1000		P.O BOX 123 ALBANY NY 12044	03/01/2021	03/01/2026
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	*****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DA	*****1050	TRI STATE CONSTRUCTION OF NY CORP.		50-39 175TH PLACE FRESH MEADOWS NY 11365	03/28/2022	03/28/2027
DOL	DA	*****4106	TRIPLE H CONCRETE CORP		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****8210	UPSTATE CONCRETE & MASONRY CONTRACTING CO INC		449 WEST MOMBSHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	*****6418	VALHALLA CONSTRUCTION, LLC.		796 PHLEPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	*****2426	VICKRAM MANGRU	VICK CONSTRUCTI ON	21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	NYC		VICKRAM MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024

NYSDOL Bureau of Public Work Debarment List 10/03/2023

Article 8

DOL	NYC		VIKTAR PATONICH		2630 CROSEY AVE BROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC	*****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	*****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL	*****8266	WILLIAM CHRIS MCCLENDON	MCCLENDON ASPHALT PAVING	1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM CHRIS MCCLENDON		1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM G. PROERFRIEDT		85 SPRUCEWOOD ROAD WEST BABYLON NY 11704	01/19/2021	01/19/2026
DOL	DOL	*****5924	WILLIAM G. PROPHY, LLC	WGP CONTRACTIN G, INC.	54 PENTAQUIT AVE BAYSHORE NY 11706	01/19/2021	01/19/2026
DOL	DOL	*****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023

PROJECT MANUAL
and SPECIFICATIONS for

PROJECT TITLE:

**INTERIOR RENOVATIONS AT:
40 PELHAM ROAD
NEW ROCHELLE, NEW YORK**

FOR:

City of New Rochelle

Element 
Architectural Group

12 NORTH STATE RT.17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH: 201.368.7752 FAX: 201.368.7758 WWW.ELEMENTARCHGROUP.COM

ARCHITECT'S PROJECT NO.: 2023-12
10-06-2023

SECTION 00000
TABLE OF CONTENTS

	PAGES
INVITATION TO BIDDERS	2
“SCHEDULE A” TO THE GENERAL AGREEMENT	3
INSURANCE REQUIREMENTS	5
SECTION A – INSTRUCTIONS TO BIDDERS	A1 - A18
1. PROCEDURES OF SUBMITTING A BID	A1 - A3
A. CONTENTS	A1
B. EXAMINATION OF PLANS, SPECIFICATIONS, ADDENDA, ETC	A1
C. BIDDING TIME AND FORM	A1
D. BID TO COVER EVERY ITEM	A1
E. BIDDING FORM NOT TO BE TAKEN APART	A1
F. CERTIFIED CHECK, CASHIER’S CHECK, BID BOND or CASH	A2
G. APPROXIMATE ESTIMATES of QUANTITIES	A2
H. CONSTRUCTION CONDITIONS	A3
I. TIME FOR COMPLETION	A3
J. REJECTION OF BIDS	A3
2. CONDITIONS TO BE MET BY SUCCESSFUL BIDDER	A4 - A17
A. COMPLIANCE WITH CONTRACT PROVISIONS	A4
B. COMPLIANCE WITH LABOR and OTHER LAWS	A4
C. INSURANCE REQUIRED	A4
D. BOND REQUIRED	A4
E. BIDDER TO BE COMPETENT	A5
F. AWARD OF CONTRACT	A5
G. NOTIFICATION to CONTRACTOR - EEO	A5
H. NONDISCRIMINATION AND EEO POLICY STATEMENT	A6 – A8
I. NYS AFFIRMATIVE ACTION REQUIREMENTS	A9 – A17
SECTION B – BIDDER’S PROPOSAL	B1 – B10
BID SCHEDULE OF PRICES	B10
SECTION C – GENERAL AGREEMENT	C1 – C23
1. GENERAL	C1 – C8
2. CONDUCT AND INSPECTION OF WORK	C8 - C12
3. COMPLIANCE WITH LAWS AND REGULATIONS	C12 - C15
4. PAYMENT FOR WORK	C15 – C23
SECTION D – EXECUTION OF CONTRACT	D1 – D4
SECTION E – FORM OF BONDS	E1 –E5
SECTION F - PREVAILING WAGE RATES	F1
3. GENERAL PROCEDURES	
SECTION 01100 – SUMMARY	
SECTION 01300 – ADMINISTRATIVE REQUIREMENTS	
SECTION 01400 – QUALITY REQUIREMENTS	
SECTION 01425 – REFERENCE STANDARDS	
SECTION 01450 – CUTTING AND PATCHING	

SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS
SECTION 01565 – SECURITY MEASURES
SECTION 01600 – PRODUCT REQUIREMENTS
SECTION 01700 – EXECUTION REQUIREMENTS
SECTION 01780 – CLOSEOUT SUBMITTALS

4. TECHNICAL SPECIFICATIONS

ARCHITECTURAL

SECTION 022230 – SELECTIVE DEMOLITION
SECTION 055000 – METAL FABRICATIONS
SECTION 064100 – ARCHITECTURAL WOOD CASEWORK
SECTION 061000– ROUGH CARPENTRY
SECTION 078400 – FIRESTOPPING
SECTION 079000 – JOINT SEALERS
SECTION 081100 – CUSTOM STEEL FRAMES AND DOORS
SECTION 085113 – ALUMINUM WINDOWS
SECTION 087100 – DOOR HARDWARE
SECTION 092210 – NON-STRUCTURAL METAL FRAMING
SECTION 092600 – GYPSUM BOARD
SECTION 095110 – SUSPENDED ACOUSTICAL CEILING
SECTION 096500 – RESILIENT FLOORING
SECTION 096700 – FLUID APPLIED FLOORING
SECTION 099000 – PAINTS AND COATINGS
SECTION 101400 - SIGNS
SECTION 101700 – PLASTIC TOILET COMPARTMENTS
SECTION 108000 – TOILET ACCESSORIES

MECHANICAL ENGINEERING – PLUMBING

SECTION 220500 – COMMON WORK RESULTS FOR PLUMBING
SECTION 220523 – VALVES
SECTION 220529 – PIPE HANGERS AND SUPPORTS
SECTION 220553 – PIPE AND VALVE IDENTIFICATION
SECTION 220576 – DRAINAGE ACCESSORIES
SECTION 220577 – FLOOR AND AREA DRAINS
SECTION 220700 – PIPING INSULATION
SECTION 220800 – CLEANING AND TESTING
SECTION 221100 – DOMESTIC WATER PIPING
SECTION 221119 – WATER SUPPLY ACCESSORIES
SECTION 221300 – SANITARY WASTE AND VENT PIPING
SECTION 224200 – PLUMBING FIXTURES

ELECTRICAL ENGINEERING

SECTION 260010 – GENERAL PROVISIONS FOR ELECTRICAL WORK
SECTION 260519 – WIRING, GENERAL – 600 VOLTS AND UNDER
SECTION 260529 – FASTENERS, ATTACHMENTS, AND SUPPORTING DEVICES
SECTION 260533 – RACEWAYS
SECTION 260534 – OUTLET, JUNCTION AND PULL BOXES
SECTION 262815 – OVERCURRENT PROTECTIVE DEVICES, CIRCUIT BREAKERS AND FUSES

END OF TABLE OF CONTENTS

SECTION 01100 SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: **INTERIOR RENOVATIONS at 40 PELHAM ROAD, NEW ROCHELLE, NY**

1. Project Date and Date of Bid Documents: **October 5, 2023**

B. Project Locations:
40 PELHAM ROAD, NEW ROCHELLE, NY 10801

C. Owner's Name: **City of New Rochelle, NY**

D. Architect: Element Architectural Group.
12 Route 17 North, Suite 220, Paramus NJ 07652
ph: 201 368-7752

1. Consultants:
a. Electrical/Plumbing: Greenman Pederson, Inc
400 Rella Blvd. Monetbello, NY 10901
ph: 845 368-4050

E. Summary of Work:

The scope of work for this project includes but is not necessarily limited to the following:

1. Selective Demolition of designated interior spaces and existing construction.
2. Demolition of existing Men's Toilet Room and renovation to create new ADA compliant Men's Room
3. New ADA compliant Women's Toilet Room.
4. Expand existing Lounge Area into Garage area.
5. New 8'-0" high screening wall at Locker Room.
6. Relocate existing locker units.
7. New hollow metal doors, frames and hardware.
8. Miscellaneous painting.
9. New suspended acoustic ceiling extension of existing suspended acoustic ceiling.
10. New epoxy floor finish in portion of garage area over existing slab.
11. Replacement of 2 existing windows.
12. Related Plumbing, Electrical and Mechanical work.

F. The General Contractor shall coordinate the work of other contractors or vendors engaged directly by the Owner.

1.02 OWNER OCCUPANCY

- A. Contractor shall coordinate and schedule their work with occupants using the building on a regular basis.
- B. The building shall be occupied by the Owner during the course of construction. The General Contractor shall coordinate its Work and the Work of subcontractors to accommodate the operational requirements of the Owner and shall establish the Construction Schedule accordingly.

1.03 HANDLING OF REGULATED MATERIALS

- A. Asbestos: The City of New Rochelle has performed an asbestos abatement at the project location.

- B. Lead Paint: This project is not considered a 'lead abatement project' by the State of New York, however, the possibility still exists that lead may be present in some of the existing paint materials scheduled to be demolished. For purposes of bidding, the contractor shall assume that they will encounter lead and/or lead-based materials on this project. As such, the contractor shall be prepared to conduct paint removal in such areas using 'lead-safe practices' as needed and such work shall be included in their base bid. These practices include the following:
1. Installation of plastic dust barriers and tarp ground coverings.
 2. Use of HEPA vacuum attachments on all applicable tools.
 3. Removal of lead-based materials in an intact state as much as possible.
 4. Demolition without grinding, sawing and drilling of materials containing lead.
 5. Wetting down of materials during removal process.
 6. Wiping down all surfaces with a damp cloth after removal.
 7. Cleaning all ground surfaces during clean up.

1.04 DEFINITIONS

For the purpose of establishing progress schedules and limitations to use of the site and the building and the project, the following definitions shall apply:

"Hours":- Hours must comply with City code, which states:

"All construction and demolition activity, excluding emergency work, shall not be performed between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, or between the hours of 6:00 p.m. and 9:00 a.m. on weekends and federal holidays, unless such activities have been presented to and approved by owner prior to the start of any work.

1.05 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings or as modified in agreement with the Owner in order to complete the Work.
- B. Provide all Work and site mobilization from staging areas as designated and agreed to by Owner Representative. Contractor responsible for all site cleanup throughout the day and restoration at the end of each work day as required until the completion of the project.
- C. Arrange use of site to allow:
1. The Owner intends to occupy the building while the Work is underway. The Work shall be scheduled and phased to accommodate the operations of the Owner while the Work is being performed.
 2. Owner occupancy and use of the areas of the site outside of the active designated work area.
 3. Use of site outside of the designated contractor's work area or contractor's staging area(s) by the public.
- D. Emergency Building Exits: Keep all exits from building open and unobstructed during construction. Provide temporary safety barriers, protection, exit signs if exit routes are temporarily altered.
- E. Utility Outages and Shutdown:
1. Disruption of utility services MUST be approved and coordinated with facility management prior to any disruption of service. A minimum of 7 calendar days prior notice shall be provided to the Owner
 2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 calendar days notice to Owner and authorities having jurisdiction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01300 ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pre-construction meeting.
- B. Site Mobilization Meeting.
- C. Progress meetings.
- D. Coordination drawings.
- E. Submittals for review, information, and project closeout.
- F. Submittal procedures.
- G. Excessive submittals

1.02 RELATED SECTIONS

- A. Section 01100 - Summary: description of the Work, Stages of the Work, Work covered by each contract, and occupancy.
- B. Section 01700 - Execution Requirements: Additional coordination requirements.
- C. Section 01780 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION

- A. Project Coordinator: General Contractor.
- B. The Project Coordinator shall be responsible for the allocation of mobilization areas of site; for field offices and sheds, for temporary offices, sheds, storage facilities, deliveries, removal, access, traffic, and parking facilities. The Project Coordinator shall be responsible for coordinating these activities as they may relate to the phases of the project.
- C. During construction, the Project Coordinator shall coordinate use of site and facilities.
- D. The building shall be occupied during the course of construction. The General Contractor shall coordinate its Work and the Work of subcontractors to accommodate the operational requirements of the Owner and shall establish the Construction Schedule accordingly.
- E. Project Coordinator shall establish procedures and responsibilities for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- F. The Project Coordinator shall coordinate field engineering and layout work.
- G. The General Contractor shall make the following types of submittals to the Architect and/or other parties as the provisions of the Contract Documents may require.
 - 1. Applications for required Construction Permits
 - 2. Requests for Interpretation. (RFI)
 - 3. Requests for substitution.
 - 4. Shop drawings, product data, and samples.

5. Test and inspection reports.
6. Design data.
7. Manufacturer's instructions and field reports.
8. Applications for payment and change order requests.
9. Progress schedules.
10. Coordination drawings.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRE-CONSTRUCTION MEETING

- A. Owner will schedule a meeting after Notice of Award.
- B. Attendance Required:
 1. Owner.
 2. Owner's Representative (Clerk of the Works or professional in similar capacity). Person responsible for administrative and management duties on behalf of the Owner during the course of the Project.
 3. Architect.
 4. Contractor: Prime Contractor and each Sub-prime Contractor.
- C. Agenda:
 1. Responsibilities of each party involved with the Project.
 2. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 3. Designation of personnel representing the parties in Contract, Owner, Owner's Representative, and the Architect.
 4. Review of the procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 5. Scheduling and Phasing of the work.
 6. Use of premises by Owner and Contractor.
 7. Owner's requirements.
 8. Construction facilities and controls provided by Owner.
 9. Temporary utilities provided by Owner.
 10. Survey and building layout, where required by project scope.
 11. Security and housekeeping procedures.
 12. Application for payment procedures.
 13. Procedures for testing.
 14. Procedures for maintaining record documents.
- E. Where directed by the Owner, the Architect shall record the pre-construction meeting minutes and distribute copies to all participants and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

- A. Owner will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 1. Contractor

2. Owner.
 3. Architect.
 4. Contractor's Superintendent.
 5. Sub-prime Contractors.
- C. Agenda:
1. Use of premises by Owner and Contractor.
 2. Owner's requirements and occupancy prior to completion.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Vehicular access requirements for the Owner and the Contractor.
- D. The Contractor shall record minutes and distribute copies within two business days after meeting to participants, with a copy to the Architect, the Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum semi-monthly intervals.
- B. Attendance Required: Prime Contractor's Project coordinator, Job superintendent for each Sub-prime Contractor, major Subcontractors and suppliers, Owner or Owner's Representative, Architect, as appropriate to agenda topics for each meeting.
- C. Agenda:
1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems which impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- D. The Contractor shall record minutes and distribute copies within two days after meeting to participants, with a copy to the Architect, the Owner, participants, and those affected by decisions made.

3.04 COORDINATION DRAWINGS

- A. Each Prime Contractor shall prepare, as a submittal, any additional drawings required for the coordination of different, interfacing aspects of the work.
- B. Review drawings prior to submission to Architect.

3.05 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
1. Product data.
 2. Shop drawings.

3. Samples for selection.
 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.

3.06 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Copies of the applicable portions of reference standards to permit review by the Architect to verify compliance with the Contract Documents.
 8. Other types indicated.
- B. Submit for the Architect's knowledge as contract administrator or for the Owner. No action will be taken.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
 2. Operation and maintenance data.
 3. Warranties.
 4. Bonds.
 5. Other types as indicated.
- B. Refer to Sections 01700 - Execution Requirements and 01780 - Closeout Submittals for additional closeout requirements.

3.08 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
1. PDF format.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates where required by Architect.
 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.09 SUBMITTAL PROCEDURES

- A. Transmit each submittal with AIA Form G810.
- B. Sequentially number the transmittal form. Assign a number to each submittal that shows the 6 digit number of the specification section for which the submittal is being made. Apply a 2 digit sequentially numbered suffix to the submittal. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

- D. Apply Contractor's stamp, signed and dated by an authorized representative, certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
 - 1. Submittals received without the Contractor's Stamp and Approval shall be rejected.
- E. Deliver submittals to Architect at business address.
- F. Schedule submittals to expedite the Project, and coordinate submission of related items.
- G. For each submittal for review, allow 10 business days excluding delivery time to and from the Contractor.
- H. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- I. Provide space for Contractor and Architect review stamps.
 - 1. Submittals will be marked by the Architect or his Consultants with one of four statements which will have language similar to the following.
 - a. "No Exceptions Noted" which indicates the submission may be used in conjunction with the Project.
 - b. "Corrections as Noted" which indicates the submission may be used in conjunction with the Project provided the reviewer's modifications on the submittal are incorporated into the Work as if they were part of the original submission.
 - c. "Revise and Resubmit" which indicates the submission, in its present form, may not be used in conjunction with the Project and the submittal must be corrected and resubmitted.
 - d. "Rejected" which indicates the submission may not be used in conjunction with the Project and does not comply with the Project Requirements. The contractor must submit a different item.
 - 2. Submission of a proposed substitution, if rejected, shall be considered as one submittal.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested or required by the construction documents will not be recognized or processed.

3.10 EXCESSIVE SUBMITTALS

- A. The Contractor is responsible for verifying that each submittal is complete, accurate, in compliance with the Project Requirements and presented in a manner which enables the Architect to determine compliance by referencing only the Drawings and/or Specifications.
- B. The Contractor will be responsible for delays in the Work and the Construction Schedule caused by submittals that are rejected due to failure to demonstrate compliance with the Project Requirements, incompleteness, failure of the Contractor to sign and approve the submittal, or any other legitimate reason.
- C. Submission of a proposed substitution, if rejected, shall be considered as one submittal of the two submissions permitted for each item.
- D. The Architect is responsible to review a submission of any particular item no more than two

times.

1. If, after a second submission of a particular submittal the item is still marked "rejected" or "revise and resubmit", the Architect and his Consultants will be entitled to charge the Owner for any time used to make further reviews of such submittals.
2. The Owner may pass along the costs for such additional submittals reviews, as charged by the Architect, to the Contractor. The Owner may also add to the Architect's fees any additional administrative costs it incurs in processing the payments.
 - a. The Owner shall invoice the Contractor for these costs and the Contractor shall render full payment within 10 business days of receipt of the invoice.
 - b. If the contractor fails to make payment in the allotted time, the Owner may either with hold the Contractor's next progress payment until the matter is resolved or deduct the amount from the next progress payment. Deductions from progress payments will be formalized by a change order to the contract

END OF SECTION

SECTION 01400 QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance submittals.
- B. Mock-ups, where required by a specific Section.
- C. Control of installation.
- D. Tolerances.
- E. Testing and inspection and Testing services where required by a specific Section..
- F. Manufacturers' field services where required by a specific Section..

1.02 RELATED SECTIONS

- A. Section 01425 - Reference Standards.
- B. Section 01600 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCES

- A. ASTM C 1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants.
- B. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- C. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing.
- D. ASTM E 548 - Standard Guide for General Criteria used for Evaluating Laboratory Competence.

1.04 SUBMITTALS

- A. Testing Agency Qualifications: for agencies employed by parties other than the Owner.
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor. This requirement applies to testing, inspections or certifications to be performed by the Owner's testing agency or testing agency employed by the contractor or manufacturer.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.

- d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
2. Test reports are submitted for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 10 calendar days of observation to Architect for information.
 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 TESTING AND INSPECTION AGENCIES

- A. Except where the responsibility is assigned to others, the Owner will employ and pay for services of an independent testing agency to perform certain on-site specified testing and inspection.
- B. Tests and certifications to be performed off-site, as required by the Specifications, for materials, assemblies or products to be incorporated in this Project shall be the responsibility of the contractor and/or manufacturer of the items. Cost for such testing shall be included in the contractor's Base Bid.
- C. Engineering services for specific products or assemblies as required by the Specifications shall be the responsibility of the contractor and/or manufacturer of the items. Cost for such services shall be included in the contractor's Base Bid.
- D. Employment of agency, by any party, in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- E. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 548, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM C 1021.
 2. Inspection agency: Comply with requirements of ASTM D290.
 3. Laboratory: Authorized to operate in State in which Project is located.
 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

5. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Refer to the provisions of Part 1 of this Section to determine who is responsible for each test and inspection.
- C. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests and inspections required by Architect.
 - 7. Attend pre-construction meetings and progress meetings when critical issues concerning the quality of the work must be resolved.
 - 8. Submit reports of all tests/inspections specified.
- D. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Except for an agency employed by the Owner that is expressly granted such powers, a testing inspection agency has no authority to stop the Work.
 - a. The Owner shall notify the other parties, in writing, of the identity of any agency empowered to stop the Work or to modify the methods being used by the contractor or his agents.
- E. Contractor Responsibilities:
 - 1. Advise the Owner, according to the progress of the Work, regarding when testing and inspecting will be required.
 - a. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by or the Owner. Payment for re testing will be charged to the by deducting testing charges from the Contract.
 - 2. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 - 3. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 4. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 5. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 6. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 7. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 8. Promptly correct or replace Work judged to be non-complying as a result of a test and/or inspection

- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and to perform inspections or provide certifications, as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect, 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace, as soon as possible, Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.
 - 1. Adjustments in payment or to the completion date for the Project or Phase of the Project thereof, shall be formalized by a Change Order.
- C. Compensate Owner for any additional costs incurred or damages caused, including additional Architectural or Engineering services, to remedy defects in the Work.
 - 1. Payment shall be made directly to the Owner.
 - 2. Owner may withhold an equivalent sum of money from a contractor's application for payment until payment is tendered to the Owner.

END OF SECTION

SECTION 01425

REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.
- B. Reference standards full title and edition date.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue specified in the individual specification sections, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
- B. AAMA 1503.1 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site.

2.02 AFPA -- AMERICAN FOREST AND PAPER ASSOCIATION

- A. AFPA WFCD No.1 - Manual for Wood Frame Construction.

2.03 ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE

- A. ANSI A250.6 - Hardware on Standard Steel Doors (Reinforcement--Application).
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.
- C. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test.

2.04 ASTM -- AMERICAN SOCIETY FOR TESTING AND MATERIALS

- A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- B. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- C. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- E. ASTM A 185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- F. ASTM A 591/A 591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Weight (Mass) Applications.
- G. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- I. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- J. ASTM C 28/C 28M - Standard Specification for Gypsum Plasters.
- K. ASTM C 33 - Standard Specification for Concrete Aggregates.
- L. ASTM C 35 - Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster.
- M. ASTM C 36/C 36M - Standard Specification for Gypsum Wallboard.
- N. ASTM C 62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale).
- O. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- P. ASTM C 79 - Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board.
- Q. ASTM C 91 - Standard Specification for Masonry Cement.
- R. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
- S. ASTM C 150 - Standard Specification for Portland Cement.

- T. ASTM C 171 - Standard Specification for Sheet Materials for Curing Concrete.
- U. ASTM C 206 - Standard Specification for Finishing Hydrated Lime.
- V. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
- W. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale).
- X. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- Y. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
- Z. ASTM C 330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
- AA. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout.
- AB. ASTM C 475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- AC. ASTM C 476 - Standard Specification for Grout for Masonry.
- AD. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.
- AE. ASTM C 514 - Standard Specification for Nails for the Application of Gypsum Board.
- AF. ASTM C 557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- AG. ASTM C 587 - Standard Specification for Gypsum Veneer Plaster.
- AH. ASTM C 588/C 588M - Standard Specification for Gypsum Base for Veneer Plasters.
- AI. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
- AJ. ASTM C 630/C 630M - Standard Specification for Water-Resistant Gypsum Backing Board.
- AK. ASTM C 631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering.
- AL. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- AM. ASTM C 636/C 630M - Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- AN. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members.
- AO. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- AP. ASTM C 834 - Standard Specification for Latex Sealants.
- AQ. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board.
- AR. ASTM C 842 - Standard Specification for Application of Interior Gypsum Plaster.

- AS. ASTM C 843 - Standard Specification for Application of Gypsum Veneer Plaster.
- AT. ASTM C 844 - Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster.
- AU. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- AV. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications.
- AW. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- AX. ASTM C 955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
- AY. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
- B. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- BA. ASTM C 1036 - Standard Specification for Flat Glass.
- BB. ASTM C 1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base.
- BC. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
- BD. ASTM C 1193 - Standard Guide for Use of Joint Sealants.
- BE. ASTM C 1364 - Standard Specification for Architectural Cast Stone.
- BF. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- BG. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m<sup>3- BH. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- BI. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m<sup>3- BJ. ASTM D 1667 - Standard Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
- BK. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- BL. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- BM. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).</sup></sup>

- BN. ASTM D 2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- BO. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- BP. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- BQ. ASTM D 3597 - Standard Specification for Woven Upholstery Fabrics--Plain, Tufted, or Flocked.
- BR. ASTM D 4637 - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
- BS. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- BT. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- BU. ASTM E 336 - Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.
- BV. ASTM E 413 - Classification for Rating Sound Insulation.
- BW. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.
- BX. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- BY. ASTM E 662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- C. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units.
- CA. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units.
- CB. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products.
- CC. ASTM E 1352 - Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies.
- CD. ASTM E 1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems.
- CE. ASTM E 1537 - Standard Test Method for Fire Testing of Upholstered Furniture.
- CF. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- CG. ASTM F 1066 - Standard Specification for Vinyl Composition Floor Tile.
- CH. ASTM F 1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.

2.05 AWWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

- A. AWWPA C1 – All Timber Products -- Preservative Treatment by Pressure Processes.
- B. AWWPA C20 - Structural Lumber -- Fire-Retardant Treatment by Pressure Processes.
- C. AWWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes.

2.06 FM -- FACTORY MUTUAL RESEARCH CORPORATION

- A. FM DS 1-28 - Insulated Steel Deck Construction.
- B. FM P7825 - Approval Guide; current edition.

2.07 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION

- A. NFPA 10 - Standard for Portable Fire Extinguishers.
- B. NFPA 70 - National Electrical Code.
- C. NFPA 72 - National Fire Alarm Code.
- D. NFPA 80 - Standard for Fire Doors and Fire Windows.
- E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- F. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- G. NFPA 261 - Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes; National Fire Protection Association.
- H. NFPA 266 - Standard Method of Test for Fire Characteristics of Upholstered Furniture Exposed to Flaming Ignition Source; National Fire Protection Association.

2.08 UL -- UNDERWRITERS LABORATORIES INC.

- A. UL (BMD) - Building Materials Directory; current edition.
- B. UL (FPED) - Fire Protection Equipment Directory; current edition.
- C. UL (FRD) - Fire Resistance Directory; current edition.
- D. UL (RMSD) - Roofing Materials and Systems Directory; current edition.
- E. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

2.22 WWPAA -- WESTERN WOOD PRODUCTS ASSOCIATION

- A. WWPAA G-5 - Western Lumber Grading Rules.

PART 3 US GOVERNMENT AND RELATED AGENCIES DOCUMENTS

3.01 COE -- CORPS OF ENGINEERS, U.S. ARMY

- A. COE CRD-C 513 - COE Specifications for Rubber Waterstops.

3.02 PS - PRODUCT STANDARDS

- A. PS 1 - Construction and Industrial Plywood.
- B. PS 20 - American Softwood Lumber Standard.

END OF SECTION

SECTION 01450 CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes administrative and procedural requirements for cutting and patching as required by the Work indicated on the Contract Documents and, where not indicated on the Contract documents but as required by the nature of the Work to produce the intended results of the Project.

1.02 DEFINITIONS

- A. Cutting and Patching is defined as the work necessary to incorporate the new Work of the Project with the existing building and/or site.
- B. Cutting and Patching shall use any materials which are necessary to achieve incorporation of the new work with the existing conditions and, except where otherwise noted or impractical in terms of current building methodologies, shall use materials which are the same as those being cut and patched.
- C. Cutting and Patching includes reconstruction of portions of the building as may be required to make transitions between new Work and the existing construction.
- D. Cutting and Patching, shall, by its nature, involve demolition, removals, and salvaging of existing materials for reuse and reinstallation regardless of whether same are indicated in the Construction Documents.
- E. Cutting and Patching shall include, but not be limited to, General Construction work, limited Structural work, Plumbing work, Mechanical work and Electrical work.

1.03 DESCRIPTION AND APPLICATION - SINGLE PRIME CONTRACT

- A. The work of this Project includes the renovation of an existing building and, as such, will require Cutting and Patching in order to execute the Work.
- B. Cutting and Patching is implied by the nature of the Work and, in general, is not specifically identified on the Drawings or described in other sections of the Specifications.
- C. The Contractor is responsible for any and all Cutting and or Patching which may be required to execute the intent of the Construction Documents.
 - 1. Perform Cutting and Patching as the conditions of the Work require whether or not the Construction Documents indicate Cutting and Patching.
 - 2. Except where otherwise noted, perform Cutting and Patching to incorporate the new work with the existing construction such that, when completed, the transition between the new work and the existing construction is not visually and tactually perceptible.
 - 3. Perform Cutting and Patching using the appropriate methods and materials; employing the appropriate skilled labor and techniques as each situation may require.
 - 4. Maintain the structural integrity of the existing construction which shall remain after the completion of the Work.
 - 5. Maintain existing Plumbing, Mechanical, Electrical, security, fire protection, communication, and other similar systems which are to remain in effect after the

- completion of the Work.
 - 6. Restore, to original or better condition, any existing Plumbing, Mechanical, Electrical, security, fire protection, communication, and other similar systems which are affected by the activities of the Work.
 - 7. Restore, to original or better condition, any existing construction, finishes, structural elements or other components of the building which are affected by the activities of the Work.
 - 8. Perform any refinishing, painting, coating, or similar surface treatment as required to produce an indistinguishable transition between the new Work and the existing construction.
- D. Salvage and Preservation:
- 1. An express goal of this Project to minimize the impact of the new Work upon the existing building.
 - 2. Where practical, and where not prohibited by the construction documents, building code, or good practice, existing components, which are not readily replaced and which are suitable for reuses, shall be carefully removed, salvaged, suitably stored and, at the appropriate time, reinstalled.
 - a. Items which the Owner wishes to save shall be carefully removed and protected and stored in a location, on site, as directed by the Owner.
 - 3. Items which the Owner does not wish to save shall be legally disposed.
 - 4. Unique or irreplaceable components of the existing building or site which are not to be used in the new work shall, prior to commencing the Work, be identified, listed and presented to the Owner for response.

1.04 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
- C. Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.
 - 1. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
- D. Section 02223 – Selective Demolition: coordination of demolition with the new Work and the integration of Cutting and Patching with the requirements of the new Work
- E. Requirements of this Section apply to mechanical and electrical installations. Refer to Divisions 22, 23 and 26 for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 3. List products to be used and firms or entities that will perform Work.
 4. Indicate dates when cutting and patching will be performed.
 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
 7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.
- C. Materials and Products
1. Materials and Products as may be listed herein are not inclusive of all the materials required to execute the Cutting and Patching required for this project
 2. Provide whatever materials and products that are necessary for the execution of the Cutting and Patching work whether or not such materials and products are included in any of the Section of the Project Specifications.
 3. Where products or materials are specified in the Project Specifications provide items which comply with the specifications, otherwise provide products and materials of the quality and type which are appropriate for each specific cutting and patching condition.
 4. Except for materials and products submitted and accepted pursuant to other sections of these specifications, furnish the following:
 - a. Product Data: Provide data on plaster materials, characteristics, and limitations of products specified.
 - b. Samples: Where required by the Architect based upon the nature of the cutting and patching condition, submit three samples, 6 x 6 inch in size illustrating finish color and texture.
 5. Shop Drawings:
 - a. Where required by the Architect based upon the nature of the cutting and patching condition, furnish detailed shop drawing indicating the proposed work incorporating the affected existing conditions.
 - b. Include field measurements of existing conditions and those of the related new construction. Include photographs of conditions which cannot be adequately described by other means.
- D. Project Record Documents: Record actual locations of Cutting and Patching and include in the record drawings required for Project Closeout.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing any portion of the cutting and patching work with minimum 5 years of experience.
- B. Plumbing, Mechanical and Electrical work shall be designed under the direct supervision of a Professional Engineer experienced in design of this Work and licensed in the state of New York.
- C. Design Structural Work under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the state of New York.
1. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
 2. Obtain approval of the cutting and patching proposal before cutting and patching the

following structural elements:

- a. Foundation construction.
- b. Structural concrete
- c. Structural steel.
- d. Lintels.
- e. Timber and primary wood framing.
- f. Structural decking.
- g. Miscellaneous structural metals.
- h. Equipment supports.
- i. Piping, ductwork, vessels, and equipment.

D. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment
 - b. Air or smoke barriers.
 - c. Water, moisture, or vapor barriers.
 - d. Membranes and flashings.
 - e. Fire protection systems
 - f. Noise and vibration control elements and systems.
 - g. Control systems.
 - h. Communication systems.
 - i. Electrical wiring systems.

E. Visual Requirements: Do not cut and patch construction exposed on the exterior or the interior occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner as determined by the Architect.

1. If possible retain the original Installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original Installer or fabricator, engage another recognized experienced and specialized firm.
 - a. Processed concrete finishes.
 - b. Stonework and stone masonry.
 - c. Ornamental metal.
 - d. Matched-veneer woodwork.
 - e. Firestopping
 - f. Window wall system.
 - g. Stucco and ornamental plaster.
 - h. Acoustical ceilings.
 - i. Finished wood flooring.
 - j. Fluid-applied flooring.
 - k. Carpeting.
 - l. Aggregate wall coating
 - m. Wall covering.
 - n. HVAC enclosures, cabinets, or covers.

F. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

G. Engineered work or systems designed by the Contractor's engineer(s) shall be reviewed for coordination and compliance by the Engineer of record for the Project.

1.07 MOCK-UP

- A. Not required

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion, except where other, superceding warranties apply.
- C. Perform work in a manner which shall not void, diminish or compromise any warranties associated with this project or which pre-existed this project.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.
- B. Some materials and products are mentioned in this section since they are common to typical patching applications. Other materials and products may be required to perform patching work. The fact that certain patching materials or products are not indicated within this section does not, in any way, preclude the use of such materials where conditions require.
- C. Plaster: Comply with ASTM C 842
 - 1. Base Coat: Ready-mixed, sand aggregate gypsum plaster base
 - 2. Finish Coat: Ready-mixed gypsum finish plaster.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
 - 1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining

areas.

- D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 INSTALLATION

- A. When using products or materials which are not specified in the Specifications, prepare and install in accordance with manufacturer's instructions.
- B. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- C. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.
 - 1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
 - 4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.
 - 5. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- D. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.
 - 4. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
- E. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.
 - 1. Unless otherwise indicated, provide 3-coat work.
 - 2. Finish gypsum plaster to match existing adjacent surfaces. Sand lightly to remove trowel marks and arises.

3. Cut, patch, point-up, and repair plaster to accommodate other construction.

3.04 CLEANING AND PROTECTION

- A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition
- B. Protect patched areas in the same manner as for new work of an equivalent type.
- C. Do not permit traffic over unprotected floor surface.

END OF SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities.
- B. Temporary Communication to the job site
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Field offices.

1.02 TEMPORARY UTILITIES

- A. Provide the following:
 - 1. Provide for all electrical power and lighting. Existing power and lighting available in the building may be used. Where power sources or lighting is required for the Work are not available in the building, provide temporary power via generator or other appropriate source and provide temporary lighting as required to maintain the Owner continued occupation of the Work area.
 - a. Maintain existing emergency lighting and illuminated exit signs. Where existing emergency lights and exit signs are disabled during the course of the work, provide temporary facilities until existing or new facilities are operational.
 - 2. Water may be obtained from existing services on site. Provide modifications of existing facilities where necessary to serve the needs of construction operations.
 - a. Restore water service utilities to original condition or better condition at the completion of the Work.
- B. The building shall be occupied during the course of construction. The General Contractor shall coordinate its Work and the Work of subcontractors to accommodate the operational requirements of the Owner and shall establish the Construction Schedule accordingly.
- C. Existing facilities may be used with limitations if permitted, in writing by the Owner. Contractor shall assume, when bidding, that no existing facilities other than water will be available.
- D. Remove all temporary facilities at the completion of the Work or sooner, where requirements of the work permit. Restore affected areas to original or better condition.

1.03 COMMUNICATION SERVICE

- A. Contractor shall establish a means of communication which shall allow the Owner, his representative and the Architect to communicate with the job site during periods when work is underway.
 - 1. A cellular phone may be used for this purpose.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
 - 1. Provide portable toilet facilities of the type and number as acceptable to the local Board of Health. At no time shall less than two portable units be present at the job site.
 - 2. Have units serviced weekly or sooner as usage may require.
 - 3. Locate portable toilets within a fenced or secure area and to be convenient to the areas subject to work
 - 4. Locate containers within protected Work Area.
 - 5. Coordinate with Owner locations for dumpsters.

1.10 FIELD OFFICES

- A. At the contractor's option, a single field office may be located within the work area. Coordinate location with Owner.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.
 - 1. Set portable toilet on level grade and away from areas which collect rain water and away from vehicular traffic routes. Provide stabilizing anchors, chains, stakes to prevent tip over and to discourage vandalism.
- B. Use of existing facilities is not permitted.

1.02 BARRIERS

- A. Provide barriers and fencing to prevent unauthorized entry into construction area and to allow Owner to continue to use other areas adjacent to the Work Area, to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection for plants designated to remain. Replace damaged plants.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.03 FENCING (Not Used)

1.04 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Do not permit unauthorized persons within the protected Work Area.

- C. The Owner, its designated representatives, the Architect and his consultants shall be permitted access to the Work Area and the new building at any time.
- D. Coordinate with Owner's security program.

1.05 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Existing on-site roads may be used for construction traffic.
- E. A limited number of existing parking areas, as established by the Owner located at the Job site may be used for construction parking during the construction period.

1.06 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Dispose of waste off-site weekly or more frequently as project activities may dictate.
- C. Locate containers on stabilized earth or pavement to facilitate removal and replacement. Provide clear area around containers to facilitate access of vehicles servicing containers.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01565 SECURITY MEASURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Site security measures.

1.02 RELATED SECTIONS

- A. Section 01100 - Summary: Use of premises and occupancy.
- B. Section 01500 - Temporary Facilities and Controls: Temporary lighting, site fence, and barriers and enclosures.

1.03 SECURITY PROGRAM

- A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
- B. Initiate program at project mobilization and maintain program throughout construction period or until Owner acceptance precludes the need for Contractor security.

1.04 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workers and visitors, make available to Owner on request.
- D. Owner will control entrance of persons and vehicles related to Owner's operations.
- E. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.05 PERSONNEL IDENTIFICATION

- A. Each person who enters the jobsite and who is associated in any capacity with the work, shall, at all times, possess complete identification and any other security identification as the Owner may deem necessary.
 - 1. Each person at the jobsite shall produce identification when requested by the Owner, Owner's Representative, Architect or any other person the Owner authorizes to maintain security.
 - 2. Persons without proper identification shall immediately leave the jobsite.
 - 3. The contractor shall assign security duties to the Project superintendent or other responsible person(s) in his employ. The person in charge of security shall be on site at all times when any work is underway.
- B. The Project Superintendent shall maintain a daily record of the identification of workers for all contractors, subcontractors and other persons, under his control, who are associated with the project.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01600 PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Spare parts and maintenance materials.

1.02 RELATED SECTIONS

- A. Section 01400 - Quality Requirements: Product quality monitoring.

1.03 REFERENCES

- A. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 45 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated,

reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Do not use products having any of the following characteristics:
 - 1. Made using or containing CFC's or HCFC's.
- C. Provide interchangeable components of the same manufacture for components being replaced.
- D. Motors: Refer to Section 15065, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.
- E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS

- A. Products specified by reference standard or by description only:
 - 1. Use any Product meeting those specified standards or description.
- B. Products specified by naming two or more manufacturers and/or products with a provision for substitutions:
 - 1. Submit a request for substitution for any manufacturer or product not named.
- C. Products identified by "Basis of Design" shall establish the quality and performance criteria required for the project.
 - 1. Equivalent products that meet or exceed the quality and performance criteria of the Basis of Design may be submitted for review.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.02 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01700 EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Pre-installation meetings.
- D. Cleaning and protection.
- E. Starting of systems and equipment.
- F. Demonstration and instruction of Owner personnel.
- G. Closeout procedures, except payment procedures.

1.02 RELATED SECTIONS

- A. Section 01100 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01300 - Administrative Requirements: Submittals procedures.
- C. Section 01400 - Quality Requirements: Testing and inspection procedures.
- D. Section 01500 - Temporary Facilities and Controls: Temporary interior partitions.
- E. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- F. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

1.03 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
 - 1. Include in a submittal any specific execution requirements related to that submittal that will impact the incorporation of that submittal into the Work.

1.04 PROJECT CONDITIONS

- A. The building shall be occupied during the course of construction. The General Contractor shall coordinate the execution its Work and the Work of subcontractors to accommodate the operational requirements of the Owner and shall establish the Construction Schedule accordingly.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

- D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations both interior and exterior. Confirm with City of Pelham, NY, ordinances regulating noise.
- E. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work, infesting the site or any portion of the existing building and the addition constructed under any phase.
 - 1. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
 - 2. Where infestation of any kind is discovered, immediately notify Owner and advise him as to what steps will be immediately taken to eliminate the infestation and what periodic preventative means will be employed to prevent future infestations
 - 3. Submit a detailed plan for eliminating the infestation for review by the Owner. Follow procedures for submittals as found in Section 01300, Administrative Requirements.
 - 4. Do not use any chemicals to treat any infestation without obtaining the Owner's written approval
 - 5. Use only methods and materials, which have been submitted and accepted by the Owner.
- F. Lead Paint: This project is not considered a 'lead abatement project' by the State of New York, however, the possibility still exists that lead may be present in some of the existing paint materials scheduled to be demolished. For purposes of bidding, the contractor shall assume that they will encounter lead and/or lead-based materials on this project. As such, the contractor shall be prepared to conduct paint removal in such areas using 'lead-safe practices' as needed and such work shall be included in their base bid. These practices include the following:
 - 1. Installation of plastic dust barriers and tarp ground coverings.
 - 2. Use of HEPA vacuum attachments on all applicable tools.
 - 3. Removal of lead-based materials in an intact state as much as possible.
 - 4. Demolition without grinding, sawing and drilling of materials containing lead.
 - 5. Wetting down of materials during removal process.
 - 6. Wiping down all surfaces with a damp cloth after removal.
 - 7. Cleaning all ground surfaces during clean up.

1.05 COORDINATION

- A. See Section 01100 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of existing operating equipment. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. In all areas subject to new work, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction.
- F. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.
- C. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- D. Examine and verify specific conditions described in individual specification sections.
- E. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or improper fabrication.
- F. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- G. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PRE-INSTALLATION MEETINGS

- A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect five business days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of installation, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Re-Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and

- existing record documents only.
1. Verify that construction and utility arrangements are as shown.
 2. Report discrepancies to Architect before disturbing existing installation.
 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Separate areas in which alterations are being conducted from other areas that are still occupied.
1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01500 in locations indicated on drawings.
- C. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.
 2. Relocate items indicated on drawings.
 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, Alarm Systems and Security Systems): Remove, relocate, and extend existing systems to accommodate new construction.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 4. Verify that abandoned services serve only abandoned facilities.
 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- E. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
 4. Patch as specified for patching new work.
- F. Adapt existing work to fit new work:
- G. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
- H. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- I. Where a change of plane of 1/4 inch or more over 12'-0" of run or more for Architect review and request instructions.

- J. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- K. Refinish existing surfaces as indicated:
- L. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
- M. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
 - 1. Patch as specified for patching new work.
- N. Clean existing systems and equipment.
- O. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- P. Do not begin new construction in alterations areas before demolition is complete.
- Q. Comply with all other applicable requirements of this section.

3.05 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.06 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.07 STARTING SYSTEMS EXECUTION REQUIREMENTS

- A. Contractor shall coordinate schedule for re-start-up of various equipment and systems with their own mechanical/electrical sub-contractor.
- B. Notify Architect and owner four days prior to re-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, and for conditions that may cause damage during any disconnect or relocation.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and Wayne Township facilities representative.

3.08 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation to Owner's personnel two weeks prior to date of Substantial Completion.

3.09 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.10 FINAL CLEANING

- A. Execute final cleaning after Substantial Completion but before making final application for payment.
 - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- B. Use cleaning materials that are non-hazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
 - 1. Perform all final cleaning, polishing, conditioning and similar procedures as indicated in individual. Sections of finish materials.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean reusable filters of operating equipment; replace throw-away type filters.
- F. Clean debris from roofs, gutters, downspouts, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- I. Clean Owner-occupied areas of work.

3.11 CLOSEOUT PROCEDURES

- A. Make submittals for Substantial Completion of the project that are required by governing or

- other authorities.
1. Provide copies to Architect and Owner.
- B. Notify Architect when work is considered substantially complete
- C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
1. Submit a detailed punch list of any unfinished or unacceptable work, if any, at the point of Substantial Completion to be reviewed by the Architect and Owner. This list, and any amendments made by the Architect or Owner, shall be included in the Certificate of Substantial Completion.
- D. Owner will occupy portions of the building as specified in Section 01100.
- E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- F. Accompany Architect and Owner's Representative on preliminary final inspection.
- G. Notify Architect and Owner when work is considered finally complete.
1. The Architect, Owner and any other parties having jurisdiction shall inspect the completed work and, if necessary prepare a list of uncompleted or unacceptable Work
- H. Complete items of work determined by Architect's final inspection.
1. The Architect, Owner and any other parties having jurisdiction shall re-inspect the completed work and, if necessary prepare a list of uncompleted or unacceptable Work
 2. Should any additional inspections be required by the Architect, the Architect shall, as additional services, invoice the cost of the inspections and associated reports or lists to the Owner. The Owner shall pass along those costs to the contractor and deduct same, along with any other costs associated with the contractor's failure to complete the Work after the aforementioned inspection procedure, from the final payment due the contractor.
 - a. These costs shall be administrated according to the provisions of the General and Supplementary Conditions

END OF SECTION

SECTION 01780 CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.
- D. Submittals

1.02 RELATED SECTIONS

- A. Conditions of the Contract: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, schedules, product data, and samples.
- C. Section 01700 - Execution Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 CLOSEOUT PROCEDURES

- A. When Substantial Completion is attained for the Project:
 - 1. All Closeout requirements shall be satisfied.
 - 2. A Certificate of Occupancy and any other governmental approvals which are necessary to permit the Owner full use of the entire Project shall be obtained upon the completion of the Project.
 - 3. Retainage: Retainage shall only be released at the Final Completion of the Project, unless the Owner agrees otherwise.

1.04 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect a minimum of 15 days prior to the submission of the Application for final Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment for that Phase.
3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.
4. Maintenance Bond
 - a. Submit a Maintenance Bond from a surety which is empowered to do business in the State of New Jersey.
 - b. Bond Value: refer to the Township of Wayne's front end requirements for bond percentage.
 - c. Bond shall be effective on date of Final Completion or Final Payment, whichever occurs first and shall be effective for a minimum of one year.
 - d. The bond shall guarantee that should the contractor fail to satisfy any legitimate claim regarding warranties, guarantees or other defective work within 30 calendar days of written notice by the Owner, the surety shall satisfy the claim up to the value of the bond.
 - e. The issuance of a Maintenance Bond shall in no way supersede or replace responsibilities of the contractor and its surety to satisfy claims by the Owner made subsequent to Final Completion.

D. Contractor Submittals

1. Release of Lien: Submit a release of lien for the prime contractor, each sub-prime contractor and every other subcontractor who performed work on the Project. Submit a release of lien for any other party as the Owner may require.
 - a. A release of lien shall be a separate instrument for one contracting party and shall be unconditional.
 - 1) The release shall not be conditional or dependent upon payment or any other act by the Owner or other party.
 - b. Contractors or subcontractors shall submit a release of lien for every Phase of the Work in which they performed work.
 - c. The prime contractor, each sub-prime contractor and every other subcontractor who performed work shall furnish a release of lien.
2. Contractor's Affidavit of Payment of Debts and Claims: Submit AIA Document G706 for each prime contractor and sub-prime contractor.
 - a. The prime contractor, each sub-prime contractor and every other subcontractor who performed work shall, furnish an affidavit.
3. Architect Final Inspection List: At the completion of the Work, the prime contractor and each sub-prime contractor shall submit a copy of the Architect's Final Inspection List and certify in writing that all items on the list have been satisfied.
4. Final Accounting Statement: Submit a final accounting statement indicating the Original Contract Sum and all change orders, construction change directives, liquidated damages (where applicable), retain ages and other documents which affected the cost or completion date of the Project.
 - a. Include copies of all documents, arranged chronologically by prime contract.
 - b. Liquidated Damages: where applicable, submit final accounting of liquidated damages.
5. Contractor's Debts to Others: Show proof that all monies due the Owner or its consultants for services, fees, penalties or other costs incurred during course of the work have been satisfied.
6. Consent of Surety for Final Payment: Submit a separate document from the issuing surety for each party for which separate bonds were obtained for the Project.
7. Insurance: Submit proof of continuing insurance coverage for all contractors through Final

Completion.

- a. In situation where the insurance certificates are effective for a limited period of time, provide proof of continuing insurance coverage at regular intervals during the course of the Project. The intervals shall correspond with the effective periods on the certificates.
8. Submit any other documents or proofs as the Owner may require.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 1. Field changes of dimension and detail.
 2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 1. Product data, with catalog number, size, composition, and color and texture designations.

- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Manufacturer's printed data, PDF format.
- D. Drawings: Provide PDF scanned files, actual paper size.
- E. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Project documents and certificates, including the following:
 - a. Shop drawings, approved submittals and product data.
 - b. Certificates.
 - d. PDF copies of warranties and bonds.
- F. Provide a listing in Table of Contents.
- G. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.05 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of

Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 022230 SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal of designated building equipment and fixtures.
- B. Removal of designated construction.
- C. Disposal of materials.
- D. Identification of utilities.
- E. By definition, for the purposes of this Section, "Demolition" shall include work described as "Removals", "Removal and Salvage" and may include cutting and patching as described in another Section.

1.02 RELATED SECTIONS

- A. Section 01100 - Summary: Work sequence, continued occupancy of the building and handling of regulated materials.
- B. Section 01450 - Cutting and Patching
- C. Section 01500 - Temporary Facilities and Controls: Temporary enclosures.
- D. Section 01700 - Execution Requirements: Re-installation of removed components.
- E. Section 01780 - Closeout Submittals: Project record documents.

1.03 DEMOLITION PLANS

- A. The Demolition Plan(s) included in the Drawings shows only the general extent of the demolition required for the Project. Additional demolition and removals, not specifically indicated on the construction documents may be necessary for the proper execution of the Work and shall be assumed to be included in the Work of this Section.
- B. Prior to proceeding with any demolition, review the Demolition Plan comparing it to the new Work indicated in the other Contract Documents to ascertain the specific extent and nature of the demolition.
 - 1. Determine the need for temporary shoring, bracing or other form of stabilization which may be necessary to support the remaining structure until new work is installed or until work of future Phases of the project are completed.
 - 2. Determine the relationship of the new work to the demolition to ascertain where new structural support or reinforcement may be required to accommodate the new work and which is necessary to support the existing structure to remain.
 - 3. Determine the relationship of existing Plumbing, HVAC, Electrical, Communications and Security systems to the requirements of the new work to ascertain what portions of the existing system must be maintained for incorporation into the new work. Review, where applicable, demolition drawings for the Plumbing, HVAC and Electrical Work and refer to notes regarding demolition which may be contained in the Drawings or Specifications

- C. Coordinate the demolition work required for each stage of the Project with the requirements for future stages in order to identify the extent of the demolition for each stage.
 - 1. Provide temporary support or other provisions to maintain the integrity of the existing structure until the work of future phases is complete.
- D. Contractor to retain mechanical vendor to disconnect, reconnect and test all equipment located on roofs related to the scope of work. The Township shall be notified in advance, minimum 4 days of any work required on equipment, (Shut downs, testing, restarts, etc.). Contractor and/or vendor shall NOT disconnect, shut down any equipment without the approval of the Township.

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate demolition, removal sequence, and location of salvageable items; location and construction of temporary facilities.
 - 1. Failure to provide a Demolition Shop Drawing shall not relieve the contractor of compliance with the project requirements.
- C. Project Record Documents: Accurately record actual locations of capped utilities.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for demolition work, dust control, products requiring electrical disconnection and reconnection, and mechanical (HVAC and plumbing) equipment requiring disconnection and reconnection.
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress from any building exit or site exit.
- D. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.
- E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.
 - 1. In buildings where Asbestos Containing Materials (ACM) have been identified, review the Owner's documents and coordinate work according such that no ACM is disturbed during the course of demolition.
 - 2. Where asbestos abatement is to be performed as part of this project, coordinate the scheduling of the demolition work so that the asbestos abatement work has been completed prior to the commencement of the demolition work.
 - 3. Follow provisions of the specifications and applicable laws regarding asbestos and lead paint if these materials are encountered.

1.06 SEQUENCING

- A. Sequence work under the applicable provisions of Section 01100.
- B. In areas of the building which are currently in use, perform demolition immediately prior to the time when new work is scheduled thereby permitting the Owner the maximum time to use the existing portions of the building.
- C. Coordinate planned sequence of the demolition with the Owner's Asbestos Abatement Plan.

1.07 SCHEDULING

- A. Schedule work under the provisions provided by the City of New Rochelle.
- B. Schedule work to coincide with new construction.
- C. Schedule work to permit the Owner access to and use of all part of the existing building up to the time where the Project Schedule indicates that new work shall commence.
- D. Describe demolition removal procedures and schedule.
- E. Perform noisy, malodorous, or dusty work which is deemed disruptive to the operation of the occupied portions of the building:
 - 1. "OFF Hours" unless other arrangements are approved, in writing, by the Owner's Representative.
 - a. Comply with the provisions for work outside of "OFF Hours" as described in Section 01100 Summary.
 - b. Do not perform such work during periods of after school or evening activities, unless permitted, in writing, by the Owner's Representative.
 - c. Obtain, from the Owner's Representative, the school's schedule of such activities and schedule the demolition accordingly.

1.08 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if, in the opinion of the Owner's Representative, the work is disruptive to, or in conflict with the use of the occupied portions of the building.
- C. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Provide, erect, and maintain temporary barriers at locations indicated and at other locations as may be required to isolate the area of demolition and allow the balance of the building to be used by the Owner.
- B. Erect and maintain weatherproof closures for exterior openings.
- C. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued building occupancy.
- D. Protect existing construction, finishes, plumbing, mechanical, electrical, communication, fire detection and other building systems that are not to be demolished.
 - 1. Where demolition disrupts the operation of an essential safety related building systems (communications, fire detection, security, emergency lighting, etc.) provide temporary means to maintain the operation of the system until the operation of the system(s) is

restored.

- E. Prevent movement of structure; provide bracing and shoring.
- F. Notify affected utility companies before starting work and comply with their requirements.
- G. Mark location and termination of utilities.
- H. Provide appropriate temporary signage including signage for exit or building egress.

3.02 DEMOLITION

- A. Disconnect, remove or cap as indicated on the drawings, and identify designated utilities within demolition areas.
 - 1. Where existing utilities are not identified on the drawings as being capped or removed, terminate or relocate same in a code complying manner as required to accommodate the new work.
- B. Demolish in an orderly and careful manner. Protect existing supporting structural members and maintain the structural integrity of all structure which shall remain.
- C. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- D. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.
- E. Remove temporary facilities.

3.03 SCHEDULES

- A. Remove, store and protect the following materials and equipment:
 - 1. Items identified on the drawings or on schedules.
- B. Remove the following equipment and materials for Owner's retention. Deliver to location designated by City of New Rochelle Representative.
 - 1. Items identified on the drawings or schedules to be removed or salvaged and returned to the Owner.
- C. Owner will remove and keep the following material and equipment:
 - 1. Existing unfixed furniture, furnishings, wall mounted items, furnishings, unfixed finish materials and similar items.
- D. Protect the following materials and equipment to remain in place:
 - 1. Items identified as to remain in place, or if not so identified, which, in their existing condition, do not conflict with the new work.

END OF SECTION

SECTION 055000 METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bollards; interior

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 099000 – Paints and Coatings: Primer and paint finish.

1.03 REFERENCE STANDARDS

- A. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- B. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015 (with March 2016 Errata).
- J. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2008.

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.
- C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- D. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.

- B. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing..
- C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by intermittent welds and plastic filler.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

- A. Bollards: Interior; as indicated on the Drawings. Fill bollards with 3,000 psi concrete and form top with smooth rounded convex surface; prime and paint finish.
 - 1. Bollards to be located as directed within the building.

2.05 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: Two coats.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft (530 g/sq m) galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
- C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
- D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
- E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 061000 ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dimensional lumber.
- B. Preservative treatment of wood.
- C. Miscellaneous framing, shims, battens, blocking and sheathing.

1.02 RELATED SECTIONS

1.03 REFERENCES

- A. AFPA WCD 1 T11 - Manual for Wood Frame Construction; American Forest and Paper Association.
- B. AWWA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association.
- C. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce).
- D. SPIB (GR) - Standard Grading Rules for Southern Pine Lumber; Southern Pine Inspection Bureau, Inc..

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials, and application instructions.
- C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
- B. Exposed-to-View Rough Carpentry: Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings.
- C. Moisture Content: Kiln-dry or MC15.
- D. Specie and Grade: No. 2 Select Structural or Dense Select Structural, Southern Yellow Pine; preservative treated.
- E. Miscellaneous Blocking, Furring, and Nailers; preservative treated.
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.02 EXPOSED DIMENSION LUMBER

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings.
- C. Moisture Content: Kiln-dry or MC15.
- D. Specie and Grade: For all other exposed applications No. 2 Select Structural or Dense Select Structural, Southern Yellow Pine; preservative treated.

2.03 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: Hot-dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
- B. Joist Hangers and other metal anchors or connection devices: Hot dipped galvanized steel, sized to suit framing conditions. Provide recommended devices manufactured by Simpson or equal.

2.04 FACTORY WOOD TREATMENT

- A. Pressure Treatment of Lumber Above Grade: AWWA Treatment C2 using waterborne preservative to 0.25 lb/cu ft retention.
 - 1. Kiln dry after treatment to maximum moisture content of 15 percent.
 - 2. Treat all wood to be used in an exterior environment.
 - 3. Treat wood in contact with masonry or concrete.
 - 4. Treat wood less than 18 inches above grade.
 - 5. Treat wood in contact with grade.
- B. Pressure Treatment of Lumber in Contact with Soil: AWWA Treatment C2 using waterborne preservative designated in AWWA C2 as suitable for ground contact use to 0.4 lb/cu ft retention.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Set wood members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance or application.

- B. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA WCD 1 T11.
- C. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items and trim.

3.02 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.03 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane (Other than Floors or Walkways): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

END OF SECTION

SECTION 064100

ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Custom fabricated cabinet units.
- B. Countertops; plastic laminate, solid surface.
- C. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 092210 - Non-Structural Metal Framing; support for casework.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- B. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- D. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; 2011.

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories. Coordinate with plumbing fixtures and electrical work.
 - 1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 2. Include certification program label.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.05 QUALITY ASSURANCE

- A. See Section 01400 – Quality Requirements for other quality project requirements.
- B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- C. Quality Certification:
 - 1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
 - 2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 3. Provide designated labels on shop drawings as required by certification program.
 - 4. Provide designated labels on installed products as required by certification program.
 - 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
 - 6. Replace, repair, or rework all work for which certification is refused.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Plastic Laminate Faced Cabinets: Custom grade.
- C. Cabinets:
 - 1. Cabinet Design Series: As indicated on drawings.
 - 2. Shelf Loading: 50 lbs. per sq. ft.
 - a. Deflection: 1/360.
 - 3. Cabinet Style: Flush overlay.
 - 4. Cabinet Doors and Drawer Fronts: Flush style.
 - 5. Drawer Side Construction: Multiple-dovetailed.
 - 6. Drawer Construction Technique: Dovetail joints.
- D. Adjustable Shelves.
 - 1. Inside Cabinets: Plastic laminate top and bottom on 3/4" thick substrate with 1/2" (13 mm) thick solid hard wood edge band with clear finish.

2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Lumber: Sizes and Grades - Size references surfaced four sides (s4s), unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which product is produced. B.
 - 1. Millwork, standing and running trim, and rails: actual size as shown or specified.
 - 2. Softwood Plywood: Concealed use APA-BB-Exposure I with exterior glue. Comply with PS-1 "Construction and Industrial Plywood".
 - 3. Particle Board Substrate for Laminate Surface: High density industrial grade, minimum density of 45 pcf., Formaldehyde-free.
 - 4. MDF thickness as specified, formaldehyde free, internal bond 90 psi, screw holding power of 325 pounds and internal density of 50 pcf.
- C. Plywood
 - 1. Softwood plywood: each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark shall identify the plywood by species group or identification index, and shall show glue type, grade, and compliance with PS1.
 - 2. Plywood, 13 mm (1/2 inch) and thicker; not less than five ply construction, except 32 mm (1-1/4 inch) thick plywood not less than seven ply.
 - 3. Plastic laminate plywood cores: Exterior type, and species group. Veneer grade: a-c.
 - 4. Shelving plywood: Interior type, any species group. Veneer grade: A (exposed face)-B (bookended grain minimum 16" o. C. Or as otherwise specified).
 - 5. Hardwood plywood: HVPA: HP.1. Species of face veneer shall be as shown or as specified in connection with each particular item.

2.03 LAMINATE MATERIALS

- A. Plastic-laminate countertops, shelves and work surfaces.
 - 1. Plastic Laminate: High pressure plastic laminate meeting or exceeding National Electrical Manufacturer's Association NEMA LD 3-1985 performance standards for high pressure decorative laminates as to resistance to wear, burns, stains, moisture, water and

dimensional change for types and grade designations of plastic laminates indicated. Laminates shall be GREENGUARD for Indoor Air Quality Certified by the GREENGUARD Environmental Institute under the GREENGUARD Standard for Low Emitting Products.

- a. General Purpose 50: Nominal 0.050-inch thick, for horizontal and high use exposure.
 - b. General Purpose 28: Nominal 0.028-inch thick, for vertical and medium use exposure.
2. Backing sheet - 0.02 inches thick; Post forming - 0.042 inches thick; Cabinet liner - 0.02 inches thick.
 3. Fill and seal laminate joints with Seamfil by Kampel Enterprises, Inc. or equal; colors to match laminate.
- B. Manufacturers:
1. Basis of Design: Formica Corporation: www.formica.com.
 2. Equal products from other manufacturers may be submitted for review.
 - a. Substitutions: See Section 01600 - Product Requirements.

2.04 SOLID SURFACE

- A. Basis of Design: Corian by Du Pont. Color as indicated on drawings. Provide edge treatments as shown. Install with seamless joints. Minimum Thickness: 1/2" except where otherwise indicated.
- B. Equal products from other manufacturers may be submitted for review.
1. Substitutions: See Section 01600 - Product Requirements.

2.05 COUNTERTOPS

- A. Plastic Laminate: Conventionally fabricated with plywood substrate. Medium density fiberboard substrate may be used if accepted by Architect. Covered with HDPL and edged with PVC insert.
- B. Solid Surface: Conventionally fabricated with plywood substrate. Medium density fiberboard substrate may be used if accepted by Architect

2.06 ACCESSORIES

- A. Adhesive: Type recommended by AWI/AWMAC to suit application.
1. Low-VOC, FS, type II Water and Mold resistant. Comply with Rule #1168 "Adhesive and Sealant Applications" of the South Coast Air Quality Management District of California.
- B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
1. Use at all exposed shelf edges.
 2. Use at exposed plastic laminate countertop edges.
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.

2.08 HARDWARE

- A. Pulls: 4" x 1.5" X 1/4" diameter anodized aluminum with concealed screws
- B. Hinges: Self-closing spring-loaded adjustable mortised into cabinet sides; 2 per door.
- C. Miscellaneous brackets and supports
1. Material: Steel except where otherwise indicated.
 2. Manufacturer's standard, factory-applied, textured powder coat.
 3. Color: Black.
- D. Drawer Systems: Integrated drawer slide and side. Draw assembly as indicated on Drawings.

1. Extension Type: Full extension ball bearing slide.
 2. Static Load Capacity: 75 Lbs.
- E. Stainless steel pins with flat ends for supporting adjustable shelves. Space 2 rows of aligned holes in cabinet sidewall 1" O.C. starting 6" from top and bottom of cabinet. Size holes to accommodate pins.

2.09 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 2. Cap exposed plastic laminate finish edges with material of same finish and pattern except where otherwise indicated on the Drawings.

2.10 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where indicated, use materials impregnated with fire-retardant chemical formulations indicated by a pressure process or other means acceptable to authorities having jurisdiction to produce products with fire-test-response characteristics specified.
1. Do not use treated material that does not comply with requirements of referenced woodworking standard or that is warped, discolored, or otherwise defective.
 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
 3. Fabricator may use the non-pressure process where permitted by code, otherwise use the pressure process.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with AWPAC20 (lumber) and AWPAC27 (plywood), for woodwork items indicated as fire retardant treated. Use the following treatment type:
1. Interior Type A: Low-hygroscopic formulation.
 2. Where wood specie and treatment process permit, mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discoloration from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork. Otherwise, mill lumber after treatment.
 3. Kiln-dry material before and after treatment to levels required for untreated material.
- C. Fire-Retardant-Treated Lumber and Plywood by Non-pressure Process: Apply non-toxic, water-soluble, fire-retardant treatment by dip, spray, roller, curtain coating, vacuum chamber, or soaking to achieve flame-spread rating of 25 or less and smoke-developed rating of 450 or less per ASTM E 84.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section. Coordinate with electrical and plumbing requirements.
- C. Coordinate location of blocking and other supports.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.
- F. Secure cabinets to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Site glaze glass materials using the Interior Dry method specified in Section 08 8000.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 078400 FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping materials.
- B. Firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on drawings or not, and other openings indicated.
 - 1. Firestopping shall be applied where required by code and/or where required by authorized code officials.
 - 2. Firestopping shall be applied to all penetrations through fire rated assemblies including, but not limited to, pipes, conduits, structural members, ducts, cables, and similar items.
 - 3. The application of firestopping is understood and typical for penetrations through fire rated assemblies, floors, walls, chases and otherwise, and is, generally, not specifically identified on the Drawings.
 - 4. Firestopping shall be applied to all such penetrations whether or not it is indicated on the Drawings.

1.02 RELATED SECTIONS

- A. Section 014500 - Cutting and Patching
- B. Section 081100 - Custom Steel Frames
- C. Section 092600 - Gypsum Board Assemblies

1.03 REFERENCES

- A. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 1997.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- D. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section on Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, firestopping test or design number, and type of firestopping which is appropriate for each type of penetration. Provide in all locations where required by code and whether or not "firestopping" is indicated on the Drawings.
- C. Product Data: Provide data on product characteristics.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

- F. Certificate from authority having jurisdiction indicating approval of materials used.

1.05 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs which provide the scheduled fire ratings when tested in accordance with methods indicated and ASTM E 119.
1. Listing in the current classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 2. Current evaluation reports published by CABO, ICBO, or BOCA will be considered as constituting an acceptable test report.
 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

1.06 MOCK-UP

- A. Install one firestopping assembly representative of each fire rating design required on project.
1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
- B. Obtain approval of authority having jurisdiction before proceeding.
- C. If accepted, mock-up will represent minimum standard for the Work.
- D. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING ASSEMBLIES

- A. Firestopping: Any material meeting the requirements and which will be inconspicuous when used in conjunction with scheduled finishes and architectural details.
1. Coordinate selection of materials with scheduled finishes to be applied to the surface.
 2. Do not use firestopping materials or methods which will conflict with finish systems.
 3. Fire Ratings: See Drawings for required systems and ratings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.
- B. Verify if firestopping will be used in conjunction with an architectural detail and/or finish. Select firestopping method which will be inconspicuous.
- C. Verify method of firestopping to be used for each penetration. Drawings do not indicate type of firestopping.
- D. Verify what finishes, if any, are scheduled for each area and coordinate firestopping work so as not to conflict with the scheduled finishes.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Coordinate installation to permit the installation of finishes and other subsequent work
- D. Install labeling required by code.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.
- C. Remove excess materials which may conflict with subsequent work and which are not necessary to provide required fire rating

END OF SECTION

SECTION 079000 JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.

1.02 RELATED SECTIONS

- A. Section 078400 - Firestopping: Firestopping sealants.
- B. Section 099000 - Paints and Coatings

1.03 REFERENCES

- A. ASTM C 834 - Standard Specification for Latex Sealants; 2000.
- B. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications; 1998.
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 1998.
- D. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2000.
- E. ASTM D 1667 - Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam); 1997.

1.04 SUBMITTALS

- A. Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit three samples, 3/8 x 6 inch in size illustrating sealant colors for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Schedule: Installer/applicator shall submit a detailed schedule of all conditions requiring sealant and the proposed sealant assembly to be used for each condition.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years experience.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after

installation.

1.07 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.08 WARRANTY

- A. Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five-year period after Date of Substantial Completion.
 - 1. Where the manufacturer, as a standard feature, provides a warranty which exceeds five years that warranty shall become the warranty which shall apply to this Project.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, watertight seal, and acoustical, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Silicone Sealants:
 - 1. Bostik: www.bostik.com.
 - 2. Dow Corning Corp: www.dowcorning.com.
 - 3. GE Plastics: www.geplastics.com.
 - 4. Pecora Corporation: www.pecora.com.
 - 5. Sonneborn Building Products, ChemRex, Inc: www.chemrex.com.
 - 6. Tremco, Inc: www.tremcosealants.com.
 - 7. Substitutions: See Section 016000 - Product Requirements.
- B. Polyurethane Sealants:
 - 1. Bostik: www.bostik.com.
 - 2. Pecora Corporation: www.pecora.com.
 - 3. Sonneborn Building Products, ChemRex, Inc: www.chemrex.com.
 - 4. Tremco, Inc: www.tremcosealants.com.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- C. Polysulfide Sealants:
 - 1. Morton International, Inc.
 - 2. Pecora Corporation: www.pecora.com.
 - 3. Sonneborn Building Products, ChemRex, Inc: www.chemrex.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- D. Acrylic Sealants:
 - 1. Tremco, Inc: www.tremcosealants.com.
 - 2. Substitutions: See Section 016000 - Product Requirements.
- E. Butyl Sealants:
 - 1. Bostik: www.bostik.com.
 - 2. Tremco, Inc: www.tremcosealants.com.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- F. Acrylic Emulsion Latex Sealants:
 - 1. Bostik: www.bostik.com.
 - 2. Pecora Corporation: www.pecora.com.

3. Sonneborn Building Products, ChemRex, Inc: www.chemrex.com.
 4. Tremco, Inc: www.tremcosealants.com.
 5. Substitutions: See Section 016000 - Product Requirements.
- G. Preformed Compressible Foam Sealers:
1. Emseal Joint Systems, Ltd: www.emseal.com.
 2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
 3. Polytite Manufacturing Corporation: www.polytite.com.
 4. Substitutions: See Section 016000 - Product Requirements.

2.02 SEALANTS

- A. Type E2 - General Purpose Exterior Sealant: Acrylic, solvent release curing; ASTM C 920, Grade NS, Class 12-1/2, Uses M, G, and A; single or multi- component; paintable. To be used where sealant is to be painted along with the adjacent materials, otherwise use Type E1.
1. Applications: Use for Joints which will be field painted:
- B. Type I-1 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
1. Color: Standard colors matching finished surfaces, except where sealant is to be painted.
 - a. Color where sealant is to be painted: off-white color.
 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Joints between countertops, without sinks, and wall surfaces.
 - d. Other interior joints for which no other type of sealant is indicated.
- C. Type I-2 - Shower/Tile Sealant: White silicone; ASTM C 920, Uses M and A; single component, mildew resistant.
1. Applications: Use for:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between countertops with sinks and wall surfaces.
 - c. Joints in tile work.
- D. Type A-1 - Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
1. Applications: Use for concealed locations only at assemblies which have acoustical insulation or sound resistant doors and frames.
 - a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
 - b. Seal electrical, mechanical and other items which penetrate partitions identified to have acoustical insulation.
- E. Type S-1 - Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, A, G, M, O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
1. Color: Standard colors matching finished surfaces.
 2. Movement Capability: Plus and minus 25 percent.
 3. Service Temperature Range: -65 to 180 degrees F (-54 to 82 degrees C).
 4. Shore A Hardness Range: 15 to 35.
 5. Applications: Use for:
 - a. Glazing applications, except where otherwise recommended by manufacturer of glazing or glazing framing system.
- F. Unspecified Sealants

1. Provide sealants for each application which is not indicated in this Section but which is encountered during the Work. Provide sealants which are recommended by the manufacturer as the "best" product for the application.
2. Where a sealant is not specified for a condition, provide a product which is compatible with the materials to be sealed and which is recommended by the sealant manufacturer for the specific application
 - a. Provide colors sealants for applications which will be exposed to view. Furnish products from manufacturer's standard colors; Architect to select colors.
 - b. Provide paintable sealant for applications which are scheduled for field painting.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Identify each assembly to be sealed and assign the proper sealant to the assembly.
 1. Verify if finished assembly will be painted, concealed or exposed and assign appropriate products
- B. Verify that substrate surfaces are ready to receive work.
- C. Verify that environmental conditions are suitable for sealant installation
- D. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Perform acoustical sealant application work in accordance with ASTM C 919.

- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION OF FINISHED WORK

- A. Protect sealants until fully cured and, where applicable, painted.

3.06 SCHEDULE

- A. Applications of sealant shall be according to the general guidelines as indicated by the descriptions in Part 2 of this Section.
- B. Installer/applicator shall furnish a schedule as identified in Part 1 of this Section, under "Submittals".

END OF SECTION

SECTION 081100 CUSTOM STEEL FRAMES AND DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Steel doors and frames.
 - 1. Provide hollow metal steel doors and frames as indicated on the Door and Frame Schedule and on the drawings.

1.02 RELATED SECTIONS

- A. Section 087100 - Door Hardware.

1.03 REFERENCES

- A. ANSI A250.6 - Hardware on Standard Steel Doors (Reinforcement--Application); 1997.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 1998.
- C. ASTM A 366/A 366M - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality; 1996.
- D. ASTM A 569/A 569M - Standard Specification for Commercial Steel, Sheet and Strip, Carbon (0.15 Maximum Percent), Hot-Rolled; 1997.
- E. ASTM A 591/A 591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications; 1996.
- F. ASTM A 620/A 620M - Standard Specification for Drawing Steel (AS), Sheet, Carbon, Cold-Rolled; 1997.
- G. ASTM A 653/A 653M - Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1997.
- H. DHI A115.1G - Installation Guide for Doors and Hardware; Door and Hardware Institute; 1994.
- I. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- J. NFPA 80 - Standard for Fire Doors and Windows; National Fire Protection Association; 1995.
- K. SDI 105 - Recommended Erection Instructions for Steel frames; Steel Door Institute; 1992.
- L. SDI 113 - Test Procedure and Acceptance Criteria for Apparent Thermal Performance of Steel Door and Frame Assemblies; Steel Door Institute; 1979.
- M. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. Product Data: Provide manufacturer's standard details and catalog data demonstrating compliance with referenced standards; installation instructions.

- B. Certificates:
 - 1. Provide manufacturer's certification that products comply with referenced standards.
 - 2. Provide evidence of manufacturer's membership in the Steel Door Institute.
- C. Shop Drawings: Submit for approval of the following:
 - 1. Shop drawings showing all openings in the door schedule and/ or drawings; provide details of door design, door construction and methods of assembling sections, hardware locations, anchorage and fastening methods, door frame types, and finish requirements.
- D. Door, frame, and hardware schedule in accordance with SDI 111.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide all products from a single manufacturer who is a member of the Steel Door Institute.
- B. Fire-rated Assemblies: Manufactured in accordance with Underwriter's Laboratories Inc. and bearing their label.
- C. Manufacture products only after receipt of approved hardware schedule and templates.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon delivery, inspect all materials for damage; notify shipper and supplier if damage is found.
- B. Protect products from moisture, construction traffic, and damage.
- C. Store vertically under cover. Do not use non-vented plastic or canvas shelters. Should wrappers become wet, remove immediately.
- D. Place units on 4 inch high wood sills or in a manner that will prevent rust or damage. Provide 1/4 inch space between doors to promote air circulation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Any manufacturer who meets the criteria of this Section.

2.02 MATERIALS

- A. Steel Sheet for Doors and Frames:
 - 1. Cold rolled steel: ASTM A 366/A 366M or ASTM A 620/A 620M.
 - 2. Hot rolled steel: Pickled and oiled, ASTM A 569/A 569M, Type B.
 - 3. Galvanized steel: ASTM A 653/A 653M; hot-dipped zinc-coated steel; hot-dipped zinc-iron alloy-coated steel of A40/ZF120 coating, minimum.
- B. Steel Sheet for Anchors and Accessories: Electrolytically deposited zinc coated steel; ASTM A 591/A 591M, coating Class B, minimum.

2.03 DOORS AND FRAMES

- A. Comply with SDI 100. Include two copies of applicable requirements of SDI-100 with submittals required for this section.
 - 1. All welded connections shall be filled and ground smooth
 - 2. Except for applied glazing stops, all connectors and fasteners shall be concealed or countersunk, filled and ground smooth.
- B. Fire-Rated Openings: Comply with NFPA 80; UL or ITS (Warnock Hersey) listed.
 - 1. Affix permanent labels attesting to fire resistance.
 - 2. Provide manufacturer's certificate that oversized openings have been constructed in accordance with all other applicable requirements for labeled door construction.
- C. Interior Doors: Grade II, Model 2, 16 gage doors (minimum) (heavy-duty, seamless design, 16 gage frames)
- D. Interior vision panel frames: Provide mitered and welded 12 gage galvanized.
- E. Frames: Provide mitered and welded unit type frames at all new framed openings. Galvanize after welding and reinforcing.
- F. Door Reinforcement: Except where referenced standards indicate more stringent requirements provide the following reinforcing.
 - 1. Closers, Holders: 10 gauge
 - 2. Butts: 7 gauge
 - 3. All other hardware: 12 gauge
- G. Frame Reinforcement: Except where referenced standards indicate more stringent requirements provide the following reinforcing
 - 1. Butts: 1/4" thick steel plate welded at each end
 - 2. Strikes: 14 gauge
 - 3. Closers, Holders: 10 gauge
 - 4. All other reinforcements: 12 gauge
 - 5. Lights and Transoms: Provide tubular mullions and transom bars with heads and jambs.
- H. Galvanizing: Provide units of galvanized steel at exterior openings and at other locations where indicated. Galvanize frames after fabrication; use hot dip galvanizing process.
- I. Glazed Lights: Provide metal, screwed, glazing stops and beads.

2.04 ACCESSORIES

- A. Silencers: Resilient rubber fitted into drilled hole.
- B. Bituminous Coating: Fibered asphalt emulsion. Apply to inside of all frames at masonry openings.
- C. Primer: Zinc chromate type; except where this primer may conflict with galvanizing or with finishes indicated in Section 09900.
- D. Weatherstripping: Specified in Section 08710.
- E. Finishing: Provide factory- primed units; coordinate primer with finish paint requirements in

Section 099000.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are suitable before beginning installation of frames. Identify which partitions must be constructed with door frames in place; coordinate work accordingly.
 - 1. For wrap-around frames, verify that completed openings are of correct size and thickness.
 - 2. For butt type frames, verify that completed openings are of correct size.
- B. For frames to be installed in existing walls; verify that opening is correctly sized and is plumb and true.
- C. Correct unsatisfactory conditions before proceeding with installation.

3.02 INSTALLATION

- A. Install frames plumb, level, rigid, and in true alignment as recommended in SDI 105 and A115.1G.
- B. Install doors plumb and in true alignment and fasten to achieve the maximum operational effectiveness and appearance of the unit. Maintain clearances specified in ANSI A250.8 and NFPA 80 whichever is more restrictive.
- C. Fill welded wrap-around frames in masonry construction with grout, as masonry is laid-up. Brace or fasten frame in such a way to prevent pressure of the grout from deforming frame.
 - 1. Mix grout to provide 4-inch maximum consistency and hand trowel into place.
 - 2. Do not use grout mixed to thin "pumpable" consistency.
- D. Set welded frames in place at stud partitions as partitions is being constructed; fill void between frame and studs with acoustic glass fiber insulation.
 - 1. Except where indicated otherwise, provide double wall studs at all jambs and double studs at heads for door openings exceeding 4'-0".
- E. For frames installed in new partitions and walls provide a minimum of three anchors per jamb for frames up to 7'-0" high; four anchors for frames over 7'-0" high but not exceeding 9'-0" high.
- F. When installing a new welded frame in an existing wall, provide a minimum of five anchors per jamb for frames up to 7'-0" high; six anchors for frames over 7'-0" high but not exceeding 9' 0" high.
- G. Coordinate electrical requirements for the installation of doors and frames requiring electric strikes, hold open devices, security devices or similar electric and electronic devices.
- H. Where new doors and frames are being installed into existing walls, coordinate with cutting and patching requirements
- I. Anchors shall be concealed except exposed anchors may be used where necessary to secure a new frame to an existing wall.
 - 1. Where exposed wall anchors are necessary, install through the face of the frame, countersink fasteners and fill flush with metal filler and sand smooth.
- J. Fill welded wrap-around frames in plaster construction with plaster as work progresses.

- K. If additives are used in masonry or plaster work during cold weather, field coat the inside of steel frames with a bituminous compound to prevent corrosion.
- L. Install doors plumb and in true alignment and fasten to achieve the maximum operational effectiveness and appearance of the unit. Maintain clearances specified. Shim as indicated in DHI A115.1G and SDI 122.
- M. Install hardware in accordance with hardware manufacturer's recommendations and templates. Consult DHI A115.1G and ANSI A250.6 as necessary.

3.03 ADJUST AND CLEAN

- A. Adjust doors for proper operation, free from binding or other defects.
- B. Clean and restore soiled surfaces. Remove scraps and debris, and leave site in a clean condition.

END OF SECTION

SECTION 085113 ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Operating Window Units: Single-Hung Aluminum Windows.
2. Glass and Glazing for Aluminum Windows.
3. Wood Blocking, Shims, Anchors, Clips, and all accessories necessary for a complete installation furnished and installed.
4. All aluminum trim and closure pieces
5. Installation labor, tools, equipment, and services necessary for installation of Aluminum Windows.

B. Related Sections:

1. Section 079000 - Joint Sealants

1.02 REFERENCES

A. Aluminum Association (AA)

1. DAF-45 – “Designation System for Aluminum Finishes”

B. Fenestration and Glazing Industry Alliance (FGIA) (a.k.a.) American Architectural Manufacturers Association (AAMA):

1. 101 – “Voluntary Performance Specification for Windows, Skylights and Glass Doors”
2. 502 – “Voluntary Specification for Field Testing of Newly Installed Fenestration Products”
3. 513 – “Voluntary Specification for Standard Laboratory Test Method For Determination Of Forces And Motions Required To Activate Operable Parts Of Operable Windows And Doors In Accessible Spaces”
4. 611 – “Voluntary Specification for Anodized Architectural Aluminum”
5. 1503 – “Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections”
6. 2400 – “Voluntary Specification for Installation of Windows with a Mounting Flange in Stud Frame Construction”
7. 2604 – “Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels”

8. 2605 – “Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels”
9. CW-10 – “Care and Handling of Architectural Aluminum from Shop to Site”

C. American National Standards Institute (ANSI) Publications

1. Z97.1 – “Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings”

D. ASTM International (ASTM) Publications:

1. C518 – “Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus”
2. C1036 – “Standard Specifications for Flat Glass”
3. C1048 – “Standard Specifications for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass”
4. D3985 – “Standard Test Method for Oxygen Gas Transmission Rate Through Plastic Film and Sheeting Using a Coulometric Sensor”
5. E90 – “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements”
6. E283 – “Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen”
7. E330 – “Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”
8. E331 – “Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference”
9. E413 – “Classification for Rating Sound Insulation”
10. E547 – “Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential”
11. E774 – “Standard Specification for Sealed Insulating Glass Units”
12. F588 - “Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact”
13. F1249 – “Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor”

E. National Glass Association (NGA):

1. “GANA Glazing Manual”

F. Federal Specifications (FS) Publications:

1. FS-RR-W-365A "Wire Fabric (Insect Screening)"
- G. Insulating Glass Certification Council (IGCC)
- H. National Fenestration Ratings Council (NFRC)
- I. Screen Manufacturers Association (SMA) Publications:
 1. 1004 "Specifications for Aluminum Tubular Frame Screens for Windows"
- J. U.S. Consumer Product Safety Commission (CPSC) Publications:
 1. 16 CFR Part 1201 "Safety Standard For Architectural Glazing Materials"
- K. Window and Door Manufacturers Association (WDMA) Publications:
 1. FGIA/AAMA/WDMA 101/I.S.2/NAFS "Voluntary Performance Specification for Windows, Skylights and Glass Doors"
 2. FGIA/AAMA/WDMA/CSA 101/I.S.2/A440 "Standard/Specification for Windows, Doors and Unit Skylights"

1.03 SUBMITTALS

- A. Submit "Letter of Conformance" in accordance with Section 01300 Administrative Requirements – with the following supporting data:
 1. Product data for each type of aluminum window specified, including standard construction details, dimensions of individual components, profiles, finishes, hardware, and accessories.
 2. Shop drawings for each type of window specified, including ¼-inch scale wall elevations, typical unit elevations at ¾-inch scale details, full size details of typical composite members and the following:
 - a. Panning Details: Where required
 - b. Flashing and drainage details.
 - c. Joinery details.
 3. Product certificates signed by the window manufacturer certifying that window units comply with specified performance requirements.
 4. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.05 PERFORMANCE REQUIREMENTS as requested by Architect.

1.04 DEFINITIONS

- A. Performance grade number, included as part of the FGIA/AAMA/WDMA/CSA 101/I.S.2/A440 product designation code, is actual design pressure in pounds force per square foot used to determine structural test pressure and water test pressure.

1.05 PERFORMANCE REQUIREMENTS

- A. Certify that windows have been tested in accordance with FGIA/American Architectural Manufacturers Association (FGIA/AAMA/WDMA) Specification for Performance Class specified complying with the following performance standards:
 - 1. FGIA/AAMA/WDMA/CSA 101/I.S.2/A440 Performance Requirements: Provide aluminum windows of the performance class and grade indicated that comply with FGIA/AAMA/WDMA/CSA 101/I.S.2/A440.
 - a. Performance Class: H-AW
 - b. Performance Grade: 50
 - 2. Uniform Structural Properties (ASTM E330): Pressure acting inward and outward. Window to be operable with permanent deformation at a maximum of 1/175 of its span, when tested at a static air pressure difference of the following:
 - a. Class H-AW-50: 75.0 PSF
 - 3. Water Resistance (ASTM E331 and ASTM E547): No water penetration at test pressure indicated.
 - a. Class H-AW-50: 10.00 PSF
 - 4. Air Leakage (ASTM E283):
 - a. Single-Hung Windows: Maximum 0.3 CFM per sq./ft. of total exterior surface area, when tested at a static air pressure differential of 6.2 PSF minimum.

1.06 QUALITY ASSURANCE

- A. All window units shall be manufactured by a single source.
 - 1. All windows in any one project must be by the same manufacturer and with comparable frame depth, profile, glazing bite, and installation requirements. Manufacturer must provide a window system that can incorporate all window configurations used on the project.
 - 2. Standards: Requirements for aluminum windows, terminology and standard of performance, and fabrication workmanship are those specified and recommended in FGIA/AAMA/WDMA/CSA 101/I.S.2/A440 and The Aluminum Association (AA).
 - a. All window units shall be labeled as conforming to FGIA/AAMA/WDMA/CSA 101/I.S.2/A440. The label shall state the name of the manufacturer, the approved labeling agency and the product designation as specified in FGIA/AAMA/WDMA/CSA 101/I.S.2/A440.
 - b. All testing shall be conducted using FGIA/AAMA/WDMA/CSA 101/I.S.2/A440 Gateway Performance minimum specified test sizes.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Transportation and Handling: Transport products by methods to avoid product damage, deliver in undamaged condition in manufacturer's unopened containers or packaging. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- B. Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

1.08 WARRANTIES

A. Aluminum Window Warranty

- 1. Products: Submit a written warranty, executed by the window manufacturer, for the following:
 - a. Framing, sash components, and hardware: A period of five (5) years from the date of manufacture, against defective materials and workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which results in premature failure of the windows or parts, outside of normal wear.
 - b. Insulating glass units: A period of ten (10) years from the date of manufacture, against insulating glass seal failure unrelated to glass breakage.
 - c. In the event windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
 - d. Where applicable, materials which are applied to the face of insulating glass for the purpose of simulating division in glass openings (SDL's) are warranted against detaching from the glass surface for a period of five (5) years.
 - e. Finish: Refer to Part 2, Section 2.06 "FINISHES" for warranty requirements.
 - f. Warranty for all components must be direct from the manufacturer (non-pass through) and non-prorated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.
- 2. Installation: Submit a written warranty, executed by the window installer, for a period of one (1) year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
 - a. In the event installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Any domestic manufacturer whose products meet or exceed the project requirements.

- B. Basis of Design Manufacturer and Product: Quaker Window Products Company, Inc. (800) 347-0438
- a. Model/Product: Single-Hung Window: "H650 SH Series"
1. Substitutions: See Section 01600 – Product Requirements. Provide the following for proposed substitutions.
- a. Independent test reports certifying that proposed product is in accordance with, and meets all criteria specified in Section 1.05 "PERFORMANCE REQUIREMENTS".
 - b. Drawing details of elevations and sections, and samples in accordance with, and as specified in Section 1.03 "SUBMITTALS".
 - c. Copy of manufacturer's warranty specified in accordance with, and as specified in Section 1.08 "WARRANTIES".
 - d. Any additional information requested by the Architect.

2.02 MATERIALS

A. Aluminum Members:

- 1. Extruded aluminum prime billet 6063-T6 alloy for primary components, 6063-T6, or 6061-T6 for structural components, all in accordance with (ASTM B221).

B. Structural Thermal Barrier Construction:

- 1. Frame and sash members shall include a structural thermal barrier, applied in the manufacturer's facility, using concealed low-conductance poured-in-place polyurethane in a pre-treated cavity.
- 2. After proper curing, the aluminum bridge section must be removed to provide a 3/8" minimum separation between interior and exterior metal surfaces in main frame members, and 11/16" minimum separation between interior and exterior metal surfaces in sash components.
- 3. The thermal barrier cavity shall have a manufactured mechanical lock applied consisting of abrading or lancing of the extrusion cavity prior to application of poured-in-place polyurethane.
- 4. Thermal Break Performance Requirements for main frame members:
 - a. Shear strength: minimum 2,500 Lbf in accordance with (AAMA TIR-A8).
 - b. Flexural strength: minimum 19,000 psi in accordance with (AAMA_D 790).
 - c. Thermal conductivity of barrier material: maximum 0.84 BTU-in/(hr-ft²-°F) in accordance with (ASTM C 518).
 - d. Systems employing non-structural thermal barriers, or barrier systems absent of a mechanical lock application are not acceptable.
- 5. Thermal Break Performance Requirements for sash components:

- a. Thermal conductivity of barrier material: maximum 0.21 BTU-in/(hr-ft²-°F) in accordance with (ASTM C 518).
- b. Systems employing non-structural thermal barriers, or barrier systems absent of a mechanical lock application are not acceptable.

2.03 MANUFACTURED UNITS

- A. Principal window frame members shall have a minimum 0.070" wall thickness, which includes all hardware mounting webs, and sectional flanges.
- B. Window frame depth shall be 4 1/8" minimum.
- C. Sash Removal: "Side Load" design shall allow for lower sash to be removed from interior by detachment of balances.
- D. Glazing: Refer to Section 2.05 "GLASS MATERIALS".

2.04 COMPONENTS

- A. All fasteners, tools, equipment, and other materials necessary for a complete installation shall be furnished by the Contractor.
 1. Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be noncorrosive and compatible with all window members, cladding, trim, hardware, anchors, and other components.
- B. Locking handles, cases, and strikes to be die cast or stainless steel.
- C. Thermoplastic or thermo-set plastic caps, housings, and other components to be injection-molded nylon, extruded PVC, or other suitable compound.
- D. Hardware:
 1. Balances:
 - a. High Performance block and tackle balance system which shall be in accordance with (AAMA 101) and (AAMA 902) for Class (5) performance requirements, with a minimum (0.30) Manual Applied Force Ratio (MAF).
 2. Sash Lock shall be aluminum spring loaded gravity latch, located at bottom of lower sash.
 3. Lift handle shall be extruded, and integral with the bottom sash, and continuous.
- E. Insect Screens: Provide removable insect screen panel for each movable glazed sash.
 1. Screen Fabric: Aluminum: 18 by 16 mesh of 0.013" diameter wire. Comply with FS-RRW-365, Type VII, except black anodized or "gun metal" coating on wire.
 2. Screen Frame: Provide formed or extruded aluminum frames and removable vinyl fabric retainer spline.
 - a. Finish shall match window.

F. Accessories:

1. Sills: Manufacturer's standard exterior sills, as shown on Drawings.
 - a. Nailing fin: Shall be integral to the frame and consist of extruded aluminum as a manufacturer's standard.
 - b. Sill Flashing: manufacturer's standard snap-on type, if required as shown on Drawings.
2. Trim: Manufacturer's standard interior snap trims, type as shown on Drawings.
3. Mullions: Provide mullions and cover plates as shown, matching window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
4. Panning: Where required to accommodate existing exterior wall construction. Show details with submittals if panning is required.
 - a. Provide extruded aluminum panning in accordance with (ASTM B221) by Window Manufacturer, type and size as indicated on Drawings.
 - b. Panning joinery shall be cut to fit by Window Manufacturer.
 - c. Finish of Panning components shall comply with Section 2.06 "FINISHES", and color shall match Aluminum Windows.
1. Receptor System / Subframe: Where required to accommodate existing exterior wall construction. Show details with submittals if panning is required.
 - a. Provide extruded aluminum, thermally broken Receptor System with Aluminum Windows by Window Manufacturer in accordance with (ASTM B221), as shown on Drawings.
 - b. Receptor System components shall encompass a complete assembled frame, fastened and sealed independently from window frames prior to window installation according to manufacturer's instructions.
 - c. Finish of Receptor System components shall comply with Section 2.06 "FINISHES", and color shall match Aluminum Windows.

2.05 GLASS MATERIALS:

A. Clear Float Glass: ASTM C1036, Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select) as manufactured by one of the following:

1. Approved Manufacturers: any domestic glass manufacturer/fabricator who meets or exceed the project requirements.
 - a. Basis of Design Manufacturer: Cardinal Industries
 - b. Substitutions: See Section 01600 – Product Requirements.

C. Windows shall be glazed as follows:

1. Sound Transmission Class (STC) (ASTM E413): Provide glazing required for conforming to over all STC ratings as specified for aluminum windows.

- a. Sound Transmission Class (STC): 28 minimum

D. Insulating Glass: Manufacturer's standard units that comply with specified quality standards and coatings.

- a. Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, space material, and desiccants.

- 1) Total Thickness: 1"

- 2) Thickness of Each Pane: As necessary to meet structural performance criteria but not less than 3/16" thick.

- 3) Air Space: Argon gas filled

- b. Exterior Pane of Glass:

- 1) Provide tempered glass where shown on Drawings and as required by local codes and ordinances.

- c. Insulated Unit Sealing System:

- 1) Exposed color of Insulating glass Spacer shall be black.

- 2) Insulating glass unit spacer system must include a secondary dual seal. This also applied to solid foam warm edge seal glass spacer systems.

2.06 FINISHES

A. Finish of Aluminum Components

1. Finish of all exposed areas of aluminum windows and components shall be applied in accordance with the appropriate AAMA Voluntary Guide Specification shown below:

- a. Electrolytically Deposited Anodic Coating, Class 1, Designation AAM12C21A44 conforming to (FGIA/AAMA 611)

- b. Finish Warranty Period: 5 years from date of Substantial Completion

- c. Color Selection: Dark bronze

2.07 FABRICATION

- A. Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly yet enabling installation.

- B. Rigidly fit joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.
- C. Develop drainage holes with moisture pattern to exterior.
- D. Prepare components to receive anchor devices. Fabricate anchorage items.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
 - 2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows

- 1. Install windows with skilled tradesmen in exact accordance with approved Shop Drawings, Installation Instructions, Specifications, and in accordance with (FGIA/AAMA 101/I.S.2./ A440).
- 2. Windows must be installed plumb, square, and level for proper weathering and operation. Jambs must not be "sprung", bowed, or warped during installation.
- 3. Any uncoated aluminum components of Aluminum Window shall be insulated from direct contact with steel, masonry, concrete, or other dissimilar metals by bituminous paint, zinc chromate primer, nonconductive shims, or other suitable insulating materials.

3.02 ADJUSTING AND CLEANING

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, or other debris. Protection from this point shall be the responsibility of the General Contractor.

END OF SECTION

SECTION 087100 DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for non-fire rated hollow metal doors.

1.02 RELATED SECTIONS

- B. Section 081100 - Custom Steel Frames and Doors

1.03 REFERENCES

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.
- B. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 1990.
- C. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Wood Flush Doors; Door and Hardware Institute; 1993.
- D. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 1999.
- E. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
 - 2. Submit manufacturer's parts lists, templates, and installation requirements.
- C. Samples:
 - 1. Submit 2 samples of each type of hinge, latchset, lockset, closer, and panic device illustrating style, color, and finish.
 - 2. Samples will be retained by the Owner as maintenance stock.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Project Record Documents: Record actual locations of installed cylinders and their master key code.
- F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- G. Keys: Deliver with identifying tags to Owner's Representative by security shipment direct from hardware supplier.

- H. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Perform work in accordance with the following requirements:
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience.
- D. Hardware Supplier Qualifications: Company specializing in supplying institutional door hardware and the design of a keying system for a project of this type with 5 years of documented experience.
- E. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section and to plan a Keying System according to the needs of the Owner.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for requirements applicable to fire rated doors and frames.
- B. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.

1.07 PRE-INSTALLATION MEETING

- A. Convene one week prior to commencing work of this section.
 - 1. Review keying requirements with Owner's representative. New keying to be compatible with existing keying system.

1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.09 COORDINATION

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- B. Furnish templates for door and frame preparation.
- C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- D. Coordinate Owner's keying requirements during the course of the Work. Comply with the requirements indicated under "Keying" to establish Keying Plan for the project

1.10 WARRANTY

- A. Closeout Submittals, for additional warranty requirements.
- B. Provide 10-year warranty for door closers.

C. Additional Warranties:

1.11 MAINTENANCE PRODUCTS

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.12 EXTRA MATERIALS

- A. Provide 4 extra key lock cylinders for each master keyed group.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Reference Manufacturers and Products: The Hardware Schedule for this project has been created using the referenced Products as indicated in this Section.
 - 1. Equal products from the other manufacturers indicated in this Section may be submitted for review.
 - a. The fact that another manufacturer is indicated does not, necessarily, indicate that the manufacturer has a product equal to the referenced product.
 - 2. Equal products from other manufacturers not indicated in this Section shall be submitted according to the requirements for substitutions
- B. Hinges/Butts: Referenced Manufacturer: Stanley
 - 1. H-1: Interior door with closer; FBB - 168; 4-1/2" x 4-1/2", ball bearing, plated steel, US32D, non rising pin; ANSI 8111. Three per leaf unless otherwise indicated.
 - 2. Equal Products from the following manufacturers may be submitted for review.
 - a. Bommer Industries, Inc: www.bommer.com.
 - b. Hager Companies: www.hagerhinge.com.
- C. Cylindrical Locks: Referenced Manufacturer: Schlage Lock Company
 - 1. C-1: Interior doors; Series "D" ANSI A 156.2 Series 4000 Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; "Rhodes" lever handle, 6 -pin tumbler cylinder; Function: **Classroom Lock ND70PD**.
 - 2. C-2: Interior doors; Series "D" ANSI A 156.2 Series 4000 Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; "Rhodes" lever handle, 6 -pin tumbler cylinder; Function: **Storeroom Room Lock ND80PD**.
 - 3. C-3: Interior doors; Series "D" ANSI A 156.2 Series 4000 Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; "Rhodes" lever handle, 6 -pin tumbler cylinder; Function: **Entrance/Office Room Lock ND50PD**.
 - 4. C-4: Interior doors; Series "D" ANSI A 156.2 Series 4000 Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; "Rhodes" lever handle; Function: **Passage Set ND105**.
 - 5. C-5: Interior doors; Series "D" ANSI A 156.2 Series 4000 Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; "Rhodes" lever handle; Function: **Single/Dummy Trim ND170**.
 - 6. C-6: Interior doors; Grade 1, UL listed when used in a fire rated door; 626 satin chromium finish for all exposed parts; 6 -pin tumbler cylinder; Function: **Deadbolt B60625**; Keyed with thumbturn.
 - 7. Equal Products from the following manufacturers may be submitted for review.
 - a. Best Access Systems: www.bestlock.com.
 - b. Yale-Corbin U.S.: www.yalesecurity.com.

- D. Closers: Referenced Manufacturer: LCN Closers. Series 7700 with standard forearm; without hold open, unless indicated, with delayed action closing. Provide arm with integral stop where indicated.
 - 1. CP-1: Regular Arm Closer
 - 2. CP-2: Parallel Arm Closer
- E. Door Stops/Holders: Referenced Manufacturer: Ives.
 - 1. DS-1: Wall Mounted: Model 60C, Stainless steel, US26D finish with concave rubber bumper; installed with manufacturer recommended mechanical fastener; at stud walls provide solid wood blocking.
 - 2. DS-2: Floor Stop: Ives model FS-438.
 - 3. Equal Products from the following manufacturers may be submitted for review.
 - a. Glynn-Johnson.
 - b. Hager Companies.
 - c. Triangle Brass Manufacturing Co., Inc.
- F. Protection Plates: Referenced Manufacturer: Hager Companies
 - 1. PP-1: Kickplate and Mop Plate: Kickplate: 12" high x width of door less 1-3/4"; install 1/4" from door bottom on push side. Mop Plate: 12" high x width of door less 1/2"; install 1/4" from door bottom on pull side. ANSI A156.6, J102. Stainless steel, US 32D, beveled 4 edges; Gauge: 0.050". Installed with evenly spaced oval stainless steel screws at 6" O.C. maximum in tapered holes.
 - 2. Equal Products from the following manufacturers may be submitted for review.
 - a. Hiawatha, Inc: www.hiawathainc.com.
 - b. Triangle Brass Manufacturing Co., Inc.
 - c. Rockwood.
- H. Flushbolt: Reference Manufacturer: Ives.
 - 1. FB-1: Top constant latching flush bolt latches into door frame at inactive leaf. Door frame preparation complying with ANS/BHMA A115.4; Rod Length 12"; Model FB5IT; Finish US32D
 - 2. Equal Products from the following manufacturers may be submitted for review.
 - a. Glynn-Johnson.
 - b. Hager Companies.
 - c. Triangle Brass Manufacturing Co., Inc.
- I. Clothes Hook: Reference Manufacturer: Ives.
 - 1. HK -1: Cast brass double hook mounted to interior room side of door; Model 582; Finish B26D.
 - 2. Equal Products from the following manufacturers may be submitted for review.
 - a. Glynn-Johnson.
 - b. Hager Companies.
 - c. Triangle Brass Manufacturing Co., Inc.
- J. Substitutions: See Section 01600 - Product Requirements.

2.02 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

- A. Provide products that comply with the following:
 - 1. Applicable provisions of Federal, State, and local codes.
 - 2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
 - 3. Fire-Rated Doors: NFPA 80.
 - 4. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.

5. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

B. Finishes: Identified in schedule at end of section.

2.03 KEYING

A. Planning of Keying System

1. A Keying System shall be developed encompassing the hardware to be installed for this Project and shall include interfacing new keying with existing keying. The Contractor's hardware supplier shall provide an AHC certified Hardware Consultant to perform the services indicated in this Section
2. The Contractor's Hardware Consultant shall:
 - a. Develop a Keying System to suit the express needs of the Owner to coordinate new hardware with existing hardware..
 - b. Review the Hardware Schedule and project requirements and make recommendations for modifications where appropriate to achieve the intent of the hardware identified in the schedule. Present the proposed modifications to the Architect for review.
 - c. Reflect in the Contractor's Hardware Schedule submittal the decisions made by the Owner's Representative regarding keying requirements and by the Architect for modifications to the Hardware Schedule.

B. Door Locks: Great grand master keyed.

C. Supply keys in the following quantities:

1. 4 master keys.
2. 4 grand master keys.
3. 4 great grand master keys, where applicable.

2.04 KEY CABINET

A. Cabinet Construction: Sheet steel construction, piano hinged door with cylinder type lock master keyed to building system.

B. Cabinet Size: Size for project keys plus 25 percent growth.

C. Horizontal metal strips for key hook labeling with clear plastic strip cover over labels.

D. Finish: Baked enamel, color as selected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that metal door frames and metal doors have been reinforced as specified for hardware installation. Identify non-complying items and do not proceed with hardware installation until authorized by the Owner's Representative.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.

- B. Use templates provided by hardware item manufacturer.
- C. Mounting heights for hardware from finished floor to centerline of hardware item: Comply with referenced standards for location except where ANSI/CABO A 117.1, barrier free Requirements supercede the referenced standards or are indicated on the Drawings.
 - 1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."

3.03 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 014000.
- B. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.
 - 1. Consultant shall issue a written report certifying the hardware installation and identifying non-complying work.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust hardware for smooth operation.

3.05 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01700.
- B. Do not permit adjacent work to damage hardware or finish.

3.06 DOOR HARDWARE SCHEDULE

- A. Refer to door Schedule on the Drawings to determine application of Hardware Sets in this schedule.
- B. Each piece of hardware indicated is per each door leaf in opening, except for thresholds and where noted otherwise.

SET 1: Interior Doors: Men's Room

- 1. Butts: H-1
- 2. Lockset: C-4
- 3. Closer: CP-1
- 4. Protection Plates: PP-1 both sides
- 5. Stop: DS-1 (wall)

SET 2: Interior Doors: Women's Room, Office

- 1. Butts: H-1
- 2. Lockset: C-3
- 3. Closer: CP-1
- 4. Protection Plates: PP-1 both sides
- 5. Stop: DS-1 (wall)
- 6. Clothes hook: HK-1

SET 3: Interior Doors: Locker Room

1. Butts: H-1
2. Lockset: C-4 & C6
3. Closer: CP-1
4. Protection Plates: PP-1 both sides
5. Stop: DS-1 (wall)

SET 4: Interior Doors: Lounge

1. Butts: H-1
2. Lockset: C-1
3. Closer: CP-1 with integral stop
4. Protection Plates: PP-1 both sides
5. Stop: DS-2 (floor)

SET 5: Interior Doors: Closet

1. Butts: H-1 (each leaf)
2. Lockset: C-2 - active leaf (RH leaf)
3. Flush bolt: FB-1 – inactive leaf (LH leaf)
4. Protection Plates: PP-1 (room side only)
5. Stop: DS-2 (floor) – inactive Leaf.
6. Stop: DS-1 (wall) – active leaf

END OF SECTION

SECTION 092210 NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.04 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For dimpled steel studs and runners and firestop tracks, from ICC-ES.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.02 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.

2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
 1. Steel Studs and Runners:
 - a. Minimum base-metal thickness and depth: minimum 20 gauge except where otherwise noted on the Drawings. Coordinate required gauges, spacing and reinforcement with metal stud manufacturer. Coordinate with partition types on drawings for depths and other required gauges.
 2. Dimpled Steel Studs and Runners:
 - a. Minimum base-metal thickness and depth: minimum 20 gauge except where otherwise noted on the Drawings.. Equivalent, properly documented by metal stud manufacturer. Coordinate required gauges, spacing and reinforcement with metal stud manufacturer. Coordinate with partition types on drawings for depths and other required gauges.
- C. Slip-Type Head Joints: Where indicated or where required by the nature of the construction, provide one of the following:
 1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Marinoware deflection track (dt).
 - 2) Approved equal.
 2. Slotted Track: ASTM E 119, ASTM 3 814, ASTM E 1966, ULCS115-M95 used at the head of wall. 1" total vertical movement providing positive attachment for wall framing. Slotted track is formed from prime steel.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Marinoware slotted track.
 - 2) Approved equal.
 3. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Dietrich metal framing (ot/tr series).
 - 2) Approved equal.
 4. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

- a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Superior Metal Trim; Superior Flex Track System (SFT).
 - 2) Approved equal.
- D. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
 - b. Approved equal.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
- F. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 1-1/2 inches minimum, except where otherwise indicated.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.033 inch.
 - 2. Depth: 1-1/2 inches except where otherwise indicated on Drawings.
- H. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical or hat shaped.
- I. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 3/4 inch.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch.
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- J. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 3/4 inch, minimum uncoated-metal thickness of 0.018 inch, and depth required to fit insulation thickness indicated.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Marinoware Z-furring channel (zf).
 - 2) Approved equal.

2.03 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges.
 - 1. Depth: 2-1/2 inches.
- D. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; Drywall Grid System.
 - c. USG Corporation; Drywall Suspension System.

2.04 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Extend all vertical ceiling and soffit supporting structure and suspension system supports to existing structure above.

3.03 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 1. Single-Layer Application: 16 inches o.c., coordinate with drawings.
 2. Multilayer Application: 16 inches o.c., coordinate with drawings.
 3. Tile backing panels: 16 inches o.c., coordinate with drawings.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb minimum. coordinate with door manufacturer.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: At all rated partitions, install to maintain continuity of fire-resistance-rated assembly indicated.
 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

- E. Direct Furring:
 - 1. Screw to wood framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Z-Furring Members:
 - 1. Erect insulation specified in Section 072100 "Thermal Insulation" vertically and hold in place with Z-furring members spaced 24 inches o.c.
 - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
 - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.04 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacing required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches o.c. coordinate with drawings.
 - 2. Carrying Channels (Main Runners): 48 inches o.c. coordinate with drawings.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Do not attach hangers to steel roof deck.
 - 5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.

- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 092600 GYPSUM BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board. Use moisture resistant gypsum board except where indicated where standard gypsum board is indicated.
- B. Related Requirements:
 - 1. Section 092210 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.
 - 2. Section 099000 "Painting and Coating" for primers and coatings applied to gypsum board surfaces.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.05 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned. Any gypsum board that becomes wet during construction shall be removed and replaced by the contractor at their expense.

- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.06 COORDINATION

- A. Light fixtures, mechanical diffusers, grilles, sprinkler heads and other ceiling mounted items: Coordinate size of openings required for ceiling mounted items in gypsum board ceilings with appropriate contractor and adjust ceiling grids and framing to accommodate such items.
- B. Coordinate with suspension grid system specified in Section 092210: Non-structural Metal Framing.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.02 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent. Provide gypsum panel products with 100% recycled content for face and liner papers
- B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site.
- C. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.03 INTERIOR GYPSUM BOARD

- 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. USG Corporation (Basis Of Design)
 - 2. Lafarge North America Inc.
 - 3. National Gypsum Company.

B. Gypsum Wallboard (WALLS): ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch.
2. Long edges: tapered.
3. Manufacturer:
 - a. USG "Imperial Gypsum Base"
 - b. approved equal

C. Moisture- and Mold-Resistant Gypsum Board. ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8 inch, Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10.
4. Manufacturer:
 - a. Usg "Mold Tough"
 - b. Approved Equal

2.04 ACCESSORIES

A. General: Comply with ASTM C 841 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Zinc and Zinc-Coated (Galvanized) Accessories:

1. Cornerite: Fabricated from expanded-metal lath with manufacturer's standard corrosion-resistant zinc coating, unless otherwise indicated.
2. Striplath: Fabricated from expanded-metal lath with manufacturer's standard corrosion-resistant zinc coating, unless otherwise indicated.
3. Corner Beads: Fabricated from zinc or zinc-coated (galvanized) steel.
 - a. Small nose corner bead with expanded flanges; use unless otherwise indicated.
 - b. Bull nose corner bead, radius 3/4 inch minimum, with expanded flanges; use at locations indicated on Drawings.
4. Casing Beads: Fabricated from zinc or zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
5. Control Joints: Fabricated from zinc or zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
6. Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
7. Two-Piece Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.

2.05 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper as recommended by the gypsum board manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
- a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.

2.06 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- D. Sound Attenuation Blankets: Batt type; fiberglass or mineral wool sized to match the nominal thickness of the partition; friction fitted between studs and in all voids in the wall assembly.
- E. Acoustical Sealant: As specified in Section 079000 - Joint Sealants.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.

- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.03 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. For new interior partitions, furred walls and where infilling or patching existing gypsum partitions.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
2. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.04 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions. Install according to ASTM C 841.
1. Corner Beads: Install at external corners.
 2. Casing Beads: Install at terminations of plasterwork, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.
 3. Control Joints: Install control joints at locations indicated on drawings.

3.05 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Pre-fill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

3.06 FINISH LEVEL SCHEDULE

- A. Level 1: Above finished ceilings concealed from view; including, but not limited to plenums and attics.
- B. Level 2: Areas behind cabinetry or other built in items which conceal the wall.
- C. Level 3: Walls in service or utility rooms, electrical closets, telephone equipment rooms, janitor closets and other non-habitable spaces. Walls scheduled to receive veneer plaster finish.

- D. Level 4: Walls and Ceilings in all finished spaces which are not scheduled for another finish level by the descriptions contained herein. Including, but not limited to walls and ceilings to be painted with flat or eggshell finishes or which are scheduled for wall coverings.
- E. Level 5: Walls and Ceilings scheduled to receive semi-gloss or gloss paint finishes and surfaces to be used for cove lighting applications or where lighting is focused directly onto gypsum surface:
- F. Soffits: Finish as indicated for Ceilings
- G. Fire Rated Assemblies: Provide finish level as indicated in schedule except where finish level requirements for fire rated assemblies are more restrictive, in which case the fire rated finish requirements shall govern.

3.07 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 095110 SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system tied into existing grid ceiling system.
- B. Acoustical units to match existing acoustical units

1.02 RELATED SECTIONS

- A. Section 079000 - Joint Sealers: Acoustical sealant.
- B. Division 23 – Mechanical: air outlets, diffusers, grilles
- C. Division 26 - Electrical: lighting fixtures, electrical devices, smoke/fire detectors

1.03 REFERENCES

- A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2000.
- B. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 1996.
- C. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2000.
- D. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 1998.
- E. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
- C. Product Data: Provide data on suspension system components.
- D. Samples: Submit three 6 x 6 inch samples illustrating material and finish of acoustical units. Provide three 6 x 6 inch samples of existing acoustical unit for purposes of matching new units.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.

- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.07 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust-generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

1.08 EXTRA MATERIALS

- A. See Section for Product Requirements, for additional provisions.
- B. Provide 2 percent of total acoustical unit area of each type of acoustical unit for Owner's use in maintenance of project.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Equal products from other manufacturers may be submitted for consideration
 - 2. Substitutions: See Product Requirements.
- B. Acoustical Panels Type lay in: ASTM E 1264 Type IV, painted faced mineral fiber, conforming to the following. *The indicated "product" is a general minimum specification since the new tiles are to match the existing. The actual tile submitted for review may deviate from these requirements if such a deviation is the result of providing an acceptable match of the new tile to the existing.
 - 2.
 - 1. Size: As indicated on Drawings.
 - 2. Thickness: 5/8 inches.
 - 3. Composition: mineral fiber, wet-formed.
 - 4. Weight: 1.40 lb/sq.ft.
 - 5. NRC: 0.10
 - 6. CSTC Minimum: 35.
 - 7. UL Labeled; Class A; Flame Spread 25 or under according to ASTM 1264 requirements.
 - 8. Smoke Development Rating: 50 or less according to ASTM E84 & ASTM 1264.
 - 9. Edge: Square.
 - 10. Surface Color: to match existing.
 - 11. Product*: "Fine-Fissured" Ceramaguard, by Armstrong.
 - a. The referenced product is indicated for bidding purposes, the actual tile shall be selected to match the existing acoustic tile units as determined by the Architect.
 - 12. Suspension System: Exposed grid Type exposed tee to match existing grid components and as indicated herein.

2.02 SUSPENSION SYSTEM

- A. Manufacturers:
 - 1. Any manufacturer who meets or exceeds the project requirements of tying into and existing suspension system.
- B. Suspension Systems - General: Minimum Requirements: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required. Provide system components that are compatible with and can tie into the existing ceiling grid that is to remain.
- C. Exposed Steel Suspension System Type Exposed Tee: Formed steel, commercial quality cold rolled; duty: to match existing.
 - 1. Finish: Match existing.

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid. Match existing profile..
- C. Adhesive: Henry 237 AcoustiGum Acoustical Ceiling Tile Adhesive
- D. Acoustical Sealant For Perimeter Moldings: Specified in Section 079000.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work. Verify details of existing ceiling assembly to determine requirements of new ceiling tie-in.
- B. Coordinate location of hangers and grid pattern with Mechanical or Electrical work.
- C. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected ceiling plan.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

- E. Support suspension system only from structural floor slab, beams, girders or joists. Do not support suspension system from ducts, mechanical equipment, electrical equipment, piping, finish materials or framework supporting other finishes
- F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant at acoustic partitions.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL (Tile) UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Follow grid pattern indicated on the drawings; coordinate with details at windows and other perimeter conditions.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- H. Where round obstructions occur, provide preformed closures to match perimeter molding.
- I. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions except where otherwise indicated.
- J. Where indicated on the Drawings, install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.
- K. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 096500 RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient base.
- B. Installation accessories for base.

1.02 RELATED SECTIONS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.03 REFERENCES

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 1997a.
- B. ASTM E 662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 1995.

1.04 PERFORMANCE REQUIREMENTS

- A. Conform to applicable code for fire performance ratings as follows:
 - 1. Classification: Class 1 as per ASTM E-648
 - 2. Critical radiant flux (CRF): Minimum 0.45 watt per square centimeter, per ASTM E 648.
 - 3. Flame spread: Maximum 75, per ASTM E 84.
 - 4. Smoke developed: Maximum 450, per ASTM E 84.
 - 5. Smoke density: Maximum 450, per ASTM E 662.

1.05 SUBMITTALS

- A. See Section on Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Verification Samples: Submit three samples, 12" long in size illustrating color .n for each vinyl base specified.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Protect roll materials from damage by storing on end.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.08 EXTRA MATERIALS

- A. See Section 016000 - Product Requirements, for additional provisions.
- B. Provide 50 lineal feet of each type of base and color specified.

PART 2 PRODUCTS

2.01 MATERIALS - BASE

- A. Resilient Base: ASTM F 1861, Type TV, vinyl, thermoplastic; top set Style A, Straight, and as follows:
 - 1. Height: 4 inch.
 - 2. Thickness: 0.080 inch thick.
 - 3. Finish: Satin.
 - 4. Length: Roll (minimum 80 feet long)
 - 5. Color: Color as selected from manufacturer's standards.
 - 6. Manufacturers:
 - a. Armstrong World Industries, Inc: www.ceiling.com.
 - b. Azrock Industries, Inc.
 - c. Tarkett, Inc: www.tarkett.com.
 - d. Kentile Floors Inc.
 - e. Congoleum Corporation
 - f. BurkeMercer Flooring Products, Inc: www.burkemercer.com.
 - g. Johnsonite, Inc: www.johnsonite.com.
 - h. Roppe Corp: www.roppe.com.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 ACCESSORIES

- A. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that partition and flooring work is ready for installation of base

3.02 PREPARATION

- A. Prepare base areas as required to provide proper substrate for base installation.
- B. Clean substrate.

3.03 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

- B. Miter internal corners. At external corners,'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
- C. Install base on solid backing, bond tightly to wall and floor surfaces.
- D. Scribe and fit to doorframes and other interruptions.

3.04 CLEANING

- A. Remove excess adhesive from base, and wall surfaces without damage.
- B. Clean base of any foreign substances in accordance with manufacturer's instructions.

3.08 PROTECTION OF FINISHED WORK

- A. Prohibit traffic in area of new base for 24 hours after installation.

END OF SECTION

SECTION 096700

FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-applied epoxy flooring.
- B. Cove base of fluid-applied epoxy where indicated on the Drawings.

1.02 REFERENCE STANDARDS

- A. ANSI/ESD STM7.1 - Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items - Floor Materials - Resistive Characterization of Materials; 2013.
- B. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.03 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of an epoxy based multi roller applied flooring system with Q28 or Q11 colored quartz aggregate and urethane topcoat. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/8 inch (Q28) or 3/16 inch (Q11). It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- B. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted.

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- C. Provide documentation of special warranties.
- D. Samples: Submit two samples, 12 by 12 inch (300 by 300 mm) in size illustrating color and pattern for each floor material for each color specified.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.
- G. Maintenance Materials: Furnish the following for Tenant's use in maintenance of project.
 - 1. Extra Flooring Material: 2 gallons (8 liters) of each color and product installed.

1.05 QUALITY ASSURANCE

- A. See Section 01400 – Quality Requirements for other quality project requirements.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section.
 - 1. Minimum 5 years of documented experience.
 - 2. Approved by manufacturer.
- D. Supervisor Qualifications: Trained by product manufacturer, under direct full time supervision of manufacturer's own foreman.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.07 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F (13 degrees C).
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fluid-Applied Flooring Systems
 - 1. Basis of Design Product: Dayton Superior Day-Chem Poxy Plus J-36 shall be provided where indicated on the Drawings. Floor must be scarified prior to coating application. System to include primer, base and top coat.
 - a. System Thickness: 40 mils (1 mm), nominal, when dry.
 - b. Colors: As indicated on the Drawings and/or Finish Schedule.
 - 2. Substitutions: See Section 01600 - Product Requirements.

2.02 ACCESSORIES

- A. Base Caps: Zinc with projecting base of 1/8 inch (3 mm); color as selected.
- B. Cant Strips: Molded of flooring resin material.
- C. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- D. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler. Scarify floor.
- B. Prepare concrete surfaces according to ICRI 310.2R.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.
- E. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - ACCESSORIES

- A. Install access panel recess frames.
- B. Install cant strips at base of walls where flooring is to be extended up wall as base.

- C. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.
- D. Install flooring in recessed type floor access covers.
- E. Cove at vertical surfaces.

3.05 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for additional requirements.
- B. Test installed floor surface in accordance with ANSI/ESD STM7.1 .

3.06 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 099000 PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. See Schedule - Surfaces to be finished as contained in this Section. Where a conflict may occur between the finish application in the specification and on the Drawings, the Drawings shall govern.

1.02 RELATED SECTIONS

- A. Section 081100 - Custom Steel Frames and Doors.
- B. Section 092600 – Gypsum Board

1.03 REFERENCES

- A. ASTM D 16 - Standard Terminology Relating to Paint, Varnish, Lacquer, and Related Products; 1996a.
- B. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 1997).

1.04 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products and referenced preparation and application procedures.
- C. Report by technical representative of the paint/coatings manufacturer regarding substrate conditions of new and existing materials
- D. Samples: Submit three sets of paper chip samples, 3 x 3 inch in size illustrating range of colors available for each surface finishing product scheduled.
 - 1. Report shall include test results of substrates for compatibility of existing coatings and primers with scheduled coatings and moisture content of substrates.
 - 2. Include recommendations for correcting unsuitable substrate conditions.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for products and finishes.
- B. Use products which comply with New Jersey Volatile Organic Compounds (VOC) Regulations

1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and other Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 EXTRA MATERIALS

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Supply 1 gallon of each color and type; store where directed.
- C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Paints, Primers and Preparation Materials:
 - 1. Base Manufacturer: Benjamin Moore & Co. except where otherwise indicated.
 - a. Equal and matching products of the following manufacturers may be submitted for review.
 - 2. ICI Paints North America. (Glidden)
 - 3. Sherwin-Williams Co. (Con-Lux)
 - 4. Pittsburgh Paints (PPG)
 - 5. Pratt and Lambert Paints.
- B. Substitutions: See Section 01600 - Product Requirements. Proposed substitutions shall match the color, finish and performance of the Base Manufacturer's Products.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. For good flow and brushing properties.
 - 3. Capable of drying or curing free of streaks or sags.
- B. Primers: Tint primers to approximate color of finish coat.
- C. Finish Coats: The number of finish coats for opaque coatings is a minimum. Provide additional coats to produce a uniform, opaque finish.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Exterior painting shall apply to previously painted areas of the exterior wall that are damaged, modified or otherwise affected by the work of this project. Exterior painting shall be performed to match the exterior finish in color and texture of the previously existing finish.
- B. Wood, Opaque, Alkyd, 3 Coat:
 - 1. One coat of alkyd primer sealer. Backprime surface concealed from view.
 - 2. Semi-gloss: Two coats of alkyd enamel.
- C. Ferrous Metals, Primed, Alkyd, 2 Coat: Primed Ferrous Metals including Exposed Structural Steel.
 - 1. Touch-up with zinc chromate primer as recommended by manufacturer.
 - 2. Gloss: Two coats of alkyd enamel; Impervo Enamel 133.
- D. Galvanized Metals, Alkyd, 3 Coat: Steel Doors, Frames, Rails and other Galvanized Ferrous Metals.
 - 1. One coat galvanize compatible primer as recommended by manufacturer.
 - 2. Gloss: Two coats of alkyd enamel; Impervo Enamel 133.

2.04 PAINT SYSTEMS - INTERIOR

- A. Wood, Opaque, Latex, 3 Coat: Shelving and other wood not indicated for staining, sealing, or fire retardant application.
 - 1. One coat of latex primer sealer as recommended by manufacturer.
 - 2. Previously Painted Surfaces: One coat of primer or barrier coating as recommended by manufacturer to provide appropriate substrate for scheduled finish coats.
 - 3. Semi-gloss: Two coats of latex enamel; Regal Aqua-Glo 333.
- B. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:

1. One coat of latex primer.
 2. Semi-gloss: Two coats of latex enamel; Regal Acqua-Glo 333.
- C. Ferrous Metals, Primed, Latex, 2 Coat: Steel Doors and Frames, Railings and other factory primed Ferrous Metals
1. Touch-up with primer compatible with factory primer as recommended by paint manufacturer.
 2. Previously Painted Surfaces: One coat of primer or barrier coating as recommended by manufacturer to provide appropriate substrate for scheduled finish coats.
 3. Semi-gloss: Two coats of latex enamel; Regal Aqua-Glo 333.
- D. Galvanized Metals, Latex, 3 Coat: Galvanized Steel Doors and Frames; Railings and other galvanized ferrous metals.
1. Use this system at exterior steel doors and frames which are scheduled for different colors or finish between the exterior side and interior side.
 2. One coat galvanize primer as recommended by manufacturer.
 3. Previously Painted Surfaces: One coat of primer or barrier coating as recommended by manufacturer to provide appropriate substrate for scheduled finish coats.
 4. Semi-gloss: Two coats of latex enamel; Regal, Aqua-Glo.
- E. Gypsum Board Epoxy Enamel, 3 Coat: Toilet Rooms, Utility Rooms
1. One coat of catalyzed epoxy primer as recommended by manufacturer.
 2. Gloss: Two coats of catalyzed epoxy enamel; Tile-Like Catalyzed Epoxy Coatings 378 two part coating with semi-gloss clear hardener.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Representative of the Paint/coatings Manufacturer shall prepare a report describing new and existing surfaces with recommendations of the appropriate primer and barrier coats.
1. Report shall identify any conditions which shall require preparation procedures other than typical procedures.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
1. Results of testing shall be included in report by paint/coatings representative.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster and Gypsum Wallboard: 12 percent.
2. Interior Wood: 15 percent, measured in accordance with ASTM D 4442.
3. Exterior Wood: 15 percent, measured in accordance with ASTM D 4442.

3.02 PREPARATION

- A. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- C. Marks: Seal with shellac those which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- H. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- I. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- J. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces, areas where holes were drilled or cut to install hardware or similar items.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Sprayed applications are not permitted.
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

- E. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- F. Sand wood surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to appropriate sections in Divisions 15 and 16 for schedule of color coding of equipment, duct work, piping, and conduit.
- B. Paint shop-primed equipment, where indicated.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.
- C. Inspect and test questionable coated areas in accordance with manufacturer's recommendations.
 - 1. Contractor shall perform paint testing

3.06 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 SCHEDULE - SURFACES TO BE FINISHED

- A. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically noted.
 - 2. Fire rating labels, equipment serial number and capacity labels.
 - 3. Stainless steel items.
- B. Paint the surfaces described below under Schedule - Paint Systems.
- C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
 - 1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
 - 2. Paint shop-primed items occurring in finished areas.
 - 3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one, opaque, coat of flat black, non specular paint to visible surfaces.
 - 4. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets flat, non-specular black.

- D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

3.08 SCHEDULE - PAINT SYSTEMS

- A. Concrete, Concrete Block, Masonry: Finish all surfaces exposed to view.
 - 1. Interior: semi-gloss or epoxy
- B. Gypsum Board: Finish all surfaces exposed to view.
 - 1. Interior Ceilings: Flat
 - 2. Interior Walls and Soffits: semi-gloss.
- D. Wood: Finish all surfaces exposed to view.
 - 1. Exterior trim, fascias and soffits: Semi-gloss
 - 2. Interior trim and frames: semi-gloss.
- E. Steel Doors and Frames: Finish all surfaces exposed to view, semi-gloss for interior. gloss for exterior.
- G. Steel Fabrications: Finish all surfaces exposed to view.
 - 1. Exterior: gloss; finish all surfaces, including concealed surfaces, before installation.
- H. Galvanized Steel: Finish all surfaces exposed to view.
 - 1. Exterior: gloss
 - 2. Interior: semi-gloss
- I. Shop-Primed Metal Items: Finish all surfaces exposed to view.
 - 1. Finish the following items:
 - a. Exposed surfaces of lintels.
 - b. Exposed surfaces of steel stairs and railings.
 - c. Exposed structural steel columns and beams.
- J. Plywood for Electrical Panels and Equipment: low luster, finish all surfaces exposed to view with intumescent paint; Black
- K. Pipe and Duct Insulation Jackets: Finish all surfaces exposed to view; semi-gloss.

3.09 SCHEDULE - COLORS

- A. Architect to provide color schedule after submittals for this section are accepted

END OF SECTION

SECTION 101400

SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. ADA signs.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.04 QUALITY ASSURANCE

- A. See Section 01400 – Quality Requirements for other quality project requirements.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- C. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 INTERIOR SIGNAGE

- A. Refer to Drawings for locations, descriptions and details.
- B. Toilet Rooms: Provide handicap ADA compliant signage.

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
 - 1. Mount on outside wall in location indicated on Drawings.

2.03 MANUFACTURERS AND PRODUCTS

- A. Any manufacturer whose products comply with the specifications and the requirements on the Drawings.
- B. Signage Description: "Standard Word & Picture" signs with text and raised or engraved symbols.

- a. Sign Body: "MP" plastic with two-color, scratch resistant, non-static, fire retardant, washable melamine laminate with non-glare surface over brown phenolic core.
 - b. Font: Standard Medium, copy raised 1/32" and minimum 5/8" high.
 - c. Braille: Grade 2.
 - d. Size: 8" x 8" except if indicated otherwise on the Drawings

2.04 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify and coordinate signage and the approved signage shop drawings prior to installation.
- A. Install as located and detailed on the Drawings.
- B. Install in accordance with manufacturer's instructions.
- C. Install neatly, with horizontal edges level.
- D. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- E. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 101700 PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.
 - 1. Overhead braced, floor-mounted system as shown on Drawings.

1.02 RELATED SECTIONS

- A. Section 061000 - Rough Carpentry: Concealed wood framing and blocking for compartment support.
- B. Section 108010 - Toilet Accessories and Shower Enclosure.

1.03 REFERENCES

- A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 1996b.

1.04 SUBMITTALS

- A. See Section 01300 – Administrative Requirements for Submittal Procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 WARRANTY

- A. Manufacturer's 15-year warranty against breakage and corrosion for material replacement.
- B. Contractor's warranty as indicated in the General Conditions and Supplementary Conditions also applies.

1.06 COORDINATION

- A. Coordinate partitions with Plumbing work
- B. Coordinate the work with placement of support framing and anchors in wall.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plastic Toilet Compartments – Basis of Design: This Section includes products as manufactured by Santana Products Co. Inc.
- B. Products which are of equivalent quality, design, color selection, appearance and function by the following manufacturer may be submitted:
 - 1. ASI Accurate Products, Inc
 - 2. Capitol Partitions, Inc
 - 3. Or other manufacturers who meet or exceed the project requirements and the Basis of Design product.

2.02 FIRE RESISTANCE REQUIREMENTS

- A. Furnish products which comply with the following minimum requirements
 - 1. Smoke Developed: 15 or less as per ASTM D2843
 - 2. Self-Ignition: 650 deg. F or greater as per ASTM D1929 - 77
 - 3. Rate of Burn: less than 2.0 cm/min. as per ASTM D635-81

2.03 COMPONENTS

- A. Toilet Compartments: Solid molded HDPE plastic panels, doors, brackets, shoes and pilasters, floor-mounted headrail-braced.
 - 1. Color: as selected from manufacturer's standards for series listed below.
 - a. Colors for components may be selected from one or more of the following: Designer Series, "Poly-Marble HD" or "Poly-Granite HD".
- B. Door and Panel Dimensions:
 - 1. Thickness: 1 inch.
 - 2. Door Width: 24 inch except where indicated otherwise.
 - 3. Door Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: 58 inch.
 - 5. Thickness of Pilasters: 1 inch.
- C. Urinal Screens: Wall mounted with continuous panel brackets; size as shown on drawings.

2.04 ACCESSORIES

- A. Pilaster Shoes: solid plastic; concealing floor fastenings and adjusters.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
 - 2. Provide ceiling attachment using two adjustable hanging studs, attached to above-ceiling framing.
- B. Brackets: For connections between panels, pilasters and walls; solid plastic channels with one or two legs depending upon connection conditions.
- C. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- D. Hardware: Polished chrome plated non-ferrous cast metal:
 - 1. Integral, concealed hinges, gravity type, with nylon cam and stainless steel insert; two per door.
 - 2. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door

- latch.
- 3. Coat hook with rubber bumper; one per compartment, mounted on door.
- 4. Provide door pull for outswinging doors.
- E. Overhead Brace: Anodized aluminum; grab-resistant design with polished stainless steel brackets.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements and conditions are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify that blocking bracing and anchorage built into partitions complies with manufacturer's requirements and warranty requirements.
- D. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attached panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster centerlines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 ERECTION TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return outswinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 108010 TOILET ACCESSORIES and SHOWER ENCLOSURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Accessories for toilet rooms.
- B. Pipe insulation for barrier free lavatories
- C. Grab bars.
- D. Shower Enclosures with accessories.

1.02 RELATED SECTIONS

- A. Section 061000 - Rough Carpentry: Blocking.
- B. Section 101700 - Plastic Toilet Compartments.
- C. Division 22 – Plumbing; Domestic water and sanitary piping connections.

1.03 REFERENCES

- A. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 1997a.
- B. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 1996.
- C. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 1996b.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 1991 (Reapproved 1997).
- E. FS DD-M-411 - Mirrors, Glass; Federal Specifications and Standards; Revision C, 1990.

1.04 SUBMITTALS

- A. See Section 01300 – Administrative Requirements: Submittal Procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Shop Drawings: Shower enclosure and accessories
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.05 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

- B. Coordinate plumbing interface with shower enclosure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Products for Toilet Accessories are listed on the Toilet Accessory Schedule are made by Bobrick Washroom Equipment Inc.
1. Products which are of equivalent quality, design, appearance and function by the following manufacturer may be submitted:
- American Specialties, Inc.
 - Bradley Corp.
2. Shower enclosure manufacturer shall be as specified elsewhere in this Section.
- D. Shower Enclosure: Any domestic manufacturer whose ADA compliant products meet the requirements of this Section including ADAAG compliant accessories.
1. Basis of Design Manufacturer and Product: Manufacturer: Freedom Showers; freedomshowers.com; 1-877-947-7769. Model APFQ3682B75 with accessories as indicated.
- Size: interior dimensions: 36" x 36"; exterior dimensions 39" x 37.5" x 82.125" with $\frac{3}{4}$ " high ADA compliant tapered threshold.
 - Assembly: One piece molded acrylic with integral soap ledges; reinforced for accessory attachments and general stability. Fabricate with gypsum board receiver flanges. Textured slip resistant floor. Shower enclosure hand as shown on Drawings.
 - Color: White
 - Accessories – ADAAG compliant:
 - Grab bars: Stainless steel; 24"L x 1.25"Dia. vertical bar; 18" x 33.5" x 1.25" Dia. horizontal "L" grab bar.
 - Caulkless drain with SS cover; center location
 - Folding shower seat; 250 lb capacity.
 - Stainless steel or anodized aluminum shower rod with flame resistant weighted mold resistant curtain.
 - Mfr. Pressure balanced valve with hand held shower head and vertical slide bar.
 - Field mount soap dispenser specified elsewhere in this section to shower wall at ADA compliant height and location. Mount with high bond strength adhesive strips. Do not use mechanical fasteners.
 - Warranty: Manufacturer's standard 30 year limited warranty.
- C. Where products are specified without identifying a manufacturer, provide product which complies with the requirements and as indicated on the drawings.
- Substitutions: Section 01600 - Product Requirements.
 - All items of each type to be made by the same manufacturer.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- Grind welded joints smooth.

- 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide four keys for each accessory to Owner; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A 666, Type 304.
- D. Stainless Steel Tubing: ASTM A 269.
- E. Float glass mirror with: type 304 stainless steel frame. Size as shown on the Drawings.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type, torx head center pin reject type.
- G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Galvanizing for Items other than Sheet: ASTM A 123/A 123M to 1.3-oz/sq yd. Galvanize ferrous metal and fastening devices.
- C. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- D. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 TOILET ROOM ACCESSORIES

Refer to Drawings for locations of items included in this Section.

- A. Toilet Paper Dispenser:
 - 1. Jumbo-roll toilet paper dispenser, surface mounted, 18-8 S, type 304, 20 gauge cabinet, steel; with tumbler lock. 18 gauge door, 18-8 S, type 304, satin stainless steel; one-piece seamless construction; wide viewing slot revealing toilet tissue supply. Concealed wall mounting.
 - 2. Dispensing System: Dispensing system shall be high-impact ABS and shall accommodate two toilet tissue rolls up to 10" diameter with 3" diameter core; and equipped with a sliding access panel that exposes one roll at a time. Spindles shall be convertible in the field to dispense 2-1/4" diameter core rolls.
 - 3. Product: B-2892 manufactured by Bobrick.
- B. Sanitary Napkin Disposal
 - 1. Surface mounted container and cover shall be 18-8 S, type 304, 22 gauge stainless steel. Exposed surfaces shall have satin finish. Cover to be secure to container with a full length stainless steel piano hinge.
 - 2. Product: Series B-270 manufactured by Bobrick.
- C. Pipe Insulation at Lavatories: Application: At all barrier free lavatories and sinks not in built-in cabinetry.
 - 1. Flexible molded closed cell vinyl insulation components which enclose waste lines, traps and shut off valves. Fasteners: Nylon. Paintable; Burning Characteristics: self-extinguishing as per ASTM D635
 - 2. Complies with ADA, article 4.19.4 ANSI A117.1 and BOCA article P-1203.4
 - 3. Product: 'Handi-Lav-Guard' Model: 102G manufactured by Truebro Inc. or equal.

- D. Soap Dispenser:
 - 1. Liquid soap dispenser, surface mounted, 20 gauge, one piece, satin stainless steel construction; push type soap valve, unbreakable window gage refill indicator, with lock. Concealed wall mounting.
 - 2. Minimum Capacity: 40 ounces.
 - 3. Product: B-4112 "Contura" manufactured by Bobrick.
 - 4. Provide one soap dispenser in Shower Enclosure. See Shower enclosure specification in the Section for special mounting requirements.
- E. Mirrors: All locations where indicated.
 - 1. Size: As indicated on drawings.
 - 2. Secure to wall with tamper-resistant mounting screws or other means as recommended by the manufacturer.
- F. Grab Bars: Type 304 stainless steel, 18 gauge, 1-1/4 inches outside diameter, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar. (2-36" and 6-42" total)
 - 1. For all applications of grab bars in toilets rooms.
 - 2. Length and configuration: As indicated on drawings.
- G. Hand Dryer: All locations where indicated
 - 1. Refer to electrical specification for information.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work. Verify that rough framing at shower enclosure will accommodate shower enclosure.
- B. Verify exact location of accessories for installation.
- C. Verify locations of items to be installed by the Owner to coordinate blocking installation.
- D. Install accessories following the dimensional requirements shown on the Drawings.
- E. Verify that field measurements are as indicated on drawings.
- F. See Sections 061000 and the Drawings for installation of blocking, reinforcing plates, and concealed anchors in walls.
 - 1. Verify that preparations, blocking and reinforcing is in place and is correct.

3.02 PREPARATION

- A. Install blocking in stud walls for all wall mounted Toilet Accessories included in this Section and for items to be furnished by the Owner. Advise the Owner of locations of blocking installed for Owner furnished accessories.
- B. Install in CMU walls with masonry anchors for all wall mounted Toilet Accessories included in this Section and for items to be furnished by the Owner.
- C. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: as indicated on drawings
 - 1. Install accessories in compliance with CABO/ANSI A117.1 and the Americans with Disabilities Act (ADA).
 - 2. Should the drawings conflict with the requirements of CABO/ANSI A117.1 and ADA, the requirements of CABO/ANSI A117.1 and ADA shall govern.
- C. Install pipe insulation on exposed supply and waste piping at barrier free lavatories.
- D. Install shower enclosure in compliance with manufacturer's installation requirements. Provide blocking and miscellaneous construction as required for a proper installation. Apply mold-resistant silicone sealant, as recommended by the shower enclosure manufacturer to entire perimeter joint between enclosure and surrounding finishes. Apply sealant at plumbing penetrations.
 - 1. Install unit plumb and coordinate drain and water supply locations.
 - 2. Coordinate installation with plumbing work.

END OF SECTION

SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

1.01 SCOPE AND INTERPRETATION

- A. These Specifications and accompanying Drawings provide for the furnishing, setting and connection of the installation of drainage and water supply systems.
- B. The specifications and Drawings require the Contractor to provide all labor, materials, equipment and appliances to perform of all Work pertaining or incidental thereto, which is needed to complete the Work shown on the Drawings and called for in the Specifications.
- C. The complete systems and the Work shall be so installed as to give proper and continuous service under all conditions, and shall be in accordance with the requirements of all public authorities having jurisdiction and to the complete satisfaction of the Owner. Any Work shown on the Drawings and not particularly described in the specifications, or vice versa or any Work which may be deemed necessary to complete the Contract shall be provided by the Contractor as part of its Contract.
- D. For purposes of clearness and legibility, plumbing Drawings are essentially diagrammatic and size and location of equipment are drawn to scale wherever possible. The Drawings indicate size, connection points and routes of pipe. It is not intended, however, that all offsets, rises and drops are shown. Provide piping as required to fit structure, avoid obstruction, and retain clearances, headroom openings and passageways.
- E. Fixtures shown and described on the Drawings shall be connected with waste, vent and water supply piping in accordance with the requirements of New York State Building Code, despite the omission of indication of such piping on the plans. Any question involving the installation of such piping shall be referred to the Engineer for resolution.
- F. Scope of Work: The plumbing and drainage work of this contract shall include but shall not be limited to the following systems, equipment and services:
 - 2. Equipment furnished under other Sections of this Contract: Including fire protection equipment shall be piped.
 - 3. Piping, Equipment Supports, and seismic restraints: To comprise all restraints, hangers, pipe guides, rods, beam clamps, brackets, pipe anchors, other attachments, floor flanges, masonry anchors, bolts, nuts, washers, and other items as required to fully support all piping and equipment installed under this contract inclusive of spring hangers, seismic restraints, and vibration mounts where recommended by equipment manufacturers, where required to meet noise abatement regulations and as necessary to prevent piping and equipment vibrations being transmitted to structure.
 - 4. Provide unions and stop valves at all equipment connections and where required for service, repairs and draining.

5. Piping - General: Piping, Piping installation or hook-up shall mean a complete installation in all respects including pipe, fittings, valves, unions, traps, strainers, specialties and other miscellaneous items to make piping systems and equipment operational.
6. Painting and Identification: As specified in their respective sections of this Contract.
7. Miscellaneous Work: Included shall be all items of materials, piping, controls, wiring and other miscellaneous items not specifically shown on Contract Drawings or called for herein but which are normally furnished and required for a complete installation of this type.
8. Sealing of Openings: Openings left in walls, floors, ceilings or partitions shall be sealed. Finish shall match existing adjoining finish in all respects.
9. Coordination Drawings: The plumbing contractor shall cooperate with the Fire Protection Systems, and Electrical contractors in the development of the coordination drawings. The specified order in which the various trade contractors impose their work on the coordination drawings is not intended to grant priority to any one trade contractor in the allocation of space. At the completion of this phase, hold a coordination meeting to eliminate any interference among the trades that the drawings indicate and to avoid any conflicts in installing the Work.

1.02 CODES AND STANDARDS

- A. It shall be unlawful for any person to perform the work referred to under this Plumbing and Drainage Specifications and/or shown on the Plumbing and Drainage Contract Drawings unless such person is a licensed master plumber, partnership, corporation or other business association as permitted by the New York State Building Code and unless such work is performed under the direct and continuing supervision of a licensed master plumber.
- B. Where requirements for products, materials, systems, equipment, methods and other portion of the work specified herein exceed minimum requirements of regulatory agencies having jurisdiction over the construction work, contractor shall comply with such requirements specified herein, unless specifically approved otherwise by the Owner.

1.03 TORCH BURNING OPERATION

- A. The storing and use of oxygen and combustible gases in conjunction with torch burning apparatus is subject to the Rules and Regulations of the New York State Building and Fire Code. Fire watches shall be provided during all operations using torches for burning, cutting or welding.
- B. The cost of permits, certificates, fire watches, apparatus and other items required in the torch burning operation shall be borne by the Contractor at no additional cost to the Owner.

1.04 PROTECTION OF MATERIALS AND WORK

A. Existing Building

1. Open ends of piping shall be temporarily closed by a proper fitting, until piping is approved and ready for service.
2. Equipment and other items shall be protected during the progress of the Work. When the building is practically complete and ready for use the fixtures and other items shall be cleaned and all metal work polished and the entire installation put in perfect working order.

1.05 GUARANTEES AND WARRANTIES

- A. The Requirements of Section G01740 and this Article shall apply to Guarantees and Warranties.
- B. Contractor's Guarantees: The Contractor guarantees that all Work of this Contract is free from all defects, and is as specified, and that should any defects, which cannot be proven to have been caused by improper use, develop within the space of one year from the date of substantial completion of the Work, such defects shall be made good by the Contractor, free of cost to the Owner.

1.07 OPENINGS AND CHASES

- A. Openings through exterior foundation walls shall be made watertight by the Contractor after pipes, conduits and other items passing through the wall have been installed. This building is planned and detailed, and is the intent of these specifications to provide a structure that will prevent the penetration by rodents and vermin of any vacant space where they might find a harborage. The Contractor will be held responsible for securing this condition by the closing of all points of access to such spaces, including the passage of piping and conduits, through all walls, partitions, ceilings and furred out spaces, the closing of access to voids in hollow tile or cinder blocks. There shall be a special inspection of the building with regard to this matter before final acceptance.

1.08 INSTRUCTION OF STAFF

- A. After the plumbing, drainage systems have been tested, and fixtures, apparatus and all other items adjusted and operating properly to the satisfaction of the Owner, Contractor shall furnish a competent person to instruct the staff in the operation and maintenance of the systems. Contractor shall video record all the training sessions for various equipment and systems as specified in individual sections of these Specifications. Determination of the date and time of such instruction shall be under the direction of the Owner.

1.10 SUBMITTALS

- A. Formal submission for approval of manufacturer is required as per manufacturer/model number or series listed in the specification. Formal submissions are required for materials and appurtenances (ex. sheet metal, pipes, etc.) as defined in the

specification. Submittals are always required to verify capacity. Schedules, installation instructions, startup manuals, operation and maintenance manuals, and shop drawings are always required to be submitted.

1.11 CLEANING AND REPAIR

- A. At the completion of the Work and before the final inspection is made the Contractor shall thoroughly clean all apparatus, appurtenances, piping, and leave these items free from all marks, scratches, stains, and other damage. All equipment shall be cleaned and left in condition to operate, and the work, as a whole, left in perfect working order. Remove all tools, debris and excess materials from the premises.
- B. Contractor shall not leave sharp exposed metal edges (bottom of threaded rods, P&D equipment supports, etc.) that could otherwise present safety hazards to the building's occupants/work staff.

END OF SECTION

SECTION 22 05 23

VALVES

PART 1 GENERAL

1.01 ABBREVIATIONS

- A. IBBM: Iron body, bronze mounted.
- B. OS&Y: Outside screw and yoke.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's catalog sheets and specifications for each valve type.

1.03 MAINTENANCE

- A. Special Tools:
 - 1. One wrench for each type and size wrench operated plug valve.

PART 2 PRODUCTS

2.01 VALVES - GENERAL

- A. Valve Standardization: Valves from one or more manufacturers may be used, however valves supplied for each specific valve type shall be the product of one manufacturer.
- B. Valves shall be first quality, free from all imperfections and defects, with body markings indicating manufacturer and rating.
- C. Valve parts of same manufacturer, size and type shall be interchangeable.
- D. Manually operated gate, globe and angle valves shall be of rising stem type, unless otherwise specified.
- E. Valves which use packing, shall be capable of being packed when wide open and under full working pressure.
- F. Size valves the same size as the piping in which they are installed, unless specified otherwise.

2.02 GATE VALVES

- A. 125 psig WSP, 200 psig WOG up to 12 inch size, and 150 psig WOG for 14 inch and 16 inch sizes; IBBM OS&Y, bolted bonnet, solid wedge disc,

and threaded or flanged ends depending on size. Acceptable Valves: Crane 464-1/2, 465-1/2, Hammond IR1140, Milwaukee F2885, Nibco T6170 & F6170, and Stockham G620 & G623

2.03 GLOBE AND ANGLE VALVES

N/A

2.04 CHECK VALVES

- A. 125 psig WSP, 200 psig WOG, IBBM, horizontal swing, bolted bonnet, regrindable and renewable seat ring and disc, and threaded or flanged ends depending on size. Discs on valves 4 inch size and larger may be cast iron with bronze face. Acceptable Valves: Crane 372, & 373, Hammond IR1124, Jenkins 623CJ & 624CJ, Milwaukee F2974, Nibco F918, and Stockham G927 & G931.

2.05 PLUG VALVES

N/A

2.06 BUTTERFLY VALVES

N/A

2.07 WATER PRESSURE REDUCING VALVES

N/A

2.08 SAFETY AND RELIEF VALVES

N/A

2.09 NEEDLE STOP VALVES

N/A

2.10 GAGE COCKS

N/A

2.11 BALL VALVES

- A. 150 psig WSP, 600 psig WOG, 2 piece bronze body, solid blow-out proof stem, teflon seats, chrome plated brass ball, teflon seals, corrosion resistant steel lever handles with vinyl grips, balancing stop, and threaded

or solder ends. Acceptable Manufacturers: Conbraco, Hammond, Milwaukee, Nibco, and Watts.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Install valves at locations noted on the drawings or specified.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 05 29

PIPE HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Companion high density filler pieces for installation over the top 180 degree surface of pipe or tubing, at points of support where a combination clevis hanger, insulation shield and high density insulating saddle are installed.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. N/A

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Details of trapeze hangers and upper hanger attachments for piping 4 inches in diameter and over. Include the number and size of pipe lines to be supported on each type of trapeze hanger.
 - 2. Details of pipe anchors.
 - 3. Details and method of installing sway braces for cast iron soil pipe.
- B. Product Data: Catalog sheets, specifications and installation instructions for each item specified except fasteners.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with the applicable requirements of the ASME B31 Piping Codes.
 - 2. Unless otherwise shown or specified, comply with the requirements of the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58, and SP-69.
 - 3. Materials for use in Sprinkler Systems and Standpipe and Hose Systems shall comply with the requirements of NFPA 13 and NFPA 14 as applicable.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddle with companion high density filler piece.

1. Insulating saddles and filler pieces shall be of the same thickness and materials as the adjoining pipe insulation. Saddles shall cover the lower 180 degrees of the pipe or tubing, and companion filler pieces shall cover the upper 180 degrees of the pipe or tubing. Physical sizes, gages, etc. of the components of insulated hangers shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE	SADDLE LENGTH (Inches)	VAPOR BARRIER JACKET LENGTH (Inches)
Up to 2-1/2	4	16	6	10

- B. Pipe Insulation Shields: Fabricated of steel, with a minimum arc of 180 degrees, unless otherwise indicated. Shields for use with hangers and supports, with the exception of combination clevis type hangers, shall be in accordance with the following schedule:

PIPE OR TUBING SIZE (Inches)	SHIELD LENGTH (Inches)	SHIELD GAGE
Up to 2-1/2	8	18

- C. Pipe Covering Protection Saddles: 3/16 inch thick steel, of sufficient depth for the insulation thickness specified, notched so that saddle contact with the pipe is approximately 50 percent of the total axial cross section. Saddles for pipe 12 inches in size and larger shall have a center support.
- D. Pipe Hangers: Height adjustable standard duty clevis type, with cross bolt and nut.
 1. Pipe spreaders or spacers shall be used on cross bolts of clevis hangers, when supporting piping 10 inches in size and larger.
 2. Swivel ring type hangers will be allowed for sprinkler piping up to a maximum of 2 inches in size.
- E. Adjustable Floor Rests and Base Flanges: Steel.
- F. Hanger Rods: Mild, low carbon steel, fully threaded or threaded at each end, with two nuts at each end for positioning rod and hanger, and locking each in place.
- G. Riser Clamps: Malleable iron or steel.

2.02 ANCHORS AND ATTACHMENTS

- A. Sleeve Anchors (Group II, Type 3, Class 3): Molly's Div./USM Corp. Parasleeve Series, Ramset's Dynabolt Series, or Red Head/Phillips AN, HN, or FS Series.

- B. Wedge Anchors (Zinc Plated, Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly's Div./USM Corp. Parabolt PB Series, Ramset's Trubolt T Series, or Red Head/Phillips WS Series.
- C. Self-Drilling Anchors (Group III, Type 1): Ramset's RD Series, or Red Head/Phillips S Series.
- D. Non-Drilling Anchors (Group VIII, Type 1): Ramset's Dynaset DS Series, Hilti's HDI Series, or Red Head/Phillips J Series.
- E. Stud Anchors (Group VIII, Type 2): Red Head/Phillips JS Series.
- F. Beam Clamps: Forged steel beam clamp, with weldless eye nut (right hand thread), steel tie rod, nuts, and washers, Grinnell's Fig No. 292 (size for load, beam flange width, and rod size required).
- G. Metal Deck Ceiling Bolts: B-Line Systems' Fig. B3019.
- H. Continuous Slotted Type Concrete Insert, Galvanized:
 - 1. Load Rating 800 lbs/ft: Kindorf's D-986.
 - 2. Load Rating 1500 lbs/ft: Kindorf's D-980.
 - 3. Load Rating 3000 lbs/ft: Hohmann & Barnard's Inc. Type CS-H.
 - 4. Load Rating 4500 lbs/ft: Hohmann & Barnard's Inc. Type CS-HD.
- I. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded to receive 3/4 inch diameter machine bolts.
- J. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept 3/4 inch diameter bolts having special wedge shaped heads.

2.03 FASTENERS

- A. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for high humidity locations, and treated wood; plain finish for other interior locations. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work.

2.04 SHOP PAINTING AND PLATING

- A. Hangers, supports, rods, inserts and accessories used for pipe supports, unless chromium plated, cadmium plated or galvanized shall be shop coated with metal primer paint. Electroplated copper hanger rods, hangers and accessories may be used with copper pipe or copper tubing.
- B. Hanger supports for chromium plated pipe shall be chromium plated brass.

PART 3 EXECUTION

3.01 PREPARATORY WORK

- A. Place inserts into construction form work expeditiously, so as not to delay the Work.

3.02 INSTALLATION

- A. Do not hang or support one pipe from another or from ductwork.
1. Do not bend threaded rod.
- B. Support all insulated horizontal piping conveying fluids below ambient temperature, by means of hangers or supports with insulation shields installed outside of the insulation.
- C. Space hangers or supports for horizontal piping on maximum center distances as listed in the following hanger schedules, except as otherwise specified, or noted on the Drawings.
1. For Steel, and Threaded Brass Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1 and under	8
1-1/4 and 1-1/2	9
2	10
2-1/2 and up	12

2. For Copper Pipe and Copper Tubing:

PIPE OR TUBING SIZE (Inches)	MAXIMUM SPACING (Feet)
1-1/2 and under	6
2 and over	10

3. For Directional Changes: Install a hanger or support close to the point of change of direction of all pipe runs in either a horizontal or vertical plane.
4. For Concentrated Loads: Install additional hangers or supports, spaced as required and directed, at locations where concentrated loads such as in-line pumps, valves, fittings or accessories occur, to support the concentrated loads.
5. For Branch Piping Runs and Runouts Over 5 feet In Length: Install a minimum of one hanger, and additional hangers if required by the hanger spacing schedules.
6. Parallel Piping Runs: Where several pipe lines run parallel in the same plane and in close proximity to each other, trapeze hangers may be submitted for approval. Base hanger spacing for trapeze type hangers on the smallest size of pipe being supported. Design the entire hanger assembly based on a safety factor of five, for the ultimate strength of the material being used.

9. Support floor drain traps from the overhead construction, with hangers of type and design as required and approved. Overhead supports are not required for floor drain traps installed directly below earth supported concrete floors.

D. Size hanger rods in accordance with the following:

PIPE OR TUBING SIZE (Inches)	SINGLE ROD HANGER SIZE (Inches)		DOUBLE ROD HANGER SIZE (Inches)	
	PIPE	TUBING	PIPE	TUBING
1/2 to 2	3/8	1/4	3/8	1/4
2-1/2 and 3	1/2	3/8	3/8	1/4

1. Size hanger rods, for piping over 12 inches in size and multiple line supports, based on a safety factor of five for the ultimate strength of the materials being used.
2. Secure hanger rods as follows: Install one nut under clevis, angle or steel member; one nut on top of clevis, angle or steel member; one nut inside insert or on top of upper hanger attachment and one nut and washer against insert or on lower side of upper hanger attachment. A total of four nuts are required for each rod, two at upper hanger attachment and two at hanger.

E. Vertical Piping:

1. Support vertical risers of piping systems, by means of heavy duty hangers installed close to base of pipe risers, and by riser clamps with extension arms at intermediate floors, with the distance between clamps not to exceed 25 feet, unless otherwise specified. Support pipe risers in vertical shafts equivalent to the aforementioned. Install riser clamps above floor slabs, with the extension arms resting on floor slabs. Provide adequate clearances for risers that are subject to appreciable expansion and contraction, caused by operating temperature ranges.
2. Support extension arms of riser clamps, secured to risers to be insulated for cold service, 4 inches above floor slabs, to allow room for insulating and vapor sealing around riser clamps.
3. Install intermediate supports between riser clamps on maximum 6 foot centers, for copper tubing risers 1-1/4" in size and smaller, installed in finished rooms or spaces other than mechanical equipment machine or steam service rooms, or penthouse mechanical equipment rooms.
4. Support cast iron risers, by means of heavy duty hangers installed close to the base of the pipe risers, and 1/4 inch thick malleable iron or steel riser clamps with extension arms at each floor level, with the distance between clamps not to exceed 25 feet. Support cast iron risers in vertical shafts equivalent to the aforementioned.
5. Support hubless cast iron risers, by means of heavy duty hangers installed close to the base of the pipe risers, and by malleable iron

or steel riser clamps with the extension arms at each floor level, with the distance between clamps or intermediate supports not to exceed 12 feet. Support risers in vertical shafts equivalent to the aforementioned.

- F. Floor Supports: Install adjustable yoke rests with base flanges, for the support of piping, unless otherwise indicated on the Drawings. Install supports in a manner, which will not be detrimental to the building structure.
- G. Underground Cast Iron Pipe Supports: Firmly bed pipe laid underground, on solid ground along bottom of pipe. Install masonry piers for pipe laid in disturbed or excavated soil or where suitable bearing cannot be obtained. Support pipe, laid proximate to building walls in disturbed or excavated soil, or where suitable bearing cannot be obtained, by means of wall brackets or hold-fasts secured to walls in an approved manner.

3.03 UPPER HANGER ATTACHMENTS

- A. General:
 - 1. Secure upper hanger attachments to overhead structural steel, steel bar joists, or other suitable structural members.
 - 2. Do not attach hangers to steel decks that are not to receive concrete fill.
 - 3. Do not attach hangers to precast concrete plank decks less than 2-3/4 inches thick.
 - 4. Do not use flat bars or bent rods as upper hanger attachments.
- B. Attachment to Steel Frame Construction: Provide intermediate structural steel members where required by pipe support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of five.
 - 1. Do not use drive-on beam clamps.
 - 2. Do not support piping over 4 inches in size from steel bar joists. Secure upper hanger attachments to steel bar joists at panel points of joists.
 - 3. Do not drill holes in main structural steel members.
 - 4. Beam clamps, with tie rods as specified, may be used as upper hanger attachments for the support of piping, subject to clamp manufacturer's recommended limits.
- C. Attachment to Existing Cast-In-Place Concrete:
 - 1. For piping up to a maximum of 4 inches in size, secure hangers to overhead construction with self-drilling type expansion shields and machine bolts.
 - 2. Secure hangers to wall or floor construction with single unit expansion shields or self-drilling type expansion shields and machine bolts.

3.04 ANCHORS, RESTRAINTS, RIGID SUPPORTS, STAYS AND SWAY BRACES

- A. Install pipe anchors, restraints and sway braces, at locations noted on the Drawings. Design anchors so as to permit piping to expand and contract freely in opposite directions, away from anchor points. Install anchors independent of all hangers and supports, and in a manner that will not affect the structural integrity of the building.
- B. Cast Iron Soil Piping Systems:
 - 1. Where piping is suspended on centers in excess of 18 inches by means of non-rigid hangers, provide sway braces, of design, number and location in accordance with the Cast Iron Soil Pipe Institute's Cast Iron Soil Pipe and Fittings Handbook to prevent horizontal pipe movement.
 - 2. Additionally, brace piping 5 inches and larger to prevent horizontal movement and/or joint separation. Provide braces, blocks, rodding or other suitable method at each branch opening, or change of direction in accordance with the Cast Iron Soil Pipe Institute's Cast Iron Soil Pipe and Fittings Handbook to prevent horizontal pipe movement.

3.05 PIPING IN TUNNELS

- A. Support piping in tunnels on adjustable stanchions, fabricated in accordance with the details on the Drawings, unless otherwise indicated. Install, secure and be responsible for the proper locations of all cast-in-place inserts and stanchion supports, in ample time so as not to delay construction Work. Secure tops of stanchions to overhead construction, as required and approved.

3.06 COMBINATION CLEVIS HANGER, PIPE INSULATION SHIELD AND VAPOR BARRIER JACKETED HIGH DENSITY INSULATING SADDLES

- A. Install a combination clevis hanger, pipe insulation shield and vapor barrier jacketed high density insulating saddles, at all points of support for piping or tubing to be insulated for cold service. Furnish companion high density vapor barrier jacketed saddle pieces, of the same material, thickness and length, for installation over the top 180 degree surface of pipe or tubing, at each point of support where an insulated clevis hanger is utilized.

3.07 PIPE INSULATION SHIELDS

- A. Unless otherwise specified, install a pipe insulation shield, at all points of support. Center shields on all hangers and supports outside of high density insulation insert, and install in such a manner so as not to cut, or puncture jacket.

3.08 PIPE COVERING PROTECTION SADDLES

- A. Install pipe covering protection saddles at all points of support, for steel piping 6 inches in size and larger, insulated with hot service insulation. Weld saddles to piping to insure movement with pipe.

END OF SECTION

SECTION 22 05 53

PIPE AND VALVE IDENTIFICATION

PART 1 GENERAL

1.01 REFERENCES

- A. ANSI A13.1 - Scheme for Identification of Piping Systems.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions for each item specified.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. W.H. Brady Co., Milwaukee, WI.
- B. Emed Co., Buffalo, NY.
- C. Panduit Corp., Tinley Park, IL.
- D. Seton Nameplate Corp., New Haven, CT.

2.02 PIPE MARKERS AND ACCESSORIES

- A. Snap-on Marker: One piece wrap around type constructed of precoiled acrylic plastic with clear polyester coating, integral flow arrows, legend printed in alternating directions, 3/4 inch adhesive strip on inside edge, and 360 degree visibility.
- B. Strap-On Marker: Strip type constructed of precoiled acrylic plastic with clear polyester coating, integral flow arrows, legend printed in alternating directions, factory applied grommets, and pair of stainless steel spring fasteners.
- C. Stick-On Marker: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating, and integral flow arrows for applications where flow arrow banding tape is not being used.
- D. Pipe Marker Legend and Color Field Sizes:

OUTSIDE DIAMETER OF PIPE OR INSULATION (Inches)	LETTER SIZE (Inches)	LENGTH OF COLOR FIELD (Inches)
3/4 to 1-1/4	1/2	8
1-1/2 to 2	3/4	8
2-1/2 to 6	1-1/4	12

- E. Banding Tapes: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating.
1. Plain Tape: Unprinted type; color to match pipe marker background.
 2. Flow Arrow Tape: Printed type with integral flow arrows; color to match pipe marker background.
- F. Pipe Size Labels: Pressure sensitive adhesive backed type constructed of vinyl with clear polyester coating, vertical reading pipe size in inches, and legend size matching adjacent pipe marker.

2.03 PIPE SERVICE IDENTIFICATION TAGS

- A. Type: No. 19 B & S gage brass, with 1/4 inch high pipe service abbreviated legend on one line, over 1/2 inch high pipe size legend in inches, both deep stamped and black filled; and 3/16 inch top hole for fastener.
- B. Size: 2 inch square tag.
- C. Fasteners: Brass "S" hook or brass jack chain of size as required for pipe to which tag is attached.

2.04 VALVE SERVICE IDENTIFICATION TAGS

- A. Type: No. 19 B & S gage brass, with 1/4 inch high valve service abbreviated lettering on one line over 1/2 inch high valve service chart number, both deep stamped and black filled; and with 3/16 inch top hole for fastener.
- B. Sizes:
1. Plumbing Use: 1-1/2 inch hexagon.
- C. Fasteners: Brass "S" hook or brass jack chain of size as required for valve stem or handle to which tag is attached.

2.05 VALVE SERVICE IDENTIFICATION CHART FRAMES

- A. Type: Satin finished extruded aluminum frame with rigid clear plastic glazing, size to fit 8-1/2 x 11 inches valve chart.

PART 3 EXECUTION

3.01 PREPARATION

- A. Complete testing, insulation and finish painting work prior to completing the Work of this Section.
- B. Clean pipe surfaces with cleaning solvents prior to installing piping identification.
- C. Remove dust from insulation surfaces with clean cloths prior to installing piping identification.

3.02 INSTALLATION

- A. Install the Work of this Section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.
- B. Stick-On Pipe Markers:
 - 1. Install minimum of 2 markers at each specified location, 90 degrees apart on visible side of pipe.
 - 2. Encircle ends of pipe markers around pipe or insulation with banding tape with one inch lap. Use plain banding tape on markers with integral flow arrows, and flow arrow banding tape on markers without integral flow arrows.
- C. Pipe Size Labels: Install labels adjacent to each pipe marker and upstream from flow arrow. Install a minimum of 2 pipe size labels at each specified location, 90 degrees apart on visible side of pipe.
- D. Pipe Service Identification Tags: Attach tags to piping being identified with "S" hooks or jack chains.

3.03 PIPING IDENTIFICATION SCHEDULE

- A. Piping Identification Types:
 - 1. Piping or Insulation under 3/4 inch od: Pipe identification tags.
 - 2. Piping or Insulation 3/4 inch to 5-7/8 inch od: Snap-on marker or stick-on marker.
 - 3. Piping or Insulation 6 inch od and Larger: Strap-on marker or stick-on marker.
- B. Identify exposed piping, bare or insulated, as to content, size of pipe and direction of flow, with the following exceptions:
 - 1. Piping in non-walk-in tunnels or underground conduits between manholes.
 - 2. Piping in furred spaces or suspended ceilings, except at valve access panels where valves and piping shall be identified as specified for exposed piping systems.
 - 3. Piping in finished spaces such as offices, class rooms, wards, toilet rooms, shower rooms and spaces as specified.

- C. Locate piping identification to be visible from exposed points of observation.
 - 1. Locate piping identification at valve locations; at points where piping enters and leaves a partition, wall, floor or ceiling, and at intervals of 20 feet on straight runs.
 - 2. Where 2 or more pipes run in parallel, place printed legend and other markers in same relative location.

3.04 VALVE IDENTIFICATION SCHEDULE

- A. Valve Service Identification Tags:
 - 1. Tag control valves, except valves at equipment, with a brass tag fastened to the valve handle or stem, marked to indicate service and numbered in sequence for the following applications:
 - a. Domestic water valves controlling mains, risers and branch runouts.
 - b. Gas valves controlling mains, risers, and branch runouts.
 - c. Valves in sprinkler and fire standpipe systems, except hose valves.
- B. Valve Service Identification Charts:
 - 1. Provide 2 framed valve charts for each piping system specified to be provided with valve identification tags. Type charts on 8-1/2 x 11 inches heavy white bond paper, indicating valve number, service and location.
 - 2. Hang framed charts at locations as directed.

END OF SECTION

SECTION 22 05 76

DRAINAGE ACCESSORIES

PART 1 GENERAL

1.01 REFERENCES

- A. Comply with the applicable requirements of ASME A112.36.2M - Cleanouts, and ASME A112.1.2 - Drainage Funnels and Air Gaps.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, and installation instructions for each item specified except fasteners.

1.03 MAINTENANCE

- A. Special Tools: Deliver the following to the Director's Representative:
 - 1. Tools for Vandal Resistant Fasteners: One for each type and size.
 - 2. T-Handle Wrench for Cleanout Plugs: One for each type and size.

PART 2 PRODUCTS

2.01 CLEANOUT PLUG

- A. Cast brass or bronze, with threaded end, and raised or countersunk head.
 - 1. Tapped head for attachment of cleanout wall or deck plate covers where required.
- B. Anti-Seize Lubricant: Never-Seez by Bostik Chemical Group, Broadview, IL; Molycote 1000 by Dow Corning Corp, Midland, MI; Anti-Seize Lubricant by Loctite Corp, Newington, CT.

2.02 CLEANOUT

- A. Threaded pipe fitting or cast iron ferrule with gas tight cleanout plug.

2.03 CLEANOUT WALL PLATE

- A. Round, stainless steel or polished chrome plated bronze cover plate with stainless steel vandal resistant fastener to secure to cleanout plug.

2.04 CLEANOUT DECK PLATE

- A. Standard duty floor cleanout fitting with coated cast iron body; round, polished nickel bronze scoriated top secured to cleanout plug with

stainless steel vandal resistant fastener; threaded height adjustment, cast iron head, gas tight cleanout plug, and connection to match piping option selected.

- B. Membrane flange and clamping collar, secured with corrosion resistant fasteners.

2.05 CONDUCTOR EXPANSION JOINT

- A. Coated cast iron body with brass telescoping sleeve, adjustable packing gland with graphite, neoprene or mineral fiber gasket, and connection to match piping option selected.

2.06 AIR GAP FITTING

- A. Coated cast iron body with air gaps, set screw or threaded inlet, and outlet connection to match piping option selected.

2.07 INDIRECT WASTE FUNNEL

- A. Combination Funnel Drain and P Trap: Polished chrome plated cast brass construction.
 - 1. Funnel: 4 inch top dia., 4 inches deep, with threaded outlet.
 - 2. P Trap: Bottom cleanout, threaded inlet, and outlet connection to match piping option selected.

2.08 FASTENERS

- A. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 stainless steel bolts.
- B. Vandal Resistant Fasteners: Torx head with center pin.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.
- B. Cleanout Plug: Lubricate threads with anti-seize lubricant before final installation.
- C. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

SECTION 22 05 77
FLOOR AND AREA DRAINS

PART 1 GENERAL

1.01 REFERENCES

- A. Unless otherwise specified, the Work of this section shall meet the applicable requirements of FS WW-P-541 - Plumbing Fixtures, and ASME A112.21.1M - Floor Drains.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions for each type drain specified.

1.03 MAINTENANCE

- A. Special Tools: Deliver to the Director's Representative.
 - 1. Tools for Vandal Resistant Fasteners: One for each type and size.

PART 2 PRODUCTS

2.01 TYPE A FLOOR DRAIN

- A. Drain Body: Coated cast iron, two-piece body with reversible flashing clamp, minimum 9 inch dia drainage flange, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected.
- B. Strainer Head: Round, minimum 7 inch dia, nickel bronze with threaded shank for height adjustment.
- C. Strainer Grate: Polished nickel bronze, heel proof; secured with stainless steel vandal resistant fasteners.
- D. Acceptable Drain Series: Josam 30000A, Smith 2010A, Wade W1100, and Zurn Z415.

2.02 TYPE B FLOOR DRAIN

- A. Drain Body: Coated cast iron, two-piece body with reversible flashing clamp, minimum 9 inch dia drainage flange, corrosion resistant bolts, weep holes, bottom outlet, and connection to match piping option selected.

- B. Strainer Head: Round, minimum 8 inch dia, nickel bronze with threaded shank for height adjustment.
- C. Strainer Grate: Polished nickel bronze, heel proof, fitted with a 4 inch high, 6 inch dia nickel bronze funnel, and secured with stainless steel vandal resistant fasteners.
 - 1. Funnel either cast integral with, threaded or bolted into top of strainer grate.
- D. Acceptable Drain Series: Josam 30000E2, Smith 2010A, Wade W1100, and Zurn Z415.

2.03 FASTENERS

- A. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 or stainless steel bolts.
- B. Vandal Resistant Fasteners: Torx head with center pin.

2.04 FREE AREA OF GRATE

- A. Minimum strainer grate free area listed below for each connecting pipe size:

CONNECTING PIPE SIZE (Inches Nominal)	INTERIOR DRAINS FREE AREA (Square Inches)	EXTERIOR DRAINS FREE AREA (Square Inches)
1-1/2	3.06	4.08
2	4.71	6.28
3	10.59	14.12
4	18.90	25.20
5	29.40	39.20
6	42.45	56.60
8	75.38	100.50

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.
- B. Protect weep holes from plugging during installation. Rod out weep holes after installation to remove obstructions.
- C. Adjust strainer head to height indicated. If height not indicated, set at 1/2 inch below finished floor elevation.

- D. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 07 00

PIPING INSULATION

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Through Penetration Firestops: Section 078400.
- B. Painting: Section 099103.
- C. Pipe Hangers and Supports: Section 220529.

1.02 ABBREVIATIONS

- A. FS: Federal Specification.
- B. K: Thermal Conductivity, i.e., maximum Btu per inch thickness per hour per square foot.
- C. PCF: Pounds per cubic foot.
- D. PVC: Polyvinylchloride.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's catalog sheets, specifications and installation instructions for the following:
 - 1. Insulation Materials.
 - 2. Jacket Materials.
- B. Quality Control Submittals:
 - 1. Installers Qualification Data:
 - a. Name of each person who will be performing the Work, and their employer's name, business address and telephone number.
 - b. Furnish names and addresses of the required number of similar projects that each person has worked on which meet the qualifications.

1.04 QUALITY ASSURANCE

- A. Qualifications: The persons installing the Work of this Section and their Supervisor shall be personally experienced in mechanical insulation work and shall have been regularly employed by a company installing mechanical insulation for a minimum of 5 years.
- B. Regulatory Requirements:

1. Insulation installed inside buildings, including laminated jackets, mastics, sealants and adhesives shall have a Fire Spread/Smoke Developed Rating of 25/50 or less based on ASTM E 84.

PART 2 PRODUCTS

2.01 PIPING INSULATION

- A. Fibrous Glass (Mineral Fiber) Insulation: Composed principally of fibers manufactured from rock, slag, or glass, with or without binders, and asbestos free.
 1. Preformed Pipe Insulation: Minimum density 3 pcf; ASTM C 547:
 - a. Class 1 (Suitable for Temperatures Up to 450 degrees F): K of 0.26 at 75 degrees F.
 2. Premolded Fitting Insulation: Minimum density 4.0 pcf, K of 0.26 at 75 degrees F; ASTM C 547, Class 1.
 3. Insulation Inserts for PVC Fitting Jackets: Minimum density 1.5 pcf, K of 0.28 at 75 degrees F; ASTM C 553, Type III.
 - a. Suitable for temperatures up to 450 degrees F.
- B. Flexible Elastomeric Foam Insulation:
 1. FM tested and approved, meeting the following:
 - a. Maximum Water Vapor Transmission: 0.10 perm - inch based on ASTM E 96, Procedure A.
 - b. K of 0.27 at 75 degrees F based on ASTM C 518 or C 177.
 - c. Fire Spread/Smoke Developed Rating: 25/50 or less based on ASTM E 84.
 2. Pipe Insulation: ASTM C 534, Type I.
 3. Polyethylene and polyolefin insulation is not acceptable.
- C. High Density Jacketed Insulation Inserts for Hangers and Supports:
 1. For Use with Fibrous Glass Insulation:
 - a. Cold Service Piping:
 - 1) Polyurethane Foam: Minimum density 4 pcf, K of 0.13 at 75 degrees F, minimum compressive strength of 125 psi.
 - b. Hot Service Piping:
 - 1) Calcium Silicate: Minimum density 15 pcf, K of 0.50 at 300 degrees F; ASTM C 533.
 - 2) Perlite: Minimum density 12 pcf, K of 0.60 at 300 degrees F; ASTM C 610.
 2. For Use with Flexible Elastomeric Foam Insulation: Hardwood dowels and blocks, length or thickness equal to insulation thickness, other dimensions as specified or required.
- D. Cements:
 1. Fibrous Glass Thermal Insulating Cement: Asbestos free; ASTM C 195.
 2. Fibrous Glass Hydraulic Setting Thermal Insulating and Finishing Cement: ASTM C 449/C 449M.

2.02 INSULATION JACKETS

- A. Laminated Vapor Barrier Jackets for Piping: Factory applied by insulation manufacturer, conforming to ASTM C 1136, Type I.
 - 1. Type I: Reinforced white kraft and aluminum foil laminate with kraft facing out.
 - a. Pipe Jackets: Furnished with integral 1-1/2 inch self sealing longitudinal lap, and separate 3 inch wide adhesive backed butt strips.
 - 2. Laminated vapor barrier jackets are not required for flexible elastomeric foam insulation.
- B. Canvas Jackets: Cotton duck, fire retardant, complying with NFPA 701, 4 oz or 6 oz per sq yd as specified.
- C. Premolded PVC Fitting Jackets:
 - 1. Constructed of high impact, UV resistant PVC.
 - a. ASTM D 1784, Class 14253-C.
 - b. Working Temperature: 0-150 degrees F.
- D. Metal Jacketing:
 - 1. Aluminum: ASTM B 209, Alloys 1100, 30003, 3105 or 5005, Temper H14, 0.016 inch thick.
 - a. Factory Pre-formed Sectional Pipe Jacketing:
 - 1) Smooth outer finish with integral bonded laminated polyethylene film - kraft paper moisture barrier underside.
 - 2) Pittsburgh or modified Pittsburgh longitudinal lock seams.
 - 3) 2 inch overlapping circumferential joints with integral locking clips, or butt joints sealed with 2 inch wide mastic backed aluminum snap bands.
 - b. Fastening Devices:
 - 1) Strapping: Type 18-8 stainless steel, 0.020 inch thick, 1/2 and 3/4 inch wide as specified.
 - 2) Wing Seals: Type 18-8 stainless steel, 0.032 inch thick.
 - 3) Sheet Metal Screws: Panhead, Type A, hardened aluminum, and stainless steel.

2.03 ADHESIVES, MASTICS, AND SEALERS

- A. Lagging Adhesive (Canvas Jackets): Childers' CP-50AMV1, Epolux's Cadalag 336, Foster's 30-36.
- B. Vapor Lap Seal Adhesive (Fibrous Glass Insulation): Childers' CP-82, Epolux's Cadoprene 400, Foster's 85-60 or 85-20.

- C. Vapor Barrier Mastic(Fibrous Glass Insulation): Permeance shall be .03 perms or less at 45 mils dry per ASTM E 96. Childers' CP-34, Epolux's Cadalar 670, Foster's 30-65.
- D. Adhesive (Flexible Elastomeric Foam): Armstrong's 520, Childers' CP-82, Epolux's Cadoprene 488, Foster's 85-75. 5 gallon cans only
- E. Adhesive (Fiberglass Duct Liner): Childers' Chil Quick CP-127, Foster Vapor Fas 85-60. Must comply with ASTM C 916, Type II
- F. Weather Barrier Breather Mastic (Reinforcing Membrane): Childers' VI-CRYL CP-10/11, Foster's Weatherite 46-50.
- G. Sealant (Metal Pipe Jacket): Non hardening elastomeric sealants. Foster Elastolar 95-44, Childers Chil Byl CP-76, Pittsburgh Corning 727
- H. Reinforcing Membrane: Childers' Chil Glas #10, Foster Mast a Fab, Pittsburgh Corning PC 79

2.04 MISCELLANEOUS MATERIALS

- A. Pressure Sensitive Tape for Sealing Laminated Jackets:
 - 1. Acceptable Manufacturers: Alpha Associates, Ideal Tape, Morgan Adhesive.
 - 2. Type: Same construction as jacket.
- B. Wire, Bands, and Wire Mesh:
 - 1. Binding and Lacing Wire: Nickel copper alloy or copper clad steel, gage as specified.
 - 2. Bands: Galvanized steel, 1/2 inch wide x 0.015 inch thick, with 0.032 inch thick galvanized wing seals.
 - 3. Wire Mesh: Woven 20 gage steel wire with 1 inch hexagonal openings, galvanized after weaving.
- C. Reinforcing Membrane: Glass or Polyester, 10 x 10 mesh. Alpha Associates Style 59, Childer's Chil-Glas, Foster's MAST-A-FAB.

PART 3 EXECUTION

3.01 PREPARATION

- A. Perform the following before starting insulation Work:
 - 1. Install hangers, supports and appurtenances in their permanent locations.
 - 2. Complete testing of piping.
 - 3. Clean and dry surfaces to be insulated.

3.02 INSTALLATION, GENERAL

- A. Install the Work of this Section in accordance with the manufacturer's printed installation instructions unless otherwise specified.
- B. Provide continuous piping insulation and jacketing when passing thru interior wall, floor, and ceiling construction.
 - 1. At Through Penetration Firestops: Coordinate insulation densities with the requirements of approved firestop system being installed. See Section 078400.
 - a. Insulation densities required by approved firestop system may vary with the densities specified in this Section. When this occurs use the higher density insulation.
- C. Do not intermix different insulation materials on individual runs of piping.

3.03 INSTALLATION AT HANGERS AND SUPPORTS

- A. Reset and realign hangers and supports if they are displaced while installing insulation.
- B. Install high density jacketed insulation inserts at hangers and supports for insulated piping.
- C. Insulation Inserts For Use with Fibrous Glass Insulation:
 - 1. Where clevis hangers are used, install insulation shields and high density jacketed insulation inserts between shield and pipe.
 - a. Where insulation is subject to compression at points over 180 degrees apart, e.g. riser clamps, U-bolts, trapezes, etc.; fully encircle pipe with 2 protection shields and 2 high density jacketed fibrous glass insulation inserts within supporting members.
 - 1) Exception: Locations where pipe covering protection saddles are specified for hot service piping, 6 inch and larger.
- D. Insulation Inserts For Use with Flexible Elastomeric Foam Insulation:
 - 1. Where clevis hangers are used, install insulation shields with hardwood filler pieces, same thickness as adjoining insulation, inserted in undersized die cut or slotted holes in insulation at support points.
 - 2. Contour hardwood blocks to match the curvature of pipe, and shield.
 - 3. Coat dowels and blocks with insulation adhesive, and insert while still wet.
 - 4. Vapor seal outer surfaces of dowels and blocks with adhesive after insertion.
 - 5. Install filler pieces as follows:

PIPE/TUBING SIZE	FILLER PIECES	POSITION
Thru 1-1/2"	2 dowel plugs	6 o'clock; in tandem
2" thru 4"	1 block, 2 dowel plugs	6 o'clock, and

		4 & 8 o'clock respectively
--	--	----------------------------

3.04 INSTALLATION OF FIBROUS GLASS COLD SERVICE INSULATION

- A. Install insulation materials with a field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket, unless otherwise specified.
- B. Piping:
 - 1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self-sealing longitudinal jacket laps and 3-inch wide butt adhesive backed strips.
 - a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as jacket, may be used in lieu of butt strips.
 - 2. Bed insulation in a 2-inch wide band of vapor barrier mastic, and vapor seal exposed ends of insulation with vapor barrier mastic at each butt joint between pipe insulation and equipment, fittings or flanges at the following intervals:
 - a. Horizontal Pipe Runs: 21 ft.
 - b. Vertical Pipe Runs: 9 ft.
- C. Fittings, Valves, Flanges and Irregular Surfaces:
 - 1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as pipe insulation.
 - 2. Secure insulation in place with 16-gage wire, with ends twisted and turned down into insulation.
 - 3. Butt insulation against pipe insulation and bond with joint sealer.
 - 4. Insulate valves up to and including bonnets, without interfering with packing nuts.
 - 5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
 - 6. When insulating cement has dried, seal fitting, valve and flange insulation, by imbedding a layer of reinforcing membrane or 4 oz. canvas jacket between 2 flood coats of vapor barrier mastic, each 1/8 inch thick wet.
 - 7. Lap reinforcing membrane or canvas on itself and adjoining pipe insulation at least 2 inches.
 - 8. Trowel, brush or rubber glove outside coat over entire insulated surface.
 - 9. Exceptions:
 - a. Type C and D Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
 - 1) Additional insulation inserts are required for services with operating temperatures under 45 degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not go below 45 degrees F.

3.05 INSTALLATION OF FIBROUS GLASS HOT SERVICE INSULATION

- A. Install insulation materials with field or factory applied ASTM C 1136 Type I laminated vapor barrier jacket unless otherwise specified.
- B. Canvas Jackets on Piping, Fittings, Valves, Flanges, Unions, and Irregular Surfaces:
 - 1. For Piping 2 inch Size and Smaller: 4 oz per sq yd unless otherwise specified.
 - 2. For Piping Over 2 inch Size: 6 oz per sq yd unless otherwise specified.
- C. Piping:
 - 1. Butt insulation joints together, continuously seal minimum 1-1/2 inch wide self-sealing longitudinal jacket laps and 3-inch wide adhesive backed butt strips.
 - a. Substitution: 3 inch wide pressure sensitive sealing tape, of same material as the jacket, may be used in lieu of butt strips.
 - 2. Fill voids in insulation at hanger with insulating cement.
 - 3. Exceptions:
 - a. Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Spaces and Concealed Piping: Butt insulation joints together and secure minimum 1-1/2 inch wide longitudinal jacket laps and 3 inch wide butt strips of same material as jacket, with outward clinching staples on maximum 4 inch centers. Fill voids in insulation at hangers with insulating cement.
- D. Fittings, Valves, Flanges and Irregular Surfaces:
 - 1. Insulate with mitre cut or premolded fitting insulation of same material and thickness as insulation.
 - 2. Secure in place with 16-gage wire, with ends twisted and turned down into insulation.
 - 3. Butt fitting, valve and flange insulation against pipe insulation, and fill voids with insulating cement.
 - 4. Insulate valves up to and including bonnets, without interfering with packing nuts.
 - 5. Apply leveling coat of insulating cement to smooth out insulation and cover wiring.
 - 6. After insulating cement has dried, coat insulated surface with lagging adhesive, and apply 4 oz or 6 oz canvas jacket as required by pipe size.
 - a. Lap canvas jacket on itself and adjoining pipe insulation at least 2 inches.
 - b. Size entire canvas jacket with lagging adhesive.
 - 7. Exceptions:
 - a. In Types E, and F Service Piping Systems: Valves, fittings and flanges may be insulated with premolded PVC fitting jackets, with fibrous glass insulation inserts.
 - 1) Additional insulation inserts are required for services with operating temperatures over 250

degrees F or where insulation thickness exceeds 1-1/2 inches. The surface temperature of PVC fitting jacket must not exceed 150 degrees F.

- b. In Types E, and F Service Piping Systems: Insulate fittings, valves, and irregular surfaces 3 inch size and smaller with insulating cement covered with 4 oz or 6 oz canvas jacket as required by pipe size.
 - 1) Terminate pipe insulation adjacent to flanges and unions with insulating cement, trowelled down to pipe on a bevel.
- c. Fittings, Valves, Flanges, and Irregular Surfaces In Concealed Piping, Piping in Accessible Shafts, Attic Spaces, Crawl Spaces, Unfinished Rooms, Unfinished Spaces, and Tunnels: Sizing of canvas surface is not required.

3.06 INSTALLATION OF FLEXIBLE ELASTOMERIC FOAM INSULATION

- A. Where possible, slip insulation over the pipe, and seal butt joints with adhesive.
 - 1. Where the slip-on technique is not possible, slit the insulation and install.
 - 2. Re-seal with adhesive, making sure the mating surfaces are completely joined.
- B. Insulate fittings and valves with miter cut sections. Use templates provided by the manufacturer, and assemble the cut sections in accordance with the manufacturer's printed instructions.
 - 1. Insulate threaded fittings and valves with sleeved fitting covers. Over lap and seal the covers to the adjoining pipe insulation with adhesive.
- C. Carefully mate and seal with adhesive all contact surfaces to maintain the integrity of the vapor barrier of the system.
- D. Piping Exposed Exterior to a Building, Totally Exposed to the Elements:
 - 1. Apply flexible elastomeric foam insulation to piping with adhesive.
 - 2. Apply reinforcing membrane around piping insulation with adhesive or mastic.
 - 3. Adhesive Applied System: Apply 2 coats of finish. See Section 099103.
 - 4. Mastic Applied System: Apply another coat of mastic over reinforcing membrane.

3.07 INSTALLATION OF SHEET METAL JACKETING ON PIPING

- A. Secure jacketing to insulated piping with preformed aluminum snap straps and stainless steel strapping installed with special banding wrench.
- B. Jacket exposed insulated fittings, valves and flanges with mitred sections of aluminum jacketing.

1. Seal joints with sealant and secure with preformed aluminum bands.
3. Substitution: Factory fabricated, preformed, sectional aluminum fitting covers or premolded polyvinylchloride fitting covers may be used in lieu of mitred sections of aluminum jacketing for covering fittings, valves and flanges.

3.08 FIELD QUALITY CONTROL

- A. Field Samples: The Director's Representative, may at his discretion, take field samples of installed insulation for the purpose of checking materials and application. Reinsulate sample cut areas.

3.09 PIPING INSULATION SCHEDULE

- A. Insulate all cold service and hot service piping, and appurtenances except where otherwise specified.
- B. Schedule of Items Not to be Insulated:
 1. Chrome plated piping, unless otherwise specified.
 2. Exposed piping in finished spaces, serving one fixture, or piece of equipment, and which connection from the main, branch, or riser, is 24 inches or less in length.
 3. Water heater blow-off piping.
 4. Air vents, pressure reducing valves, pilot lines, safety valves, relief valves.
 5. Water meters.
 6. Piping buried in the ground, unless otherwise specified herein.
 7. Items installed by others, unless otherwise specified herein.
 8. Sanitary drainage piping, unless otherwise specified herein.
 9. Mechanical equipment with factory applied steel jacket.
 10. Hot service piping 81 degrees F to 104 degrees F.
 11. Flanges and unions in Type E, F, and G service piping systems.
 12. Sprinkler and standpipe piping, unless otherwise specified.

3.10 COLD SERVICE INSULATION MATERIAL SCHEDULE

TYPE	SERVICE AND TEMPERATURES	INSULATION MATERIAL	PIPE SIZES (INCHES)	MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)
C	Fluids (except domestic cold water) 40 F to 80 F.	Flex. Elastomeric Foam or Fibrous Glass	1-1/2 & less	1
			Over 1-1/2	1-1/2
D	Domestic cold water, and as specified. 33 F to 80 F.	Flex. Elastomeric Foam or Fibrous Glass	All Sizes	1/2

A. NOTES:

1. Sprinkler and Standpipe Piping (First 10 feet connected to domestic water main within building): Insulate with same materials and thicknesses specified for domestic cold water.
3. Piping Serving Handicapped Accessible Lavatories:
 - a. Insulate exposed hot water supply and waste piping with flexible elastomeric foam pipe insulation.
 - b. Insulate exposed hot and cold water supply, and waste piping with under lav piping protection cover. Install fasteners thru each pair of holes in insulated safety wrap.

3.11 HOT SERVICE INSULATION MATERIAL SCHEDULE

	SERVICE AND TEMPERATURES	INSULATION MATERIAL	PIPE SIZES (INCHES)	MINIMUM (NOMINAL) INSULATION THICKNESS (INCHES)
E	Water and other fluids 105 F to 140 F.	Flex. Elastomeric Foam or Fibrous Glass	1-1/2 & Less	1
			Over 1-1/2	2

3.12 SCHEDULE OF METAL JACKETING FOR INSULATED PIPE

C. General:

1. Jacket exposed insulated piping with preformed sectional aluminum metal pipe jacketing.

END OF SECTION

SECTION 22 08 00
CLEANING AND TESTING

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Testing Sprinkler System: NFPA-13.

1.02 SUBMITTALS

- A. Quality Control Submittals
 - 1. Test Reports (Field Tests): Submit data for each system tested, and/or disinfected; include date performed, description, and test results for each system.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Perform factory testing of factory fabricated equipment in complete accordance with the agencies having jurisdiction.
 - 2. Perform field testing of piping systems in complete accordance with the local utilities and other agencies having jurisdiction and as specified.

1.04 PROJECT CONDITIONS

- A. Protection: During test Work, protect controls, gages and accessories which are not designed to withstand test pressures. Do not utilize permanently installed gages for field testing of systems.

1.05 SEQUENCING AND SCHEDULING

- A. Transmit written notification of proposed date and time of operational tests to the Director's Representative at least 5 days in advance of such tests.
- B. Perform cleaning and testing Work in the presence of the Director's Representative.
- C. Pressure test piping systems inside buildings, at the roughing-in stage of installation, before piping is enclosed by construction Work, and at other times as directed. Perform test operations in sections as required and directed, to progress the Work in a satisfactory manner and not delay the general construction of the building. Valve or cap-off sections of piping to be tested, utilizing valves required to be installed in the permanent piping systems, or temporary valves or caps as required to perform the Work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Test Equipment and Instruments: Type and kind as required for the particular system under test.
- B. Test Media (air, vacuum, water): As specified for the particular piping or system under test.
- C. Cleaning Agent (water): As specified for the particular piping, apparatus or system being cleaned.

PART 3 EXECUTION

3.01 PRELIMINARY WORK

- A. Thoroughly clean pipe and tubing prior to installation. During installation, prevent foreign matter from entering systems. Prevent if possible and remove stoppages or obstructions from piping and systems.

3.02 PRESSURE TESTS - PIPING

- A. Piping shall be tight under test and shall not show loss in pressure or visible leaks, during test operations or after the minimum duration of time as specified. Remove piping which is not tight under test; remake joints and repeat test until no leaks occur.
- B. Water Systems:
 - 1. Domestic water (potable cold, domestic hot and recirculation) inside buildings:
 - a. Before fixtures, faucets, trim and accessories are connected, perform hydrostatic test at 125 psig minimum for 4 hours.
 - b. After fixtures, faucets, trim and accessories are connected, perform hydrostatic retest at 75 psig for 4 hours.
- C. Gas Piping: Before backfilling or concealment perform air test of duration and pressure as required by the local gas company. However, for gas piping designed for pressures of from 4 inches to 6 inches water column, air test at 15 inches Hg for one hour, without drop in pressure. Test gas piping with air only. Check joints for leaks with soap suds.
- D. Air Piping:
 - 1. Compressed Air: Test with air at 150 psig for one hour.
 - 2. Check joints for leaks with soap suds.

- E. Drainage, Vent, Conductor and Roof Drain Piping (Inside Buildings): Perform tests before fixtures are installed. Test by filling the entire system with water, and allowing to stand for 3 hours, with no noticeable loss of water. Test joints under a minimum head of 10 feet of water, except the uppermost section. Test the uppermost section to overflowing.

3.03 TESTING OF EQUIPMENT, APPARATUS AND APPURTENANCES

- A. Relief Valves: Increase pressure in equipment or apparatus to relief valve setting, to test opening of valves at required relief pressures.

3.04 DISINFECTION OF POTABLE WATER SYSTEMS

- A. Disinfect potable water pipe and equipment installed in the Work of this Contract.
 - 1. Completely fill the piping, including water storage equipment if installed, with a water solution containing 50 mg/L available chlorine, and allow stand for 24 hours. Operate all valves during this period to assure their proper disinfection.
 - 2. After the retention period, discharge the solution to an approved waste and flush the system thoroughly with water until substantially all traces of chlorine are removed. Drain and flush water storage equipment if installed.
- B. Connect plumbing fixtures and equipment and place the system into service. Prevent recontamination of the piping during this phase of the Work.

END OF SECTION

SECTION 221100

DOMESTIC WATER PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping, within 5 feet of building.
 - 2. Domestic water piping, above grade.
 - 3. Unions and flanges.
 - 4. Valves.
 - 5. Flow control valves.
 - 6. Water pressure reducing valves.
 - 7. Relief valves.
 - 8. Strainers.
 - 9. Hose bibs.
 - 10. Hydrants.
 - 11. Recessed valve box.
 - 12. Backflow preventers.
 - 13. Water hammer arrestors.
 - 14. Thermostatic mixing valves.
 - 15. Pressure balanced mixing valves.
 - 16. In-line circulator pumps.

1.2 REFERENCES

- A. American National Standards Institute ANSI.
- B. American Society of Mechanical Engineers (ASME).
- C. American Society of Sanitary Engineering (ASSE).
- D. ASTM International:
- E. American Welding Society (AWS).
- F. American Water Works Association: (WWA).
- G. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS).
- H. National Electrical Manufacturers Association (NEMA).
- I. Plumbing and Drainage Institute (PDI).

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 - 1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturer's catalog information.
 - 2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
 - 3. Hangers and Supports: Submit manufacturers catalog information including load capacity.
 - 4. Domestic Water Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.
 - 5. Pumps: Submit pump type, capacity, certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.
- C. Manufacturer's Installation Instructions: Submit installation instructions for pumps, valves and accessories.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01700 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of valves and equipment.
- C. Operation and Maintenance Data: Submit spare parts list, exploded assembly views and recommended maintenance intervals.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with NYS and Local standards.
- B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETINGS

- A. Section 01300 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Accept valves and equipment on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Product Requirements.
- B. Do not install underground piping when bedding is wet or frozen.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.11 WARRANTY

- A. Section 01700 - Execution Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for domestic water piping.

1.12 EXTRA MATERIALS

- A. Section 01700 - Execution Requirements: Spare parts and maintenance products.
- B. Furnish two packing kits for each size valve and two pump seals for each pump model.

PART 2 PRODUCTS

2.1 DOMESTIC WATER PIPING, BURIED WITHIN **5 FEET** OF BUILDING

- A. Ductile Iron Pipe: AWWA C151.
 - 1. Fittings: AWWA C110, ductile iron, standard thickness.
 - 2. Joints: AWWA C111, rubber gasket with rods.
 - 3. Jackets: AWWA C105 polyethylene jacket.
- B. Copper Tubing: ASTM B88, Type K, annealed.
 - 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 - 2. Joints: Compression connection or Brazed, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.
- C. PVC Pipe: ASTM D1785, Schedule 80 ASTM D2241, , polyvinyl chloride (PVC) material.
 - 1. Fittings: ASTM D2467, Schedule 80, PVC.
 - 2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
- D. Polyethylene/Aluminum Composition Tubing: ASTM F1281 or ASTM F1282.
 - 1. Fittings and Joints: Brass compression type.
- E. High Density Polyethylene (HDPE) Piping
 - a. Smooth interior annular exterior corrugated polyethylene pipe as per ASTM D3350 minimum cell classification 335420C; AASHTO M294, Type S or AASHTO MP7-97, Type S. The closed cell structural core shall have a compressive strength no less than 20 lbs/square inch, which provides high stress resistance to cracks.
 - b. The bell-and-spigot HDPE piping network shall be joined using watertight connections in accordance with the requirements of ASTM D3212. Elastomeric seals (gaskets) made of polyisoprene and meeting the requirements of ASTM F477 shall show no visible leaks when tested under a 10 ft hydrostatic water test.
 - c. To preclude crumbling and provide better joint performance of the HDPE pipe, the bell and spigot ends shall be reinforced, including a bell tolerance device. The bell tolerance device must be installed by the pipe manufacturer.
 - d. Approved Manufacturers:

Hancor Inc.

2.2 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tubing: ASTM B88 (ASTM B88M), Type L, hard drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F. Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.
- B. Steel Pipe: ASTM A53/A53M Schedule 40, galvanized, grooved ends.
 - 1. Fittings: ASTM A395/A395M and ASTM A536 ductile iron, grooved ends.
 - 2. Joints: Grooved mechanical couplings meeting ASTM F1476.
 - a. Housing Clamps: ASTM A395 and ASTM A536 ductile iron, hot dipped galvanized, compatible with steel piping sizes, rigid type.
 - b. Gasket: Elastomer composition for operating temperature range from -30 degrees F to 230 degrees F.
 - c. Accessories: Steel bolts, nuts, and washers.
- C. CPVC Pipe: ASTM D2846/D2846M, ASTM F441/F441M, or ASTM F442/F442M, chlorinated polyvinyl chloride (CPVC) material.
 - 1. Fittings: ASTM D2846/D2846M, ASTM F437, ASTM F438, ASTM F439, or ASTM F441/F441M, CPVC.
 - 2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement.
- D. PVC Pipe: ASTM D1785 Schedule 40, or ASTM D2241 SDR-26 for not less than 150 psi pressure rating, polyvinyl chloride (PVC) material.
 - 1. Fittings: ASTM D2466, Schedule 40, PVC ASTM D2467, Schedule 80, PVC.
 - 2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

2.3 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
 - 1. Ferrous Piping: Class 150, malleable iron, threaded.
 - 2. Copper Piping: Class 150, bronze unions with soldered.
 - 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 - 4. PVC Piping: PVC.
 - 5. CPVC Piping: CPVC.
- B. Flanges for Pipe 2-1/2 inches and Larger:
 - 1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
 - 2. Copper Piping: Class 150, slip-on bronze flanges.
 - 3. PVC Piping: PVC flanges.
 - 4. CPVC Piping: CPVC flanges.
 - 5. Gaskets: 1/16 inch thick preformed neoprene gaskets.

- C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or ASTM D2464, Schedule 80, threaded, PVC pipe.

2.4 STRAINERS

- A. Strainers in water service piping installed upstream of water meters shall be cast bronze body with stainless steel elements. Strainers shall be rated at 150 p.s.i. working pressure. Strainers shall be of the same manufacturer as the compound water meters.
- B. Strainers in water service piping installed upstream of Double Detector Check Valves shall be flanged basket type, cast iron body with bronze basket and bronze handle and 1/16" perforations, good for the same working pressure as specified for fittings. Strainers shall be Sarco Type 528-B, Mueller Steam Specialty No. 165, or J.R. Smith No. 8795.
- C. Y-Strainers
 - 1. Except as otherwise noted strainers shall be full size Y-pattern provided with removable cylindrical or conical screens of monel or stainless steel and suitable flanges or tapping to connect with the piping they serve.
 - 2. Strainers shall be cast iron on iron and steel piping and bronze on brass or copper piping except as otherwise noted in other sections of the specifications.
 - 3. Screen perforations for water shall be 1/16" (0.57 diameter) for pipe sizes up to 3" and 1/8" for 4" and above.
- D. Provide valves dirt blow-off connection for each Y-strainer. The blow-off connection shall terminate with a gate valve and nipple.
- E. Bronze Y-Strainers shall be Sarco Type BT or Mueller Steam Specialty No. 352.
- F. Cast iron Y-Strainers shall be Sarco Type IT or Mueller Steam Specialty No.11.

2.5 HOSE BIBBS

- A. Manufacturers:
 - 1. Mifab Model MHY-20.
 - 2. Substitutions: Section 01600 - Product Requirements.
- B. Furnish materials in accordance with NYS standards.
- C. Interior: Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed with hand wheel, [integral vacuum breaker in conformance with ASSE 1011.

- D. Interior Mixing: Bronze or brass, wall mounted, double service faucet with hose thread spout, integral stops, chrome plated where exposed with hand wheels, and vacuum breaker in conformance with ASSE 1011.

2.6 HYDRANTS

- A. Wall Hydrant:
 - 1. Wall hydrants shall be nickel bronze with nickel bronze casing, polished nickel bronze face, brass operating parts throughout, adjustable wall clamp, renewable nylon seat, 3/4" HPT standard hose outlet with integral vacuum breaker, 3/4" IPS male thread ground joint union elbow adapter, nickel bronze access box and nickel bronze hinged cover with locking device. Furnish and deliver four (4) operating keys to the Custodian. Wall hydrants shall be Josam 71000, Jay R. Smith 5509-E, Wade W-8625, Zurn Z-1300.
- B. Post Hydrant:
 - 1. Provide post hydrants where indicated on the Drawings. Post Hydrant shall be cast iron non-freeze with aluminum housing, brass casing, brass valve housing, brass removable operating parts and neoprene washers, removable handle with 3/4" hose connection, 3/4" IPS inlet, approved equal to Josam 71700, Smith 5910, Zurn 1385, or Wade W-8610. For number, location, depth, etc., see Drawings.

2.7 BACKFLOW PREVENTERS

- A. Manufacturers:
 - 1. Wilkins Series 575
 - 2. Watts 909
 - 3. Febco 825Y
 - 4. Conbraco 40-200 series
 - 5. Substitutions: Section 01600 - Product Requirements.
- B. Furnish materials in accordance with NYS standards.
- C. Reduced Pressure Backflow Preventers:
 - 1. Comply with ASSE 1013.
 - 2. Bronze body, with bronze internal parts and stainless steel springs.
 - 3. Two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve opening under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.
- D. Double Check Valve Assemblies: Comply with ASSE 1012; Bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.

2.8 WATER HAMMER ARRESTORS

- A. Manufacturers:
 - 1. Josam Series 75000.
 - 2. Zurn Series Z-1700.
 - 3. Smith NYBE Series 5000.
 - 4. Substitutions: Section 01600 - Product Requirements.
- B. Furnish materials in accordance with NYS standards.
- C. ASSE 1010; stainless steel construction, bellows type sized in accordance with PDI WH-201.
- D. Pre-charged suitable for operation in temperature range 34 to 250 degrees F and maximum 150 psi working pressure.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION - SERVICE CONNECTIONS

- A. Provide new water service complete with approved [[reduced pressure] [double check] back-flow preventer and] water meter with by-pass valves [pressure reducing valve,] [and strainer].
- B. Provide sleeve in wall for service main and support at wall with reinforced-concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
- C. Provide 18 gage galvanized sheet metal sleeve around service main to 6 inch above floor and 6 feet minimum below grade. Size for minimum of 2 inches of loose batt insulation stuffing.

3.4 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Test domestic water piping system in accordance with local authority having jurisdiction.

3.5 CLEANING

- A. Section 01700 - Execution Requirements: Requirements for cleaning.
- B. Disinfect water distribution system in accordance with Section 02516.
- C. Prior to starting work, verify system is complete, flushed and clean.
- D. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- E. Inject disinfectant, free chlorine in liquid, powder and tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.
- F. Bleed water from outlets to obtain distribution and test for disinfectant residual at minimum 15 percent of outlets.
- G. Maintain disinfectant in system for 24 hours.
- H. When final disinfectant residual tests less than 25 mg/L, repeat treatment.
- I. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.
- J. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 221119

WATER SUPPLY ACCESSORIES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, dimensional data, and installation instructions for each item specified, excluding fasteners.

1.02 MAINTENANCE

- A. Special Tools: Deliver to the Director's Representative.
 - 1. Wall Hydrant T-Handle Locking Key: One for each wall hydrant.
 - 2. Tools For Vandal Resistant Fasteners: One for each type and size.

PART 2 PRODUCTS

2.01 WATER HAMMER ARRESTORS

- A. Hydropneumatically controlled with permanently sealed expansion chamber pre-charged with non-combustible gas, threaded connection, and conforming to ASME A112.26.1M - Water Hammer Arrestors, and ASSE 1010 - Water Hammer Arrestors.
 - 1. Bellows Type: Stainless steel construction with elastomer or stainless steel bellows.
 - 2. Piston Type: Hard drawn copper body with brass piston, cap and adapter; and elastomer seals.

2.02 HOSE BIBBS

- A. Compression type with polished chrome plated bronze body, renewable units, vacuum breaker with breakaway screw or vandal resistant fastener (ASSE 1011), removable T-handle, and integral threaded wall flange.
 - 1. Connections: 3/4 inch female threaded inlet, and 3/4 inch hose bibb outlet.

2.03 DRAIN VALVE

- A. Cast brass body with renewable units, hose bibb vacuum breaker (ASSE 1011) with drainage feature, and removable cast iron handwheel with vandal resistant fastener.
 - 1. Valve must be completely assembled to make hose connection.
 - 2. Connections: 3/4 inch threaded or solder end inlet, and 3/4 inch hose bibb outlet.

2.04 FASTENERS

- A. Vandal Resistant Fasteners: Torx head with center pin.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the Work of this section in accordance with the manufacturer's printed installation instructions, unless otherwise specified.
- B. Secure external components in place with vandal resistant fasteners or devices which cannot be removed without special tools.

END OF SECTION

SECTION 22 13 00
SANITARY WASTE AND VENT PIPING

PART 1 GENERAL

1.1 SUMMARY

1. Section Includes:
 2. ASTM B302 - Standard Specification for Threadless Copper Pipe.
 3. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
 4. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
- B. Manufacturers Standardization Society of the Valve and Fittings Industry:
 1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
 2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
 3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.2 SUBMITTALS

- A. Product Data:
 1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
 2. Hangers and Supports: Submit manufacturers catalog information including load capacity.
 3. Sanitary Drainage Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.
- B. Manufacturer's Installation Instructions: Submit installation instructions for material and equipment.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.3 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 SANITARY SEWER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A74, service weight.
 - 1. Fittings: Cast iron, ASTM A74.
 - 2. Joints: ASTM C564, rubber gasket joint devices or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hub-less, service weight.
 - 1. Fittings: Cast iron, CISPI 301.
 - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.2 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
 - 1. Carpenter & Paterson Inc.
 - 2. Creative Systems Inc.
 - 3. Flex-Weld, Inc.
 - 4. Glope Pipe Hanger Products Inc.
 - 5. Michigan Hanger Co.
 - 6. Superior Valve Co.
- B. Drain, Waste, and Vent: Conform to ASME B31.9
- C. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.
- D. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
- E. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- F. Wall Support for Pipe Sizes 3 inches (80 mm) and Smaller: Cast iron hooks.
- G. Wall Support for Pipe Sizes 3 inches (100 mm) and Larger: Welded steel bracket and wrought steel clamp.
- H. Vertical Support: Steel riser clamp.

- I. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- J. Copper Pipe Support: Carbon-steel, copper-plated adjustable ring.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove scale and dirt, on inside and outside, before assembly.
- B. Prepare piping connections to equipment with flanges or unions.
- C. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.2 INSTALLATION - HANGERS AND SUPPORTS

- A. Inserts:
 - 1. Provide inserts for placement in concrete forms.
 - 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches (100 mm) and larger.
 - 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- B. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9
 - 2. Support horizontal piping as scheduled.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 6. Support vertical piping at every [other] floor. Support riser piping independently of connected horizontal piping.
 - 7. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.

3.3 INSTALLATION - ABOVE GROUND PIPING

- A. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Maintain gradients.

- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Provide clearances at cleanout for snaking drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- F. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- G. Install piping to maintain headroom. Do not spread piping, conserve space.
- H. Group piping whenever practical at common elevations.
- I. Support cast iron drainage piping at every joint.

END OF SECTION

SECTION 224200

PLUMBING FIXTURES

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, roughing dimensions, and installation instructions for each item specified except fasteners.
 - 1. Deliver cut out data for countertop fixtures to the Owner.
- B. Samples:
 - 1. Water Closet Seat: One seat if other than product specified. Sample will be returned and if approved, may be installed on the Project.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with applicable requirements of FS WW-P-541, and the following standards:
 - a. ANSI/ASME A112.6.1M - Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
 - b. ANSI/ASME A112.18.1M - Plumbing Fixture Fittings.
 - c. ANSI/ASME A112.19.1M - Enameled Cast Iron Plumbing Fixtures.
 - d. ANSI/ASME A112.19.2M - Vitreous China Plumbing Fixtures.
 - e. ANSI/ASME A112.19.6 - Hydraulic Requirements for Water Closets and Urinals.
 - 2. Materials and installations designated as handicapped accessible shall conform with the following:
 - a. ANSI A117.1 - Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.
 - b. The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), (Appendix A to 28 CFR Part 36).
 - c. The Uniform Federal Accessibility Standards (UFAS), (Appendix A to 41 CFR Part 101-19.6).
 - 3. Each fixture carrier support shall be listed by model number in the fixture support manufacturer's Fixture Support Selection Guide as being recommended for support of the appropriate fixture.
- B. Plainly and permanently mark each fixture and fitting with the manufacturer's name or trade mark.

1.03 MAINTENANCE

- A. Special Tools: Deliver to the Owner.
 - 1. Furnish the following tools labeled with names and locations where used.
 - a. Keys for stops (furnished with stops).
 - b. Tools for Vandal Resistant Fasteners: Two for each type and size.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

- A. Vitreous China: First quality, smooth, uniform color and texture, with fused on glaze covering surfaces exposed to view.
 - 1. Surfaces shall be free of chips, craze, warpage, cracks and discolorations. Surfaces in contact with walls or floors shall be flat, with warpage not to exceed 1/16 inch per foot.
 - 2. Color: White.
- B. Porcelain Enameled Cast Iron: Smooth, uniform color and texture, having fused on glaze covering surfaces exposed to view.
 - 1. Material shall show no cracks, chips, craze or discolorations.
 - 2. Enameled surfaces shall be acid resistant unless otherwise specified.
 - 3. Color: White.
- C. Fixture Trim: Brass, bronze, or stainless steel construction; consisting of supply and waste fittings, faucets, traps, stop valves, escutcheons, sink strainers, nipples, supplies, and metal trim.
 - 1. Brass piping: Ips standard weight, with standard weight, 125 lb cast brass fittings.
 - 2. Brass tubing: 18 B & S gage.
 - 3. Stainless steel: 18-8 Type 302 or 304 unless otherwise specified.
- D. Fixture Trim Finishes:
 - 1. Brass or Bronze: Polished or satin finished chrome plating, 0.02 mil chromium over 0.2 mil nickel plating.
 - 2. Stainless Steel: Invisible welds and seams, and unless otherwise specified, polished to No. 4 commercial finish.
- E. Fixture Hold-down Bolts: Steel, plated for corrosion resistance.
 - 1. Cap nuts: Metal, polished and chrome plated.
- F. Combination Faucets: Faucets shall turn counter to each other for the on and off positions.
- G. Vandal Resistant Fasteners: Torx head with center pin.

2.02 MOP SERVICE SINK, P-4

- A. Receptor:

1. Terrazzo: Precast of marble chips and portland cement, ground and polished, with no visible air holes or pits.
 - a. Exterior Basin Height: 12 inches.
- B. Drain Fitting: Cast iron or cast brass body integral or attached to the receptor, ready for connection. Strainer grate shall be polished brass or stainless steel, removable for cleaning.
- C. Service Fitting: Combination faucet with 3/4 inch hose end spout, and with the following features.
 1. 1/2 inch eccentric inlets on 8 inch centers and integral stops.
 2. Integral wall flanges.
 3. Renewable units.
 4. Metal, four arm or lever, indexed handles.
 5. Integral vacuum breaker.
 6. 10 inches from finished wall to center of spout outlet.
 7. Five foot rubber hose with threaded connector to fit the hose bibb.
 - a. Hose wall hook.
- D. Rim Guard: Anodized aluminum, stainless steel, or pre-molded vinyl plastic, as recommended by the receptor manufacturer.

2.03 TYPE P-2 LAVATORY

- A. Fixture: Vitreous china, unitized construction, straight front and sides, flat top graded to bowl, cast-in soap dish, anti-splash rim and front overflow; designed for concealed arm supports.
 1. Dimensions: 20 inches long, 18 inches front to back, 3-1/2 inches front and side apron.
 2. 4 inch high integral back.
- B. Supply Fitting: Individual deck mounted, electronic automatic metering faucet:
 1. Maximum Flow: 0.5 gpm at 80 psi.
 - a. Exception: Metering faucets shall have a maximum flow of 0.25 gallons per cycle.
 2. Over rim spout with aerator.
 3. Renewable operating units.
 4. Vandal resistant assembly.
 5. 1/2 inch inlet lock nut and coupling nut.
- C. Waste Fitting: Pop-up type, actuated by a lift knob on the back ledge.
 1. Metal drain plug.
 2. Solid metal lift knob and cast escutcheon.
 3. 1-1/4 inch tailpiece.
 4. Vandal resistant assembly.
- D. Trap: Cast brass, non-adjustable P trap, 1-1/4 inch tubing inlet, 1-1/2 inch ips outlet.
 1. Bottom cleanout plug.
 2. Ips brass nipple with solid cast brass escutcheon.

- E. Supplies: 3/8 inch ips brass with key operated stops and solid cast brass escutcheons.
 - 1. Wall Supplies: Angle stops with keys.
 - 2. Floor Supplies: Straight stops with keys.
- F. Faucet Hole Cover: Cast brass, rounded top, and threaded shank, with backing plate, lock washer and nut.

2.04 TYPE P-2A LAVATORY, HC

- A. Fixture: Vitreous china, unitized construction, straight front and sides, flat top graded to bowl, cast-in soap dish, anti-splash rim and front overflow; designed for concealed arm supports.
 - 1. Dimensions: 20 inches long, 18 inches front to back, 3-1/2 inch front and side apron.
 - 2. 4 inch high integral back.
- B. Supply Fitting: Individual deck mounted, electronic automatic metering faucet:
 - 1. Maximum Flow: 0.5 gpm at 80 psi.
 - a. Exception: Metering faucets shall have a maximum flow of 0.25 gallons per cycle.
 - 2. Over rim spout with aerator.
 - 3. Renewable operating units.
 - 4. Vandal resistant assembly.
 - 5. 1/2 inch inlet lock nut and coupling nut.
- C. Waste Fitting: 1-1/4 inch tailpiece with cast brass flat perforated strainer grate.
- D. Trap: Cast brass, non-adjustable P trap, 1-1/4 inch tubing inlet, 1-1/2 inch ips outlet.
 - 1. Bottom cleanout plug.
 - 2. Ips brass nipple with solid cast brass escutcheon.
- E. Supplies: 3/8 inch ips brass with key operated stops and solid cast brass escutcheons.
 - 1. Wall Supplies: Angle stops with keys.
 - 2. Floor Supplies: Straight stops with keys.
- F. Faucet Hole Cover: Cast brass, rounded top, and threaded shank, with backing plate, lock washer and nut.

2.05 TYPE P-2B LAVATORY, HC

- A. Fixture: Vitreous china, unitized construction, flat top graded to bowl, cast-in soap dish, front overflow, and self-rimming.
 - 1. Size (approximate):
 - a. Oval: 20 inches x 17 inches.
 - b. Rectangular: 21 inches x 19 inches.

- c. Round: 19 inches.
- B. Supply Fitting: Individual deck mounted, electronic automatic metering faucet:
 - 1. Maximum Flow: 0.5 gpm at 80 psi.
 - a. Exception: Metering faucets shall have a maximum flow of 0.25 gallons per cycle.
 - 2. Over rim spout with aerator.
 - 3. Renewable operating units.
 - 4. Vandal resistant assembly.
 - 5. 1/2 inch inlet lock nut and coupling nut.
- C. Trap: Cast brass, non-adjustable P trap, 1-1/4 inch tubing inlet, 1-1/2 inch ips outlet.
 - 1. Bottom cleanout plug.
 - 2. Ips brass nipple with solid cast brass escutcheon.
- D. Supplies: 3/8 inch ips brass with key operated stops with solid cast brass escutcheon.
 - 1. Wall Supplies: Angle stops with keys.
 - 2. Floor Supplies: Straight stops with keys.

2.06 FIXTURE SUPPORTS AND SUPPORTING DEVICES FOR LAVATORIES, SINKS, AND EQUIPMENT

- A. General: Ferrous metal members of carriers and supporting devices with the exception of chrome plated or porcelain enameled cast iron, shall be factory painted for corrosion resistance.
- B. Wall Mounted Carrier Supports: Plate type system, with steel plates on both sides of the wall and through-bolted. On walls having an integral finish, a single plate wall carrier designed for such installations may be used. Each carrier shall be provided with the appropriate fixture supporting devices specified, or recommended by the Carrier manufacturer's Fixture Support Selection Guide.
 - 1. Concealed Arms: Steel, with fixture locking lugs, leveling screws and a means of attaching, positioning and securing the fixture to the carrier.
 - a. Trim: Polished, Chrome plated metal escutcheon to space fixture two inches from the wall.
- C. Wood Stud Filler Piece: 2 inch x 8 inch wood planking cut to fit between wood studding. Fasten with four 3/8 inch x 2-1/2 inch lag bolts with washers.

2.07 COUNTERTOP SINK, P4A

- A. Material: 18 gage, seamlessly drawn, Type 302 (18-8) stainless steel.
 - 1. Features: Self-rimming, extended back ledge, with faucet punchings spaced on 4 inch centers. Cove corners 1-3/4 inch

- minimum radius; fully coat underside with sound deadening and condensation barrier.
 - 2. Finish: Satin finish exposed surfaces.
- B. Supply Fitting: Top mounted deck type mixing faucet, cast brass base and spout; indexed lever handles.
 - 1. Maximum Flow: 2.5 gpm at 80 psi.
 - 2. 8 inch swing spout.
 - 3. 1/2 inch inlets on 8 inch centers.
 - 4. Renewable units.
 - 6. Supplies: 1/2 inch ips brass, with key operated angle stops, keys and cast brass escutcheons.
- C. Drain Assembly:
 - 1. Stainless steel removable strainer basket with neoprene stopper and 1-1/2 inch tubing tailpiece.
 - 2. 1-1/2 inch cast brass non-adjustable P trap, with bottom cleanout plug.
 - 3. 1-1/2 inch ips brass trap nipple with cast brass escutcheon.
- D. Fastening Devices: Stainless steel spring clip assemblies or clamping devices for securing sink to the countertop.

2.08 VITREOUS CHINA WATER CLOSETS

- A. Fixtures: Vitreous china, full size, elongated bowl with integral flushing rim and jet; trapway at the rear and the outlet centered between a pair of hold down bolt holes.
 - 1. Trapway size: Pass minimum ball of 2 inches.
 - 2. Trap seal: 2 inches minimum.
 - 3. Water surface area: 12 inches x 10 inches minimum.
 - 4. Provisions for flushing:
 - a. 1-1/2 inch top spud for flush valve operation.
 - 5. Floor Supported Fixture Heights:
 - a. Standard Fixture: 14 to 15 inches from finished floor to rim.
 - b. Handicapped Accessible Fixture: 17 to 19 inches from finished floor to top of seat (15-13/16 to 17-13/16 inches from finished floor to top of rim based on 1-3/16 inch seat height).
- B. Operation: Fixture shall flush satisfactorily without extraordinary rise of water level in the bowl.
 - 1. Maximum gallons of water per flush: 1.6 gallons.
- C. Water Closet Floor Flange:
 - 1. For Use with DWV Copper Tubing: Cast brass, 48 ounce minimum weight.
 - 2. For Use with Cast Iron Soil Pipe: Cast iron, 90 ounce minimum weight.

- D. Closet Seat: Extra heavy duty, commercial design; Model 1655-C by Bemis Mfg. Co., Model No. 527-CH by Beneke Corp., or Model No. 9500C by Church Seat Co.
 - 1. Material and Construction: Solid plastic, open front, less cover, molded in one piece with no joints, seams or crevices.
 - 2. The manufacturer's name shall be molded into the seat.
 - 3. Metal check hinges shall be integrally molded into the seat. Hinges, inserts, bearings and posts shall be of brass or stainless steel. Cover upper post and metal exposed above fixture rim with plastic to match seat.
 - 4. Surface shall be hard, polished, impervious to moisture, and not affected by the action of uric acid.
 - 5. Color: White.
- E. Water Closet Types:
 - 1. Type 1 & 1A Water Closet: Floor supported, rear outlet, top spud inlet, siphon jet action, activated by an exposed flush valve.

2.09 VITREOUS CHINA URINALS

- A. Floor Supported Fixture: Vitreous china, stall type.
 - 1. Dimensions (approx.): 38 inches high, 18 inches wide.
- B. Wall Supported Fixture: Vitreous china, with elongated rim, integral trap and extended side shields.
 - 1. Dimensions (approx.): 28 inches high, 18 inches wide, 12 inches front to back.
 - 2. Method of Support: Wall hangers and lugs for bearing plate bolting.
- C. Operation: Fixture shall be designed for use without flushing water.
- D. Fixture Types:
 - 1. Type 3 & P3A Urinal: Wall supported, back outlet and water-free operation.

2.10 URINAL CARRIER

- A. Floor Mounted Carrier Support (For Wall Hung Urinals): 1-1/4 inch ips steel pipe upright supports with block feet arranged with provisions for bolting to the floor slab, and with the following:
 - 1. Hanger Plate: Steel, height adjustable with provisions for mounting and positioning the fixture hanger.
 - 2. Bearing Plate: Steel, adjustable, with bearing studs, nuts and washers.
 - 3. Studs, Nuts and Washers: Steel, treated for corrosion resistance.
 - 4. Fixture Washers: Plastic.
 - 5. Stud thread protectors.
 - 6. Factory Painted.
 - 7. Trim: Polished chrome plated metal cap nuts and washers.

- B. Ferrous metal members of carriers and supporting devices with the exception of chrome plated or porcelain enameled cast iron, shall be factory painted for corrosion resistance.

2.11 FLUSH VALVES

- A. Control Mechanism: Diaphragm or piston operated; do not intermix types.
- B. Maximum Flow Per Flush:
 - 1. Water Closet: 1.1/1.6 gallons dual flush.
- C. Flush Valve Assemblies: Flush valve, stop-check, tailpiece, vacuum breaker, and fixture spud coupling, including wall and spud flanges.
- D. Valve Materials:
 - 1. Valve Body: Brass or bronze.
 - 2. Valve Internal Parts: Corrosion resistant materials that will not be affected by the action of or contact with water.
- E. Operating Features:
 - 1. Valve operators shall employ the non hold-open feature.
 - 2. Piston type valves shall be field adjustable.
- F. Valve Operators:
 - 1. Automatic, electronic with dual flush mode selection. Sloan ECOS or approved equal.
- G. Assembly Components:
 - 1. Flush Pipe: Seamless brass tubing with integral vacuum breaker, No. 18 B & S gage.
 - 2. Fitting: Cast brass.
 - 3. Stop-Check: Brass or bronze body, non rising stem stop valve with a built-in automatic check.
 - a. Exposed Stop-Check: Screwdriver operated with protective cap.
 - b. Concealed Stop-Check: Wheel handle operated.
 - 4. Spud Coupling and Wall Flanges: Cast brass.

PART 3 EXECUTION

3.01 FIXTURE SUPPORT AND SUPPORTING DEVICE INSTALLATION

- A. Install heavy duty floor mounted carrier supports with specified fixture supporting devices for wall type plumbing fixtures.
 - 1. Secure to building construction with lag bolts and metal expansion shields, or other appropriate means as required by the construction encountered.

- B. Fixture Supporting Devices: Attach fixtures by means of the following fixture supporting devices attached to carrier supports.

FIXTURE	SUPPORTING DEVICE
Lavatory, P2 & P2A	Concealed arms.
Lavatory, P2B	Through bolt.
Water Closet	Bolt to comb. carrier and drainage fitting.
Urinal	Fixture hanger and bearing plate.

3.02 FIXTURE INSTALLATION

- A. Install the Work of this section in accordance with the manufacturer's printed installation instructions.
- B. Install fixtures level and at proper height, tighten connections, and install hold-down bolts, cap nuts and cover plates, where required.
- C. Mop Service Sinks:
- Set receptor leveled in bed of mortar laid on clean roughened surface. Remove excess mortar and strike a neat joint.
 - Make connection from drainage pipe to receptor drain.
 - Caulk joints between receptor and wall or floor with Type 1D sealant; strike a neat joint.
 - Install service fittings.
 - Caulk perimeter of fixture; strike a neat joint.
- D. Lavatories:
- Mount lavatories 31 inches from finished floor to rim unless otherwise specified.
 - Mount handicapped accessible fixtures 34 inches from finished floor to rim. Refer to Standard Drawing No. 93/S3013 bound herein, for special clearances required for handicapped accessible fixtures.
 - Caulk perimeter of fixture; strike a neat joint.
- E. Countertop Fixtures:
- Install fixture with securing devices supplied.
 - Set fixture on bedding of sealant, tighten securing devices and remove excess sealant.
 - Caulk perimeter of fixture; strike a neat joint.
- F. Water Closets:
- Wall Supported Fixtures:
 - Set fixture in bed of setting compound; remove excess.
 - After connections are tightened, install cap nuts and washers.

3. Install water closet seats when directed.
 - d. Caulk perimeter of fixture; strike a neat joint.
- G. Urinals:
 1. Wall Hung Fixtures:
 - a. Standard Fixtures: Install wall hung fixtures 24 inches from finished floor to rim.
 - b. Handicapped Accessible Fixtures: Install wall hung handicapped accessible fixtures 14 inches (minimum) to 17 inches (maximum) from finished floor to rim.
 - c. Set bearing nuts on floor mounted carrier supports to position wall hung fixtures 1/16 inch clear of finished wall.
 - d. Caulk perimeter of fixture; strike a neat joint.
 2. After connections are tightened, install cap nuts and washers.
- H. Flush Valves:
 1. Standard Fixtures: Install flush valves on fixture centerline, and at following heights above fixture rim or back to centerline of water inlet to flush valve.
 - a. Water Closet: 11-1/2 inches.
 2. Handicapped Accessible Fixtures: Install flush valves on fixture centerline, and at following height above finished floor to centerline of flush valve operator. Distance between centerline of flush valve operator and centerline of water inlet is 1-1/2 inches.
 - a. Water Closet: Approximately 31-1/2 inches, and mounted on wide side of stall.
 - 1) Coordinate mounting height with Construction Work Contractor to avoid interference with grab bar, and to facilitate flush valve servicing.
 3. Slip joints in flush pipe connections allowed only at fixture spud and vacuum breaker ends; others shall be screwed connections.
 4. Score tubing ends before assembling to assure tight slip joint connections. No score marks shall be visible after assembly.
 5. In utility corridors, solder screwed flush pipe connections.

3.03 CLEANING, FLUSHING AND ADJUSTMENT

- A. Clean fixture and trim. Remove grease and dirt; polish surfaces but leave stickers and warning labels intact.
- B. Flush supply piping and traps; clean strainers.
- C. Adjust stops for proper delivery.
- D. Adjust metering faucets for proper timing.

END OF SECTION

**SECTION 260010
GENERAL PROVISIONS FOR ELECTRICAL WORK**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Provide labor, materials, tools, machinery, equipment, and services necessary to complete the Electrical Work under this Contract. All systems and equipment shall be complete in every aspect and all items of material, equipment and labor shall be provided for a fully operational system and ready for use. Coordinate the work with the work of the other trades in order to resolve all conflicts without impeding the job progress. Contractor shall provide any service, material or equipment not specifically mentioned in these specifications or set forth in the drawings but required to complete this Project without requesting any additional time to complete the Project and without additional cost to the owner.
- B. When an item of equipment is indicated on a floor plan and not shown on associated riser diagram or vice-versa, the Contractor shall provide said item and all required conduit and wiring connections for a complete system as part of the Contract.
- C. Examine the Structural, Plumbing and Electrical Drawings and other Divisions, and Sections of the Specifications in order to determine the extent of the Work required to be completed under this Division. Failure to examine all the Contract Documents for this Project will not relieve this Section and any other Sections of their responsibilities to perform the Work required for a complete fully operational and satisfactory installation.
- D. Contractor shall comply with all laws, regulations, rules, orders, codes, requirements, and the like of federal, state and local governments, courts, governmental authorities, legislative bodies, boards, agencies, commissions and the like ("Laws"). If there is a conflict between or among any Laws and specific requirements of this Contract, then Contractor shall comply with the most stringent Law or requirement in each instance. By noting any specific Law(s) with particularity in this Contract or in any other prior or future communication, Contractor is not relieved of any obligation to comply with all Laws and the Owner does not waive any rights it may have with respect to such compliance.
- E. Provide and pay for all materials, labor, services, equipment, licenses, taxes and other items necessary for the execution, installation and completion of Work indicated in Contract Documents.
- F. Start-up services shall be included in the bid.
- G. All systems, equipment and services specified herein shall be provided complete and ready for use.
- H. Provide approved means of firestopping at all rated spaces for all the

penetrations made during construction to preserve the fire rating of the spaces.

1.02 EXAMINATION OF SITE

- A. The Contractor shall be held to have examined the site and to have compared it with the Drawings and Specifications, and deemed to have been satisfied as to the conditions existing at the site, as relating to the actual conditions of the site at the time estimating the Work, the storage and handling of materials, and all other matters as may be incidental to the Work under the Contract, before bidding, and no allowance will subsequently be made to the Contractor by reason of any error due to the Contractor's neglect to comply with the requirements of this clause.
- B. Verify final locations for rough work with field measurements and with the requirements of the actual equipment being connected.

1.03 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract.

1.04 ELECTRICAL EQUIPMENT

- A. All electrical equipment shall be the latest of the current year in design, material and workmanship, and shall be the type or model called for in these Specifications.
- B. If the type or model specified has been superseded by a later type or model, the latest shall be submitted for approval and shall be provided as part of the Contract.

1.05 SUBMITTALS

Provide as outlined in each individual section of these Specifications, including but not limited to:

- A. Product Data: Submit manufacturer's product data for equipment including capacity, performance charts, test data, materials, dimensions, weights, and installation instructions.
- B. Shop Drawings: Submit manufacture's shop drawings indicating dimensions, weight loading, required clearances, location, and method of assembly of components.

Submittals are mandatory as noted in the respective specifications. Schedules, installation instructions, startup manuals, operation and maintenance manuals, and shop drawings are always required to be submitted.

- C. Special Warranty.
- D. Quality Assurance Submittals.
- E. Operation and Maintenance Manuals.

- F. Test Results and Certificates.
- G. Manuals and Video Tape of the Personnel Training.

1.06 COORDINATION DRAWINGS

- A. Provide coordination drawings. Coordination drawings shall be completed so as not to delay the progress of the Project.s

1.07 CODE COMPLIANCE

- A. Drawings and Specifications:
 - 1. It is the intent of these Specifications that all electric work shall be done in strict accordance with the rules of the local Authority Having Jurisdiction (AHJ), local Utility requirements and with the latest applicable version of the NFPA National Electrical Code. Where the requirement of the Drawings or Specifications exceeds the requirements of the Electrical Code, the requirements of the Drawings and Specifications shall be binding upon the Contractor.
 - 2. Should the AHJ inspect the work and issue a violation, the Contractor shall correct the Work and eliminate the violation as part of the Contract.
- B. Interpretation
 - 1. The electric work detailed in these Specifications and shown on Drawings shall be under the jurisdiction of the Owner, subject to the approval of the AHJ.
 - 2. The Owner shall be the sole source for interpretation of the Contract Documents. Any discrepancies or conflicts shall be brought to the attention of the Owner for clarification.
- C. Materials and Appliance: All materials and appliance shall be approved by the Owner's Representative and installed in accordance with the rules and regulations of the local Building Department, AHJ; certificates of approval including the temporary light and power wiring, shall be obtained by the Contractor and delivered to the Owner's Representative before the Work is finally accepted.

1.08 ELECTRICAL INSTALLATIONS

- A. Coordinate Electrical equipment and materials installation with other building components.
- B. Verify all dimensions by field measurements.
- C. Arrange for chases, slots, and openings to allow for Electrical installations.

- D. Sequence, coordinate, and integrate installations of Electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning and entrance prior to the close of the building.
- E. Provide a coordinated set of drawings for the project, verifying the integration of the installation clearances between the new components and the existing, and submit for approval prior to initiating construction.
- F. Coordinate the cutting and patching of building components to accommodate the installation of Electrical equipment and materials.
- G. Where mounting heights are not detailed or dimensioned, install Electrical services and overhead equipment to provide the maximum headroom possible.
- H. Install Electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting and minimum of interference with other installations.
- I. Coordinate the installation of Electrical materials and equipment above ceilings with suspension system, light fixtures, and all other installations and accessories.

1.09 TESTS

- A. The Contractor shall demonstrate to the Owner operation of all equipment and systems. All tests shall be completed to the satisfaction of the Owner. Each test shall be performed as indicated in the individual specification section.

1.10 GUARANTEES, WARRANTIES, BONDS, AND MAINTENANCE CONTROL

- A. Refer to individual equipment specifications for warranty requirements.
 - 1. Compile and assemble the warranties specified for Electrical work into a separated set of documents, tabulated and indexed for easy reference.
 - 2. Provide complete warranty information for each item to include product or equipment including duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.
 - 3. Warranties for the equipment, workmanship and materials should be provided for the period of one year.
 - 4. Manufacturers', in addition to Contractors' warranties, shall be provided for all Electrical equipment and accessories.
 - 5. All warranties are to start from the date of Substantial Completion.

1.11 OPERATIONS, TRAINING AND MAINTENANCE MANUALS

- A. General
 - 1. Provide procedures and requirements for preparation and submittal of operation and maintenance manuals for each item of equipment. Refer to

individual equipment specifications for maintenance manual additional requirements.

2. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.
 3. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down, and emergency instructions; and summer and winter operating instructions.
 4. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassemble; aligning and adjusting instructions.
 5. Servicing instructions and lubrication charts and schedules.
- B. Bind all the other Sections maintenance manuals in a single final Operating and Maintenance Manual.
- C. Contractor shall videotape all the training sessions for various equipment and systems as specified in individual sections of these Specifications. If a manufacturer's particular equipment item is furnished with a training video, the manufacturer's video shall be provided in addition to the requirements of this Section, not in lieu thereof and at no additional cost to the Owner. Contractor shall be responsible for providing informative videotapes covering all the materials and content outlined in each individual section of these Specifications.

1.12 CLEANING AND REPAIR

- A. On completion of installation, inspect interior and exterior of installed equipment. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.
- B. Contractor shall not leave sharp exposed metal edges (bottom of threaded rods, electrical equipment supports, etc.) that could otherwise present safety hazards to the building's occupants/work staff.

LIST OF SUBMITTALS

<u>SUBMITTAL</u>	<u>DATE SUBMITTED</u>	<u>DATE APPROVED</u>
Product Data	_____	_____
Shop Drawings	_____	_____
Special Warranty	_____	_____
Quality Assurance submittals	_____	_____
Operation and Maintenance Manuals	_____	_____
Test results and certificates	_____	_____
Manuals and video tape of the personnel training.	_____	_____

END OF SECTION

SECTION 260519
WIRING, GENERAL - 600 VOLTS AND UNDER

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The following shall apply to work in this section:
 - 1. Section 260010: "General Provisions for Electrical Work".

1.02 DESCRIPTION OF WORK

- A. Install all conductors as indicated on the Drawings, as specified, or as required for the proper operation of the various systems specified. All connections shall be made complete, and all systems shall be energized and tested for proper operation.
- B. The Drawings generally indicate the wiring required for the installation and proper operation of the systems specified. If the Contractor chooses to install a system requiring different wiring, any alternate material and labor required to furnish and install the wiring for the new alternate system shall be furnished by the Contractor as part of this Contract without extra cost to the Owner.
- C. When an item of equipment is indicated on a floor plan and not shown on associated riser diagram or vice-versa, the Contractor shall provide said item and all required conduit and wiring connections for a complete system as part of the Contract.

1.03 RELATED SECTIONS

- A. Section 260533: "Raceways."

1.04 QUALITY ASSURANCE

- A. Wire manufactured over one year prior to delivery to the site, will not be accepted.
- B. Tapes for splices or termination shall be dated by the tape manufacturer to indicate that they have been manufactured no longer than six months prior to use in the Work of this Section.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Conductors shall be of an approved manufacturer and shall be delivered at the building in original packages or on reels, and shall have the tag of the manufacturer attached thereto indicating:
 - 1. Contractor's name.
 - 2. Project title and number.
 - 3. Date of manufacture (month & year).
 - 4. Manufacturer's name.
 - 5. Data which explains the meaning of coded identification (UL assigned electrical reference numbers, UL assigned combination of color marker threads, etc.).
- B. Store material in a clean, dry space and protect from weather.

1.06 SUBMITTALS

- A. Submit the following accordance with the requirements of the specifications:
 - 1. Splice kit materials and installation procedures.
 - 2. Manufacturer's certification that its product meets the Owner's Standards and Specifications.
- B. Submit field test results for wires and cables, including "Megger" readings with the method used.
- C. Corrected (as built) Riser Diagrams for all systems including Light and Power System, etc., shall be provided by the Contractor. Riser diagrams shall be on mylar and shall be installed behind glass faces in approved wooden frames. Riser diagrams shall be installed where and as directed by the Owner.

1.07 COLOR CODE ELECTRIC LIGHT AND POWER WIRE

Color code for branch circuits and feeders are as follows:

- A. 120/208 Volt Circuits Conductors
 - Black - Phase "A"
 - Red - Phase "B"
 - Blue - Phase "C"
 - White - Neutral
 - Green - Ground
- B. 277/480 Volt Circuit Conductors
 - Brown - Phase "A"
 - Yellow - Phase "B"
 - Orange - Phase "C"
 - White - Neutral

Green - Ground

Where color coded cable is not available, the contractor shall certify same in writing and request permission for overlap - color taping of conductors (min. length 6" in.) in all visible and accessible locations, pull boxes, junction boxes, outlet boxes, etc.

- C. Color code for wiring other than electric light and power, in accordance with ICEA & NEMA WC-30 "Color Coding of Wires."

PART 2 – PRODUCTS

2.01 WIRES AND CABLES

- A. General

- 1. Acceptable Companies

- a. American Insulated Wire Corp., Belden Wire & Cable, Cable Corp., Cerro Wire & Cable Corp., Collyer Insulated Wire Co., Ettco Wire and Cable Corp., General Electric Co., Hi-Tech Cable Corp., Philadelphia Insulated Wire Co., Pirelli Cable Corp., Rome Cable Corp., Royal Electric, Southwire Co., or Triangle PWC, Inc.
 - b. Conductors shall conform to A.S.T.M. and I.P.C.E.A. standards, and be UL listed and labeled.
 - c. Conductors shall have 600 volts insulation and shall be of soft-annealed-uncoated copper of 98% conductivity. Copper clad conductors are not acceptable. Conductors No. 10 and smaller for lighting and power shall be solid; conductors No. 8 and larger shall be stranded. Control & communication wiring shall be stranded.
 - d. All conductors shall have identifiable lettering on the insulator jacket as to voltage rating, wire type, A.W.G. size, insulation, and manufacturer I.D.
 - 2. Conductors in conduit in contact with the earth, in slab contiguous to the earth, outside the building, and service feeders to Main Distribution Boards from Current Transformers shall be type THWN.
 - 3. Conductors shall meet the requirements of the National Electrical Code and shall be of a type and manufacture which has the approval of a recognized testing agency for the anticipated use. Evidence of such approval shall be supplied to the Owner.
 - 4. Unless otherwise shown on the Contract Drawings, Lighting Fixture wires shall be stranded type TFFN.

- B. Description

- 1. Type THHN/THWN-75°C, THHN-90°C shall have a thermo-plastic polyvinyl chloride insulation with nylon jacket for 600 volts, and shall

comply with ASTM, IPCEA S-61-402 (latest edition) and NEMA WC5 (latest edition).

2.02 SPLICES AND TAPS

A. General

1. All splices shall be UL approved and per National Electric Code and with accepted practice and good workmanship. The conductivity and physical strength of splices shall be equal to that of the unspliced conductor.
2. All splicing and terminating materials shall be compatible so that no one material will adversely affect the physical or electrical properties of any other, or of the wire or cable itself. Also, all connectors, splicing hardware, and lugs shall have a temperature rating that is equal to or greater than the conductor.
3. All materials for making splices and terminations shall be specifically designed for use with the type of wire or cable, insulation and installation and operating conditions of the specific application.

2.03 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" minimum thickness, machine engraved to expose inner core color (white).
2. Aluminum: Standard aluminum alloy plate stock, minimum .032" thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Prior to pulling wires and cable, clean raceway systems of all foreign matter and perform all operations necessary so as not to cause damage to wires and cables while pulling. Install all conductors in raceways after raceway system is completed.
- B. Prior to pulling wires and cables into underground conduit systems, place a feeding tube at the entrance end of such systems.

3.02 INSTALLATION

A. General

1. Keep wires and cable clean & dry at all times.
2. Seal wire and cable ends with watertight end seals.

3. Before splicing or terminating wires and cables, make a thorough inspection to determine that water has not entered the wires and cables or that the wires and cables have not been damaged.
4. Use adequate lubrication when installing cables in conduits and raceways. Any pulling compounds shall be compatible with the finish of the wires and cables furnished. No grease, oil, or lubricant other than wire-pulling compounds specified may be used to facilitate the installation of conductors.
5. All circuits shall have their own dedicated neutral. Combined neutrals will only be permitted for balanced three phase lighting.

B. Splices

1. Dry Locations:
 - a. For Conductors No. 8 AWG or Smaller: Use spring type pressure connectors or indent type pressure connectors with insulating jackets (except where special type splices are required).
 - b. For Conductors No. 6 AWG or Larger: Use uninsulated indent type pressure connectors. Fill indentions with electrical filler tape and apply insulation tape to insulation equivalent of the conductor, or insulate with heat shrinkable splices.
 - c. Gutter Taps in Panelboards: Install gutter tap, 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 are used).
3. Wet Locations: Use uninsulated indent type pressure connectors and insulate with resin splice kits or heat shrinkable splices. Exception: Splices above ground which are totally enclosed and protected in NEMA 3R, 4, 4 x enclosures may be spliced as specified for damp locations.

C. Identifications of Wires and Cables

1. Each wire and cable shall be identified by its circuit in all cabinets, boxes, manholes, handholes, wireways and other enclosures and access locations, and at all terminal points.
2. The circuit designations shall be as shown on the Contract Drawing or as approved on shop drawings. Tags shall be attached to wires and cables in such a manner as to be readily visible.
3. The tape ties shall be wrapped around all conductors comprising the circuit or feeder to be identified.
4. Wires and cables which are arcproofed shall also be identified outside the applied arcproofing.

D. Terminations

1. For Conductors No. 10 AWG or Smaller: Use terminals for:
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 (reduce section no longer than 1 ft.). Use compression or mechanical type connectors suitable for reducing connection. Insulate with filler tape and electrical tape specified above. Cutting of cable strands to fit terminal is not acceptable.

3.03 FIELD TESTS

- A. Test all feeder cables installed under this Contract with a 1000-volt Megohmmeter. Furnish the Owner's Representative with a copy of the "Megger" readings together with an outline of the method used. Any cable not attaining 100 meg shall be replaced.

Feeder cables shall be defined as cables feeding service switchgear, distribution panels, power panels, lighting panels, control panels and disconnect switches rated 60 amps or larger.

3.04 COMMON NEUTRAL CONDUCTOR

- A. A common neutral may not be used. Supply separate neutral conductors for each circuit.

3.05 EQUIPMENT GROUNDING CONDUCTOR

- A. Install equipment grounding conductor:
 1. Where specified in other Sections, or indicated on the Drawings, or as required by Code.
 2. In conjunction with circuits recommended by equipment manufacturers to have equipment grounding conductor.
 3. Where flexible metal conduit, sealtite, and surface metal raceway are used.
- B. Equipment grounding conductor may be bare or identified with a continuous green color insulation.

3.06 INSULATED CONDUCTOR SCHEDULE - TYPES AND USE

A. Electric Light and Power:

1. THHN/THWN: Wiring in dry or damp locations (except where special type insulation is required)s

END OF SECTION

SECTION 260529
FASTENERS, ATTACHMENTS, AND SUPPORTING DEVICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The following shall apply to work in this section:
 - 1. Section 260010: "General Provisions for Electrical Work".

1.02 SUBMITTALS

- A. Shop Drawings
 - 1. Provide support details if different from methods specified or shown on the Drawings.
 - 2. Provide support details for all lighting fixtures, designated by fixture type.
- 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): Hilti's Drop-In Anchor, Molly/Emhart's Parasleeve Series, Phillips' Red Head AN, HN, FS Series, Ramset's Dynabolt Series, Rawl Double, or Rawl Single.
- 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's Red Head J Series, or Ramset's Dynaset Series.
- E. Stud Anchors (FS FF-S-325 Group VIII, Type 2): Phillips's Red Head JS Series.
- F. No Plastic Anchors.

2.02 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:

Provide galvanized fasteners for exterior use, or for items anchored to exterior walls, except where stainless steel is indicated.

1. Standard Bolts and Nuts: ASTM A307, 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.

2.03 RIVET FASTENERS

- A. 1/4" diameter, threadless fasteners distributed by Trinity Group Fastening Systems, Inc., 733 Ridgedale Avenue, East Hanover, NJ.

2.04 HANGER RODS

- A. Galvanized or cadmium plated steel, unless otherwise specified; fully threaded or threaded each end, with nuts as required to position and lock rod in place.

2.05 "C" BEAM CLAMPS

A. With Conduit Hangers:

1. For 1" Conduit Maximum: Caddy/Erco Products Inc.'s BC-8P and BC-88_SM Series, or Thomas Industries Inc.'s HIT CH Series.
2. For 3" 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" 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" Hanger Rods: Caddy/Erco Products Inc.'s BC, Kindorf's 500, 510, Thomas Industries Inc.'s HIT MC, or Unistrut Corp's P1648S, P2398S, P2675, P2676.
2. For 3/8" Hanger Rods: Caddy/Erco Products Inc.'s BC, Kindorf's 231-3/8, 502, or Unistrut Corp's P1649AS, P2401S, P2675, P2576.
3. For 1/2" 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" Rods: Unistrut Corp's P1651A beam clamp and P1656A Series anchor clip.
5. For 3/4" Rods: Unistrut Corp's P1653S beam clamp and P1656A Series anchor clip.

2.06 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"), B-12 (1-5/8" x 2-7/16"), B-11 (1-5/8" x 3-1/4").
 2. Kindorf's B-900 (1-1/2" x 1-1/2"), B-901 (1-1/2" x 1-7/8"), B-902 (1-1/2" x 3").
 3. Unistrut Corp's P-3000 (1-3/8" x 1-5/8"), P-5500 (1-5/8" x 2-7/16"), P-5000 (1-5/8" x 3-3/4").
 4. Versabar Corp.'s VA-1 (1-5/8" x 1-5/8"), VA-3 (1-5/8" x 2-1/2").

2.07 MISCELLANEOUS FITTINGS

- A. Side Beam Brackets
B-Line 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-21-- 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.
- E. Supporting Fittings for Pendant 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/Erico 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, or as detailed on the Contract Drawings.
- C. Make attachments to structural steel wherever possible.

3.02 FASTENER SCHEDULE

A. Material

Use cadmium or zinc coated anchors and fasteners in dry locations. Use hot dipped galvanized or stainless steel anchors and fasteners in damp and wet locations. For corrosive atmospheres or other extreme environmental conditions, use fasteners made of materials suitable for the conditions.

B. Type 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. Rivet fasteners to fasten items to plywood backed gypsum board ceilings.
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" thick.
 - c. Do not support a load, in excess of 250 lbs from any single welded or powder driven stud.
 - d. Do not used powder driven fasteners in precast concrete.
6. Powder driven tools and fasteners shall not be used unless prior written approval is received from the Owner.

3.03 ATTACHMENT SCHEDULE

A. General

Make attachments to structural steel or steel bar joist 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.
2. Attachment to Concrete Filled Steel Decks (Total thickness, 2-1/2" or more):
 - a. Before or After Fill Has Been Placed: Make attachments to the deck with welded studs. Do not support a load in excess of 250 lbs from a single welded stud.
 - b. Before Fill Has Been Placed: Use thru-bolts and fish plates.
3. Attachment to Metal Stud Construction: Use supporting fasteners manufactured specifically for the attachment of raceways and boxes to metal stud construction.

3.04 CONDUIT SUPPORT SCHEDULE

- A. Provide number of supports as required by National Electrical Code. Exception: Maximum support spacing allowed is 4'-0" for conduit sizes 3" and larger supported from wood trusses.
- 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 surfaces.
- 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 runners bars, T-Bars, etc.
 1. Conduit Sizes 2-1/2" and Smaller: Support conduit from ceiling supports or from construction above ceiling.
 2. Conduit Sizes Over 2-1/2": Support conduit from beams, joist, or trusses above ceiling.

END OF SECTION

SECTION 260533 RACEWAYS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The requirements and general provisions of Section 260010 shall apply to the work of this Section.

1.02 SCOPE

- A. Provide raceways, fittings, boxes and accessories indicated on the Drawings, herein specified or required for the complete and proper operation of the systems specified or indicated on the Drawings.
- B. Low voltage systems shall be installed in RGC, surface metal raceway or in a dedicated cable tray.
- C. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
- D. Where the Contractor selects and installs an item of equipment which requires either additional conduit, boxes, fittings, etc., or a modification of the conduit system indicated on the Drawings, such additional conduit, boxes, fittings, etc., shall be provided and such modifications shall be performed by the Contractor as part of this Contract and without extra compensation from the Owner.
- E. The Contractor shall coordinate the work with all trades so that the completed installation, particularly partitions and walls, will present a finished appearance. There shall be no structural malformation caused by improper installation of electrical equipment and no observable spaces between electrical equipment and the structure.

1.03 SUBMITTALS

- A. Product data.

PART 2 – PRODUCTS

2.01 RACEWAYS

- A. Rigid Galvanized Conduit (RGC)
 - 1. Rigid conduit shall be in standard lengths with manufacturers' name, nominal diameter and Underwriters label (U.L.) stamped on each length. Material shall be galvanized steel. RGC shall meet the requirements of Article 344 of the National Electrical Code.

B. Electric Metallic Tubing (EMT)

Conduit shall be in standard lengths with manufacturer's name, nominal diameter and UL listing stamped on each length. Material shall be galvanized steel and meet requirements of Article 358 of the N.E.C..

C. 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), as manufactured by American Flexible Conduit Co., Cerro Conduit Co., Ettco Wire and Cable Corp., or International Metal Hose Co.

D. Armored Cable (MC)

Metal clad cable of the armored type shall be type AC. It shall be industry standard, factory fabricated assembly of cross linked polyethylene insulated nylon jacketed 98% conductivity soft drawn copper conductors, and a flexible metallic covering of interlocked galvanized steel or aluminum. A continuous ground conductor in intimate contact with the armor for the entire cable length shall be included in the assembly. The assembly shall be UL listed and rated 600 volts, 90°C.

Armored cable shall be manufactured by AFC/Monogram, General Cable, Triangle, or National Electric.

E. Liquidtight Flexible Metal Conduit

Anaconda Metal Hose Anamet Inc.'s Sealtite Type UA, Electri-Flex Co.'s Type LA Liqueatite, Flexible Technology Corp.'s Type UA, or Universal Metal Hose Co.'s Universal Sealflex U.

F. Rigid Nonmetallic Conduit, Fittings, and Accessories

UL categorized as Rigid Nonmetallic, Schedule 40 and Schedule 80 PVC conduit (identified on UL Listing Mark as Rigid Nonmetallic Conduit Aboveground and Underground Schedule 40; Rigid Nonmetallic Conduit Aboveground and Underground Extra Heavy Wall Schedule 80), by Beck Mfg./Picoma Industries, Cantex Inc., Carlon/Div. Of Lamson and Sessions, Ipex Inc., J-M Mfg. Co. Inc., National Pipe & Plastics Inc., or Queen City Plastics Inc.

2.02 FITTINGS AND ACCESSORIES

All fittings and accessories must be U.L. approved and compatible with selected raceways.

A. Insulated Bushings

- B. Plastic Bushings for 3/4" Conduit
- C. Insulated Grounding Bushings
- D. Connectors, Couplings and Locknuts
- E. Conduit Bodies (Threaded)

Malleable Iron/Zinc Electroplate: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers.
- F. Expansion Fittings

Zinc Electroplate Finish with external bonding jumper.
- G. Connectors and Couplings

Waterproof Hub connectors shall be used on all exterior installations. T&B # 370.
- H. Deflection Fittings
- I. Sealing Fittings
- J. Expanding Silicone Foam
- K. Vertical Conductor Supports
- L. Drag Line

1/8" polypropylene monofilament utility rope.

2.03 CONDUIT SIZES

- A. The sizes of conduits and raceways indicated on the Drawings are the minimum acceptable by the Owner's Representative for the number of conductors to be installed. Where neither Drawings nor the Specifications indicate a size, conduits shall be not less than 3/4 inch size (nominal diameter) or of such larger size as required by the New York State Electric Code for the number of conductors specified or indicated on the Drawings.

Where the Drawings or the Specifications indicate existing conduit is to be extended, the new conduit extension shall be the same size as the conduit extended, unless otherwise specified in the Drawings or the Specification.

2.04 INSULATED BUSHINGS

- A. All conduits having a nominal diameter of 1-inch or larger shall be equipped with insulated bushings meeting either of the following requirements:
 - 1. Metal bushings, cadmium plated and insulated with Bakelite.
 - 2. Bushings of heat treated aluminum alloy with phenolic treated fiber insulation.

2.05 HANGERS AND STRAPS

A. Hangers

Separate hangers shall be installed for supporting conduits. Wherever possible hangers shall be supported from concrete slab by inserts. Prefabricated adjustable metal channel framing and associated fittings the equal of Kindorf, Unistrut, Power-Strut or Binkley will be acceptable in lieu of hangers if of equal mechanical strength.

Hangers and fittings shall be rust resistant treated and where installed concealed in hung ceilings need not be painted. Where installed exposed, apply finish coat of aluminum paint or color to match, as approved. Conduits on hangers shall be firmly attached to each hanger by using approved "U" bolts or straps.

Hangers and piping installed by other trades shall not be used for supporting electric conduits.

B. Straps and backs

Straps shall be properly formed to rigidly support conduits, and to properly space conduits from each other and from the ceiling or wall; minimum acceptable thickness shall be 1/16". Straps shall be galvanized or cadmium plated after they have been formed and drilled.

Maximum spacing of straps shall be five (5) feet for conduits not mounted on hangers.

Straps for use on the exterior of the building or in pipe tunnels shall be hot dipped galvanized.

C. Vertical Supports

At each floor provide rust resistant iron conduit clamps or other approved support at floor slabs on all vertical feeder conduits. Supports shall be as manufactured by Kindorf, Steel City, OZ/Gedney and Kellem.

2.06 SLEEVES FOR CONDUIT

A. Provide sleeves for all electrical conduits passing through foundation, floors, roofs, beams, and at other areas where indicated on Drawings. Provide as detailed on Drawings and as specified herein.

1. Interior floors' roofs: Provide galvanized sheet steel sleeve, 20 gauge. Provide 1" flange at bottom end for securing purposes. Sleeve ends flush with ceiling surfaces, and top of finished floors or roof.
2. Sleeves passing through fire-rated walls, floors, roofs, ceilings, and other areas where indicated: the space between sleeve and pipe/conduit shall be fire stopped to comply with fire rating of assembly through which it passes.

PART 3 – EXECUTION

3.01 RACEWAY INSTALLATION - GENERAL

A. General Requirements for Raceway

1. Make all cuts square.
2. Ream out all burrs from ends.
3. Couple sections together utilizing fittings specifically designed for use with the raceway.
4. Make up raceway to cabinets and boxes utilizing steel or malleable iron fittings with insulated throats, and specifically designed for the purpose.
5. Equip all conduit runs, which cross building expansion or control joints with expansion fittings having flexible grounding bonds by passing sliding parts. Arrange expansion fittings so that sliding action is not impeded.
6. During installation, cap all runs left unfinished or unattended. Also cap terminations of finished runs until wires and cables are to be pulled in. For capping, utilize fittings manufactured specifically for the purpose. Exclude paper or wood plugs.
7. Where embedded in concrete, utilize concrete compression type couplings, connectors and fittings of a type, which assures ground continuity.
8. Coat all threads with conductive, oxide inhibiting compound.

B. Not Used.

C. Number of Raceways

Do not change number of raceways to less than the number indicated on the Drawings unless prior approval is received. Existing raceways may be reused if the Contractor meets the following conditions:

1. The existing raceway must be of adequate size for the new conductors to be installed therein. More circuits may be enclosed by existing raceways than the circuiting shown on the Drawings provided conductor sizes are increased to compensate for derating.
2. Remove existing conductors.
3. Demonstrate to the Owner 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" and larger.
 6. Install vertical conductor supports to replace existing or missing vertical conductor supports.
 7. Install extension collars on existing boxes when the number of new conductors installed therein exceeds code.
- D. Raceways for Future Use (Spare 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. Install a dragline in each raceway.
- E. Conduit Installed Concealed in Existing Construction
- In existing buildings new conduit systems shall be installed, in the following manner:
1. Where new partition walls and new hung or furred ceilings are being erected the conduits and related equipment shall be installed concealed in walls and in hung or furred ceilings.
 2. Rigid Conduits must be used for conductors of the fire alarm system stairway lights, and exposed feeders.
- F. Conduit Installed Exposed
1. Work shall be done in neat and workmanlike manner at right angles and parallel to building walls and structure.
 2. Install vertical runs perpendicular to floor.
 3. Install runs on the ceiling perpendicular or parallel to the walls.
 4. Install horizontal runs parallel to the floor.
 5. Do not run conduits near heating pipes.
 6. Installation of conduit directly on the floor will not be permitted.
- G. Conduit Size: Not smaller than 3/4" electrical trade size.
- H. Conduit Bends
- For 3/4" conduits, bends may be made with manual benders. For all conduit sizes larger than 3/4" manufactured or field fabricated offsets or bends may be used. Make field fabricated offsets or bends with an approved mechanical/hydraulic bender.

3.02 RACEWAY SCHEDULE

A. Rigid Galvanized Steel Conduit (RGC)

1. Install in all locations, unless otherwise specified or indicated on the Drawings, including but not limited to the following:
 - a. Conduits installed exposed up to 10'-0" AFF. Exposed risers shall be RGC for the entire vertical run.
 - b. Rigid conduit shall be used for exposed work in Mechanical Spaces and in unfinished sections of the building.

B. Electrical Metallic Tubing (EMT)

Provide EMT for feeders and branch circuits for power, lighting and low voltage systems installed indoors.

C. Flexible Metal Conduit

Install for all connections to vibrating equipment, or as otherwise specified and as detailed as follows:

1. Use for final conduit connection to recessed lighting fixtures in suspended ceilings. Use 4 to 6 ft. of flexible metal conduit (minimum size 3/4") between junction box and fixture. Locate junction box at least 1 ft. from fixture and accessible if the fixture is removed.
2. Use 1 to 3 ft. of flexible metal conduit for final conduit connection to:
 - a. Motors with open, drip-proof or splash-proof housings.
 - b. Equipment subject to vibration (dry locations).
 - c. Equipment requiring flexible connection for adjustment or alignment (dry locations).
3. Use for concealed branch circuit conduits above existing non-removable suspended ceilings where conduit 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" deep.
5. Flexible steel conduit shall be attached to boxes or to rigid conduits by means of connectors having twin screw fastenings, or other approved type, each of which will separately and securely hold the flexible conduit in place.
6. In all cases install equipment-grounding conductor in the flexible raceway and bond at each box or equipment to which flex is connected. The Contractor is advised that grounding conductors are not shown on the Drawings.

D. Liquidtight Flexible Metal Conduit

1. Use 1 to 3 ft. of liquidtight flexible metal conduit for final conduit connection to:
 - a. Motors with weather-protected or totally enclosed housings.
 - b. Equipment requiring flexible connection for adjustment or alignment (damp and wet locations).
- E. General Requirements for Raceway
 1. Make all cuts square.
 2. Ream out all burrs from ends.
 3. Couple sections together utilizing fittings specifically designed for use with the raceway.
 4. Make up raceway to cabinets and boxes utilizing steel or malleable iron fittings with insulated throats, and specifically designed for the purpose.
 5. Equip all conduit runs, which cross building expansion or control joints with expansion fittings having flexible grounding bonds by passing sliding parts. Arrange expansion fittings so that sliding action is not impeded.
 6. During installation, cap all runs left unfinished or unattended. Also cap terminations of finished runs until wires and cables are to be pulled in. For capping, utilize fittings manufactured specifically for the purpose. Exclude paper or wood plugs.
 7. Where embedded in concrete, utilize concrete compression type couplings, connectors and fittings of a type, which assures ground continuity.
 8. Coat all threads with conductive, oxide inhibiting compound.

3.03 FITTINGS AND ACCESSORIES SCHEDULE

- A. General
 1. 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.
 2. 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.
 3. Use caps or plugs to seal ends of conduits until wiring is installed (to exclude foreign material).
 4. Use insulated grounding bushings on the ends of conduits, which are not directly connected to the enclosure (such as stub-ups under equipment, etc.) and bond between bushings and enclosure with equipment grounding conductor.
 5. Use expansion fittings where raceways cross expansion joints.

6. Use deflection fittings where raceways cross expansion joints, which move in more than one plane.
 7. Use two (2) locknuts and an insulated bushing on end of each conduit entering sheet metal cabinet or box. Terminate conduit ends within cabinet/box at the same level. Plastic bushings may be used for 1/2" & 3/4" conduits.
- B. For Rigid 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 Liquidtight Flexible Metal Conduit: Use liquidtight connectors.
- F. For Surface Metal Raceway: Use raceway manufacturer's standard fittings and accessories.
- G. Short Radius Elbows
- Short radius elbows shall be installed where indicated on the Drawings and/or as required. A short radius elbow shall consist of a T & B No. 470 series bushed elbow and floor coupling, Appleton, R & S., 1901 or other approved equal. The end of the coupling shall be flush with floor.

3.04 FLOOR AND WALL PENETRATIONS

- A. Plug all penetrations through fire rated floors and walls with a three hour rated, fire stop penetration kit as manufactured by Hevi-Duty/Nelson or approved equal, consisting of:
1. Type CMP Firestop Compound or an approved equal.
 2. 7" x 7" panel (large penetrations).
 3. Type CLK Firestop Caulk.
 4. Panel support material and ceramic fiber as required, to be utilized for large penetrations.

3.05 EXISTING RACEWAYS

- A. Remove all existing unused exposed conduits and other related equipment in the areas to be refurbished. All existing concealed conduits not indicated to be reused shall be abandoned. Any existing conduits to be reused shall be cleaned to remove scale and burrs.

S

3.06 ROUTING OF CONDUITS

- A. The routing of conduits, as shown on the Drawings, is approximate, only unless dimensions are indicated. Conduit runs as shown on risers and Drawings are generally diagrammatic. The Contractor shall follow the general routing shown on the risers or Drawings (e.g. whether overhead or underneath) and furnish and install all necessary offsets, fittings, wiring and miscellaneous hardware, to run from one point to another. The actual routing shall be subject to the approval of the Owner's Representative.
- B. Conduits shall not be run above or in close proximity to boilers or hot pipes; nor shall conduits be run directly beneath water pipes.
- C. Exposed conduits shall be rigidly fastened to structure, or to rigid hangers or angle irons connected to structure at intervals not exceeding eight ft. Exposed conduits crossing expansion joints, conduits shall have approved expansion fittings in line or at the pull box.
- D. Where the conduits or surface metal raceways are installed exposed they shall follow the architectural lines of the enclosure and shall be run as to be as inconspicuous as possible. Conduits or surface metal raceways shall not be installed diagonally on ceilings, walls or columns.

3.07 CONCEALED CONDUITS

- A. Conduits from distribution points such as panelboards, fire signal control board, sound control cabinet, inter-connecting boxes, and the like, to outlets for switches, receptacles, lighting fixtures, fire signal stations, bells, buzzers, horns, telephones, clocks, loudspeakers, etc., and between these outlets shall be installed concealed where possible and installed in accordance with approved Shop Drawings.
 - 1. Conduits in Hung and Furred Ceiling:
 - a. In hung ceilings the conduits must be run so as not to interfere with pipes or ducts. Groups of conduits shall be suspended above the hung ceiling upon separate hangers installed by the Contractor. Hangers will not be required for conduits to and between outlets of lighting fixtures located on or in hung ceilings or to wall switch.
 - b. Single conduits may be laid on and fastened to angle supports of the hung and furred ceilings.

3.08 CONDUITS FOR MOTORS

- A. Prior to installing conduits for motors, the Contractor shall verify locations of motor connections with trades furnishing motors and shall run conduits accordingly.

3.09 PAINTING

- A. All exposed conduits and raceways in unfinished portions of the building, such as the cellar, etc., including boxes of all kinds, except those of motor control equipment, (manufacturers motor control housings) shall not be painted. All exposed conduits and raceways including boxes in finished parts of the building shall be painted. Painting shall consist of a prime coat and a finished coat, color as selected. Factory painting will be accepted as a prime coat.

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, Racor/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):
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 OUTLET BOXES AND RELATED PRODUCTS FOR FIRE RATED CONSTRUCTION

- A. Parameters For Use of Listed Metallic Outlet or Switch Boxes: UL Electrical Construction Equipment Directory - Metallic Outlet Boxes (QCIT).
- B. Wall Opening Protective Materials: As listed in UL Fire Resistance Directory - Wall Opening Protective Materials (CLIV), or UL Electrical Construction Equipment Directory - Wall Opening Protective Materials (QCSN).

PART 3 EXECUTION

3.01 PREPARATION

- A. Before proceeding with the installation of junction and pull boxes, check the locations with the Director'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:

Switches	4'-0"
Single & Duplex Receptacles	1'-6"
Thermostats	5'-0"

- 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 Junction and Pull Boxes: Use galvanized steel boxes with flush covers.
 - c. 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):
 - 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.
- D. Stencil cover of pullboxes used on systems over 600 V, in white lettering minimum 1/2 inches high, the words "DANGER HIGH VOLTAGE - KEEP OUT".

END OF SECTION

SECTION 262815
OVERCURRENT PROTECTIVE DEVICES, CIRCUIT BREAKERS AND FUSES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The following shall apply to work in this section:
 - 1. Section 260010: "General Provisions for Electrical Work".

1.02 DESCRIPTION OF WORK

- A. This Section describes the type of circuit breakers and fuses to be provided in safety switches, switchboards, and panelboards.

1.03 SUBMITTALS

- A. Product Data

1.04 SPARES

- A. Provide and deliver the following spare fuses:
 - 1. One set of three for each Service Switch.
 - 2. Three (3) fuses of each type and size for all other fuses.

PART 2 – PRODUCTS

2.01 CIRCUIT BREAKERS

- A. General

Circuit breakers shall be thermal-magnetic type, conforming to the following Specifications:

- 1. Connection to bus shall be by "bolt-on" (or as existing). Plug-in type circuit breakers are not acceptable.
- 2. Breakers shall be equipped with arc chutes or other approved suitable means of quenching arcs.
- 3. Breakers shall have a quick-break operating mechanism on automatic operation.
- 4. Handles of breakers shall be "trip free".
- 5. Handles of breakers shall plainly indicate whether breaker is in "ON", "OFF" or tripped position.

6. Breakers shall be designed to carry 100% of trip rating continuously; to have inverse time delay tripping above 125% of trip rating; and to trip instantaneously at 1000% of trip rating.
7. Multi-pole breakers shall have barriers between poles.
8. Multi-pole breakers shall have a separate tripping element for each pole. Each tripping element shall open all poles. Multi-pole breakers shall have one handle controlling all poles.
9. Breakers of 225-ampere trip rating or less shall have non-tamperable, permanently set trip elements enclosed and sealed in molded composition housing.
10. Single pole breakers shall be rated for not less than 120 volts, A.C.; multi-pole breakers shall be rated for not less than 250 volts A.C.
11. All breakers shall be manufactured in accordance with standards of the National Electrical Manufacturers Association and shall bear Underwriters Laboratories label.
12. Circuit breakers shall have not less than 15-ampere trip ratings, unless otherwise indicated on Drawing or required for the circuit protected.
13. Circuit breakers protecting three phase circuits shall be of the three-pole type.
14. Where spaces for future breakers are required, copper connections for mounting of future breakers shall be provided.
15. For single phase 120-volt or 277 volt loads provide Westinghouse Electric Corp, "Quicklag" by General Electric, Challenger Electric, Siemens or Square D. or as existing.
16. For 208 volt or 480 volt circuits to single phase equipment, provide two (2) pole breakers as manufactured by Westinghouse Electric Corp., Challenger, General Electric, Siemens, or Square D Company with time curve 1.
17. For 3-phase, 208 volt or 480 volt circuits to three phase equipment provide three-pole breakers with time curve 1 as manufactured by Westinghouse Electric Corp., General Electric, Challenger Electric, Siemens or Square D.
18. Circuit breakers shall be mounted in standard panelboards as indicated on the drawings. Frame and sizes of circuit breakers shall conform to the following:

Trip Ratings-Amps	No. of Poles	Frame Size
15-70	1	100 AMP – Frame 240V: Square D, Type QOB-VH (22,000 I.C.) 480/277V: EHB (14,000 I.C.)
15-100	2&3	100 AMP – Frame Same as for 15-70 AMPS trip rating.

2.02 FUSES

- A. Fuse holders for distribution equipment and panelboards (except as otherwise specified for service switches) shall be equipped with H.R.C. type cartridge fuses of type and voltage required. All fuses including spares shall have a minimum interrupting rating of 200,000 R.M.S. amperes the equal of Bussman or Gould Shawmut.

1. All Circuits 600A and Below:
 - a. Dual element, time delay, current limiting 600 amp maximum rating at required voltage, and 200,000 amp interrupting rating.
 - b. Similar to type low peak LPN-RK (rating)- SP, 250 volt, 15-600A or low peak LPS-RK (rating) - SP, 600 volt, 15-600A (U.L. Class RK1 with dual element time delay).

2. All fuses shall be the product of the same manufacturer.

3. Spare Fuses

Furnish and deliver the following spare fuses:

- a. One set of three for each service switch.
- b. Three fuses of each type and size for all other fuses.
- c. A minimum 2:1 ratio must be maintained between the ampere rating of a main fuse and that of the feeder fuse, and between the feeder fuse and the branch circuit fuse to obtain selective coordination and allow for minimum fusible switch size.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

HVAC Specifications

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)		
230529	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT	9
23054813	VIBRATION CONTROLS FOR HVAC	9
230553	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT	6
230719	HVAC PIPING INSULATION	12
23092312	CONTROL DAMPERS	11
232300	REFRIGERANT PIPING	12
233113	METAL DUCTS	12
233416	CENTRIFUGAL HVAC FANS	7
23371323	REGISTERS AND GRILLES	3
238126	SPLIT-SYSTEM AIR-CONDITIONERS	7
 END OF TABLE OF CONTENTS		

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC 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. Metal pipe hangers and supports.
 - 2. Trapeze pipe hangers.
 - 3. Fastener systems.
 - 4. Pipe stands.
 - 5. Equipment supports.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
 - 2. Section 230516 "Expansion Fittings and Loops for HVAC Piping" for pipe guides and anchors.
 - 3. Section 230548.13 "Vibration Controls for HVAC" for vibration isolation devices.
 - 4. Section 233113 "Metal Ducts" for duct hangers and supports.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:

- 1. Trapeze pipe hangers.
 - 2. Metal framing systems.
 - 3. Fiberglass strut systems.
 - 4. Pipe stands.
 - 5. Equipment supports.

- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

- 1. Detail fabrication and assembly of trapeze hangers.
 - 2. Include design calculations for designing trapeze hangers.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Structural-Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code, Section IX.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design trapeze pipe hangers and equipment supports.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 - 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
 - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
 - 3. Design seismic-restraint hangers and supports for piping and equipment.

2.2 METAL PIPE HANGERS AND SUPPORTS

- A. Copper Pipe and Tube Hangers:
 - 1. Description: MSS SP-58, Types 1 through 58, copper-plated steel, factory-fabricated components.
 - 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-plated steel.

2.3 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.4 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Hilti, Inc.
 - b. ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - c. MKT Fastening, LLC.
- B. Mechanical-Expansion Anchors: Insert-wedge-type anchors for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Empire Industries, Inc.
 - b. Hilti, Inc.
 - c. MKT Fastening, LLC.
 - 2. Indoor Applications: Zinc-coated or stainless steel.
 - 3. Outdoor Applications: Stainless steel.

2.5 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.6 MATERIALS

- A. Aluminum: ASTM B221.
- B. Carbon Steel: ASTM A1011/A1011M.
- C. Structural Steel: ASTM A36/A36M, carbon-steel plates, shapes, and bars; galvanized.
- D. Stainless Steel: ASTM A240/A240M.
- E. Threaded Rods: Continuously threaded. Zinc-plated or galvanized steel for indoor applications and stainless steel for outdoor applications. Mating nuts and washers of similar materials as rods.
- F. Grout: ASTM C1107/C1107M, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-58. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 2. Field fabricate from ASTM A36/A36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Fastener System Installation:
 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- D. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- E. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- G. Install lateral bracing with pipe hangers and supports to prevent swaying.

- H. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- I. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- J. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- K. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.

3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers.

- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.6 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780/A780M.

3.7 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-58 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and attachments for general service applications.

- F. Use copper-plated pipe hangers and copper or stainless steel attachments for copper piping and tubing.
- G. Use padded hangers for piping that is subject to scratching.
- H. Use thermal-hanger shield inserts for insulated piping and tubing.
- I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - 2. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 - 3. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 - 4. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
- J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
- K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 - 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 - 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 - 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 - 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 - 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 - 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 - 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 - 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 - 6. C-Clamps (MSS Type 23): For structural shapes.
 - 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 - 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.

9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 13. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 14. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- O. Comply with MSS SP-58 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

- P. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 230529

SECTION 230548.13 - VIBRATION CONTROLS FOR HVAC

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. Housed-spring isolators.
 - 2. Restrained-spring isolators.
 - 3. Housed-restrained-spring isolators.
 - 4. Spring hangers.
 - 5. Snubbers.
 - 6. Restraint accessories.
 - 7. Post-installed concrete anchors.
 - 8. Concrete inserts.
 - 9. Vibration isolation equipment bases.
 - 10. Restrained isolation roof-curb rails.

1.3 DEFINITIONS

- A. IBC: International Building Code.
- B. OSHPD: Office of Statewide Health Planning and Development (for the State of California owned and regulated medical facilities).

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 2. Include load rating for each wind-force-restraint fitting and assembly.
 - 3. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device component.
 - 4. Annotate to indicate application of each product submitted and compliance with requirements.
 - 5. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.
- B. Shop Drawings:

1. Detail fabrication and assembly of equipment bases.
2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal:

1. For each wind-load protection device that is required by this Section or is indicated on Drawings, submit the following:
 - a. Vibration Isolator and Wind-Load-Restraint Selection: Select vibration isolators, wind-load restraints, and vibration isolation bases complying with performance requirements, design criteria, and analysis data.
 - b. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, and spring deflection changes. Include certification by professional engineer that riser system was examined for excessive stress and that none exists.
 - c. Concrete Anchors and Inserts: Include calculations showing anticipated wind loads.
 - d. Wind-Load Design Calculations: Submit all static and dynamic loading calculations prepared under "Wind-Load Design Calculations" Paragraph in "Performance Requirements" Article.
 - e. Qualified Professional Engineer: All designated-design submittals for wind-restraint calculations are to be signed and sealed by qualified professional engineer responsible for their preparation.
2. Wind-Restraint Detail Drawing:
 - a. Design Analysis: To support selection and arrangement of wind restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during wind events. Indicate association with vibration isolation devices.
 - c. Coordinate vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply also with requirements in other Sections for equipment mounted outdoors.
3. All delegated-design submittals for wind-restraint detail Drawings are to be signed and sealed by qualified professional engineer responsible for their preparation.
4. Product Listing, Preapproval, and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and basis for approval (tests or calculations).
5. Design Calculations for Vibration Isolation Devices: Calculate static and dynamic loading due to equipment weight and operating forces required to select proper vibration isolators, and to design vibration isolation bases.
6. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, and spring deflection changes. Include certification that riser system was examined for excessive stress and that none exists.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of vibration isolation device installation for HVAC piping and equipment with other systems and equipment in the vicinity, including other supports and restraints.
- B. Qualification Data: For testing agency.
- C. Welding certificates.
- D. Air-Spring Mounting System Performance Certification: Include natural frequency, load, and damping test data.
- E. Field quality-control reports.
- F. Wind-Force Performance Certification: Provide special certification for HVAC components subject to high wind exposure and impact damage and designated on Drawings or in the Specifications to require wind-force performance certification.
 - 1. Provide equipment manufacturer's written certification for each designated HVAC device, stating that it will remain in place and operable following the design wind event and comply with all requirements of authorities having jurisdiction.
 - 2. Provide manufacturer's written certification for each designated louver, damper, or similar device, stating that it will remain in place and protect opening from penetration of windborne debris and comply with all requirements of authorities having jurisdiction.
 - 3. Certification must be based on ICC-ES or similar nationally recognized testing standard procedures acceptable to authorities having jurisdiction.
 - 4. The following HVAC systems and components require special certification for high wind performance. Written special certification of resistance to the effects of high wind force and impact damage must be provided by manufacturer:

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For restrained-air-spring mounts to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct testing indicated, be an NRTL as defined by OSHA in 29 CFR 1910.7 and be acceptable to authorities having jurisdiction.
- B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Wind-Load-Restraint Device Load Ratings: Devices to be tested and rated in accordance with applicable code requirements and authorities having jurisdiction. Devices to be listed by a nationally recognized third party that requires periodic follow-up inspections and has a listing

directory available to the public. Provide third-party listing by one or more of the following:
UL product listing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Consequential Damage: Provide additional restraints for suspended HVAC components or anchorage of floor-, roof-, or wall-mounted HVAC components as indicated in ASCE/SEI 7-05 so that failure of a non-essential or essential HVAC component will not cause the failure of any other essential architectural, mechanical, or electrical building component.
- B. Fire/Smoke Resistance: All components that are not constructed of ferrous metals must have a maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested by an NRTL in accordance with ASTM E84 or UL 723, and be so labeled.
- C. Component Supports:
 - 1. Load ratings, features, and applications of all reinforcement components must be based on testing standards of a nationally recognized testing agency.

2.2 HOUSED-SPRING ISOLATORS

- A. Freestanding, Laterally Stable, Open-Spring Isolators in Two-Part Telescoping Housing:
 - 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 5. Minimum deflection as indicated on Drawings.
 - 6. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators.
 - a. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psi.
 - b. Top housing with attachment and leveling bolt.

2.3 RESTRAINED-SPRING ISOLATORS

- A. Freestanding, Laterally Stable, Open-Spring Isolators with Vertical-Limit Stop Restraint: .
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ace Mountings Co., Inc.

- b. Kinetics Noise Control, Inc.
 - c. Mason Industries, Inc.
- 2. Housing: Steel housing with vertical-limit stops to prevent spring extension due to weight being removed.
 - a. Base with holes for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psi.
 - b. Top plate with threaded mounting holes.
 - c. Internal leveling bolt that acts as blocking during installation.
- 3. Restraint: Limit stop as required for equipment and authorities having jurisdiction.
- 4. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
- 5. Minimum Additional Travel: 50 percent of the required deflection at rated load.
- 6. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
- 7. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
- 8. Minimum deflection as indicated on Drawings.

2.4 PIPE-RISER RESILIENT SUPPORT

- A. All-Directional, Acoustical Pipe Anchor Consisting of Two Steel Tubes Separated by a Minimum 1/2-inch-Thick Neoprene: .
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Kinetics Noise Control, Inc.
 - b. Mason Industries, Inc.
 - c. Vibration Eliminator Co., Inc.
 - 2. Vertical-Limit Stops: Steel and neoprene vertical-limit stops arranged to prevent vertical travel in both directions.
 - 3. Maximum Load Per Support: 500 psi on isolation material providing equal isolation in all directions.
 - 4. Minimum deflection as indicated on Drawings.

2.5 SPRING HANGERS

- A. Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Ace Mountings Co., Inc.

- b. Kinetics Noise Control, Inc.
 - c. Mason Industries, Inc.
- 2. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
 - 3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 6. Minimum deflection as indicated on Drawings.
 - 7. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 8. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
 - 9. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
 - 10. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

2.1 RESTRAINED ISOLATION ROOF-CURB RAILS

- 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. Kinetics Noise Control, Inc.
 - 2. Thybar Corporation.
 - 3. Vibration Management Corp.
- B. Description: Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment.
- C. Upper Frame: Shall provide continuous and captive support for equipment.
- D. Lower Support Assembly: Shall be formed sheet metal section containing adjustable and removable steel springs that support upper frame. Lower support assembly shall have a means for attaching to building structure and a wood nailer for attaching roof materials and shall be insulated with a minimum of 2 inches of rigid glass-fiber insulation on inside of assembly.
 - 1. Adjustable, restrained-spring isolators shall be mounted on elastomeric vibration isolation pads and shall have access ports, for level adjustment, with removable waterproof covers at all isolator locations. Isolators shall be located so they are accessible for adjustment at any time during the life of the installation without interfering with integrity of roof.
 - 2. Minimum deflection as indicated on Drawings.
- E. Water Seal: Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counterflashed over roof materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to wind-load forces.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength is adequate to carry static and wind force loads within specified loading limits.

3.3 INSTALLATION OF VIBRATION CONTROL DEVICES

- A. Provide vibration control devices for systems and equipment where indicated in Equipment Schedules or Vibration-Control Device Schedules on Drawings, where Specifications indicate they are to be installed on specific equipment and systems, and where required by applicable codes.
- B. Coordinate location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 033000 "Cast-in-Place Concrete."
- C. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- D. Comply with requirements in Section 077200 "Roof Accessories" for installation of roof curbs, equipment supports, and roof penetrations.
- E. Equipment Restraints:
 - 1. Install snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
- F. Piping Restraints:

1. Comply with requirements in MSS SP-127.
 1. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
 2. Brace a change of direction longer than 12 feet.
- G. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- H. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- I. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- J. Post-Installed Concrete Anchors:
1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 3. Wedge-Type Anchor Bolts: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 4. Adhesive-Type Anchor Bolts: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 6. Install zinc-coated steel anchors for interior and stainless steel anchors for exterior applications.

3.4 INSTALLATION OF VIBRATION ISOLATION EQUIPMENT BASES

- A. Coordinate location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate dimensions of equipment bases with requirements of isolated equipment specified in this and other Sections. Where dimensions of base are indicated on Drawings, they may require adjustment to accommodate isolated equipment.

3.5 ADJUSTING

- A. Adjust isolators after system is at operating weight.

- B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Tests and Inspections:
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
 - 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 - 4. Test at least two of each type and size of installed anchors and fasteners selected by Architect.
 - 5. Test to 90 percent of rated proof load of device.
 - 6. Measure isolator restraint clearance.
 - 7. Measure isolator deflection.
 - 8. Verify snubber minimum clearances.
 - 9. Test and adjust restrained-air-spring isolator controls and safeties.
- E. Remove and replace malfunctioning units and retest as specified above.
- F. Prepare test and inspection reports.

END OF SECTION 230548.13

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Warning tape.
4. Pipe labels.
5. Duct labels.
6. Stencils.
7. Valve tags.
8. Warning tags.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- 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: Provide for each piping system. Include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Material and Thickness: stainless steel, 0.025-inch minimum thickness, with predrilled or stamped holes for attachment hardware.
2. Letter and Background Color: As indicated for specific application under Part 3.
3. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
4. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

5. Fasteners: Stainless steel rivets or self-tapping screws.
 6. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
 2. Letter and Background Color: As indicated for specific application under Part 3.
 3. Maximum Temperature: Able to withstand temperatures of up to 160 deg F.
 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: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 6. Fasteners: Stainless steel rivets or self-tapping screws.
 7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
- B. Letter and Background Color: As indicated for specific application under Part 3.
- C. Maximum Temperature: Able to withstand temperatures of up to 160 deg F.
- 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: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- F. Fasteners: Stainless steel rivets or self-taping screws.
- G. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- H. Arc-Flash Warning Signs: Provide arc-flash warning signs in locations and with content in accordance with requirements of OSHA and NFPA70E and other applicable codes and standards.
- I. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 WARNING TAPE

- 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. Brady Corporation.
 - 2. National Marker Company.
 - 3. Seton Identification Products; a Brady Corporation company.
- B. Material: Vinyl.
- C. Minimum Thickness: 0.005 inch.
- D. Letter, Pattern, and Background Color: As indicated for specific application under Part 3.
- E. Waterproof Adhesive Backing: Suitable for indoor or outdoor use.
- F. Maximum Temperature: 160 deg F.
- G. Minimum Width: 2 inches.

2.4 PIPE LABELS

- 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. Brady Corporation.
 - 2. Seton Identification Products; a Brady Corporation company.
 - 3. emedco.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color coded, with lettering indicating service and showing flow direction in accordance with ASME A13.1.
- C. Letter and Background Color: As indicated for specific application under Part 3.
- D. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- E. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- F. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings. Also include:
 - 1. Pipe size.
 - 2. Flow-Direction Arrows: Include flow-direction arrows on distribution piping. Arrows may be either integral with label or applied separately.
 - 3. Lettering Size: Size letters in accordance with ASME A13.1 for piping.

2.5 VALVE TAGS

- 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. Brady Corporation.
 - 2. Seton Identification Products; a Brady Corporation company.
 - 3. emedco.
- B. Description: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 - 1. Tag Material: Brass, 0.04-inch minimum thickness, with predrilled or stamped holes for attachment hardware.
 - 2. Fasteners: Brass wire.
- C. Letter and Background Color: As indicated for specific application under Part 3.
- D. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 - 1. Include valve-tag schedule in operation and maintenance data.

2.6 WARNING TAGS

- 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. Brady Corporation.
 - 2. Marking Services Inc.
 - 3. Seton Identification Products; a Brady Corporation company.
- B. Description: Preprinted accident-prevention tags of plasticized card stock.
 - 1. Size: 3 by 5-1/4 inches minimum.
 - 2. Fasteners: Brass grommet and wire.
 - 3. Nomenclature: Large-size primary caption, such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 - 4. Letter and Background Color: As indicated for specific application under Part 3.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

3.2 INSTALLATION, GENERAL 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.
- D. Locate identifying devices so that they are readily visible from the point of normal approach.

3.3 INSTALLATION OF EQUIPMENT LABELS, WARNING SIGNS, AND LABELS

- A. Permanently fasten labels on each item of mechanical equipment.
- B. Sign and Label Colors:
 - 1. White letters on an ANSI Z535.1 safety-blue background.
- C. Locate equipment labels where accessible and visible.
- D. Arc-Flash Warning Signs: Provide arc-flash warning signs on electrical disconnects and other equipment where arc-flash hazard exists, as indicated on Drawings, and in accordance with requirements of OSHA and NFPA 70E.

3.4 INSTALLATION OF WARNING TAPE

- A. Warning Tape Color and Pattern: Yellow background with black diagonal stripes.
- B. Install warning tape on pipes and ducts, with cross-designated walkways providing less than 6 ft. of clearance.
- C. Locate tape so as to be readily visible from the point of normal approach.

3.5 INSTALLATION OF PIPE LABELS

- A. Install pipe labels showing service and flow direction with permanent adhesive on pipes.
- 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. Within 3 ft. of each valve and control device.
 - 2. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 3. Within 3 ft. of equipment items and other points of origination and termination.
 - 4. Spaced at maximum intervals of 25 ft. along each run. Reduce intervals to 10 ft. in areas of congested piping, ductwork, and equipment.

- C. Do not apply plastic pipe labels or plastic tapes directly to bare pipes conveying fluids at temperatures of 125 deg F or higher. Where these pipes are to remain uninsulated, use a short section of insulation or use stenciled labels.
- D. Flow-Direction Arrows: Use arrows to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- E. Pipe-Label Color Schedule:
 - 1. Refrigerant Piping: White letters on an ANSI Z535.1 safety-blue background.
 - 2. Compressed Air: White letters on an ANSI Z535.1 safety-blue background.

3.6 INSTALLATION OF VALVE TAGS

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule in the operating and maintenance manual.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in "Valve-Tag Size and Shape" Subparagraph below.
 - 1. Valve-Tag Size and Shape:
 - a. Refrigerant: 1-1/2 inches , round.
 - 2. Valve-Tag Colors:
 - a. For each piping system, use the same lettering and background coloring system on valve tags as used for the Pipe Label Schedule text and background.

3.7 INSTALLATION OF WARNING TAGS

- A. Warning Tag Color: Black letters on an ANSI Z535.1 safety-yellow background.
- B. Attach warning tags, with proper message, to equipment and other items where scheduled.

END OF SECTION 230553

SECTION 230719 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes insulation for HVAC piping systems.
- B. Related Requirements:
 - 1. Section 230713 "Duct Insulation" for duct insulation.
 - 2. Section 230716 "HVAC Equipment Insulation" for equipment insulation.
 - 3. Section 232113.13 "Underground Hydronic Piping" loose-fill pipe insulation in underground piping outside the building.
 - 4. Section 232213.13 "Underground Steam and Condensate Heating Piping" for steam and condensate piping for steam-type tank heaters.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied, if any).
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail attachment and covering of heat tracing inside insulation.
 - 3. Detail insulation application at pipe expansion joints for each type of insulation.
 - 4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 5. Detail removable insulation at piping specialties.
 - 6. Detail application of field-applied jackets.
 - 7. Detail application at linkages of control devices.
- C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use.
 - 1. Preformed Pipe Insulation Materials: 12 inches long by NPS 2.
 - 2. Sheet Form Insulation Materials: 12 inches square.
 - 3. Jacket Materials for Pipe: 12 inches long by NPS 2.
 - 4. Sheet Jacket Materials: 12 inches square.
 - 5. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or craft training program.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation system materials are to be delivered to the Project site in unopened containers. The packaging is to include name of manufacturer, fabricator, type, description, and size.

1.6 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.7 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84 by a testing agency acceptable to authority having jurisdiction. Factory label insulation, jacket materials, adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.

1. All Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

2.2 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials are applied.
- B. Products do not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come into contact with stainless steel have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.
- D. Insulation materials for use on austenitic stainless steel are qualified as acceptable in accordance with ASTM C795.
- E. Foam insulation materials do not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Comply with ASTM C552.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Owens Corning.
 2. Preformed Pipe Insulation without Jacket: Type II, Class 1, unfaced.
 3. Preformed Pipe Insulation with Jacket: Type II, Class 2, with factory-applied ASJ jacket.
 4. Fabricated shapes in accordance with ASTM C450, ASTM C585, and ASTM C1639.
 5. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- G. Flexible Elastomeric: Closed-cell, or expanded-rubber materials; suitable for maximum use temperature between minus 70 deg F and 220 deg F. Comply with ASTM C534/C534M, Type I, for tubular materials, Type II for sheet materials.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Aeroflex USA.
 - b. Armacell LLC.
 - c. K-Flex USA.
- H. Glass-Fiber, Preformed Pipe: Glass fibers bonded with a thermosetting resin; suitable for maximum use temperature up to 850 deg F in accordance with ASTM C411. Comply with ASTM C547.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Knauf Insulation.
 - c. Owens Corning.
2. Preformed Pipe Insulation: Type I, Grade A with factory-applied ASJ.
3. Fabricated shapes in accordance with ASTM C450 and ASTM C585.
4. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.3 SEALANTS

- A. Materials are as recommended by the insulation manufacturer and are compatible with insulation materials, jackets, and substrates.
- B. Joint Sealants:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller.
 - c. Owens Corning.
 2. Permanently flexible, elastomeric sealant.
 - a. Service Temperature Range: [Minus 150 to plus 250 deg F] [Minus 100 to plus 300 deg F].
 - b. Color: White or gray.

2.4 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.
 4. ASJ+: Aluminum foil reinforced with glass scrim bonded to a kraft paper interleaving with an outer film leaving no paper exposed; complying with ASTM C1136, Types I, II, III, IV, and VII.
 5. PSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C1136, Type II.

2.5 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Knauf Insulation.
 - 2. Width: 3 inches.
 - 3. Thickness: 11.5 mils.
 - 4. Adhesion: 90 ounces force/inch in width.
 - 5. Elongation: 2 percent.
 - 6. Tensile Strength: 40 lbf/inch in width.
 - 7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.
 - 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
 - 1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
 - 2. Carbon Steel: Coat carbon steel operating at a service temperature of between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

- C. Coordinate insulation installation with the tradesman installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, compress, or otherwise damage insulation or jacket.
- D. Install insulation with longitudinal seams at top and bottom (12 o'clock and 6 o'clock positions) of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during storage, application, and finishing. Replace insulation materials that get wet during storage or in the installation process before being properly covered and sealed in accordance with the Contract Documents.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends attached to structure with vapor-barrier mastic.
 - 3. Install insert materials and insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth, but not to the extent of creating wrinkles or areas of compression in the insulation.
 2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches o.c.
 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at **[2 inches] [4 inches]** o.c.
 4. For below-ambient services, apply vapor-barrier mastic over staples.
 5. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
 6. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.
- P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
 2. Testing agency labels and stamps.
 3. Nameplates and data plates.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.

2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles below.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using prefabricated fitting insulation made from same material and density as that of adjacent pipe insulation. Each piece is butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 3. Insulate tee fittings with prefabricated fitting insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using prefabricated fitting insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands, and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with jackets on above-ambient services, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install prefabricated pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as that of pipe insulation. Where voids are difficult to fill with block insulation, fill the voids with a fibrous insulation material suitable for the specific operating temperature.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered or routed sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install prefabricated sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.

2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as that of pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install sections of pipe insulation and miter if required in accordance with manufacturer's written instructions.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install prefabricated valve covers manufactured of same material as that of pipe insulation when available.
2. When prefabricated valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 INSTALLATION OF GLASS-FIBER AND MINERAL WOOL INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands, and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install prefabricated pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with glass-fiber or mineral-wool blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available.
2. When prefabricated sections are not available, install fabricated sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.9 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections.
- B. Engage a qualified testing agency to perform tests and inspections.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- D. Perform tests and inspections.
- E. All insulation applications will be considered defective if they do not pass tests and inspections.
- F. Prepare test and inspection reports.

3.10 PIPING INSULATION SCHEDULE, GENERAL

- A. Insulation conductivity and thickness per pipe size comply with schedules in this Section or with requirements of authorities having jurisdiction, whichever is more stringent.
- B. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- C. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 1. Underground piping.
 2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.11 INDOOR PIPING INSULATION SCHEDULE

- A. Condensate and Equipment Drain Water below 60 Deg F:
 - 1. All Pipe Sizes: Insulation is one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 3/4 inch thick.
 - c. Glass-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
- B. Refrigerant Suction and Hot-Gas Piping:
 - 1. All Pipe Sizes: Insulation is one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Glass-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
- C. Refrigerant Suction and Hot-Gas Flexible Tubing:
 - 1. All Pipe Sizes: Insulation is one of the following:
 - a. Flexible Elastomeric: 2 inches thick.
- D. Refrigerant Liquid Piping:
 - 1. All Pipe Sizes: Insulation is one of the following:
 - a. Cellular Glass: 1-1/2 inches thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Glass-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

END OF SECTION 230719

SECTION 230923.12 - CONTROL DAMPERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rectangular control dampers with airfoil blades.
2. Rectangular control dampers with flat blades.
3. Electric and electronic control-damper actuators.

1.2 DEFINITIONS

- A. DDC: Direct digital control.
- B. RMS: Root-mean-square value of alternating voltage, which is the square root of the mean value of the square of the voltage values during a complete cycle.
- C. Thermal Efficiency Ratio (E): Comparison of a tested damper's thermal performance against a v-groove blade reference damper. A damper with the same thermal efficiency as the reference damper would have an E value of 0 percent, while a damper that is 4 times as efficient would have an E value of 200 percent.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Rectangular control dampers with airfoil blades.
2. Rectangular control dampers with flat blades.
3. Electric and electronic control-damper actuators.

B. Product Data Submittals: For each damper and actuator.

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, electrical characteristics, and furnished accessories indicating process operating range, accuracy over range, control signal over range, default control signal with loss of power, calibration data specific to each unique application, electrical power requirements, and limitations of ambient operating environment, including temperature and humidity.
3. Product description with complete technical data, performance curves, and product specification sheets.
4. Installation instructions, including factors affecting performance.

C. Shop Drawings:

1. Include plans, elevations, sections, and details.
2. Include details of product 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.
4. Include diagrams for pneumatic signal and main air tubing.

D. Delegated Design Submittals:

1. Schedule and design calculations for control dampers and actuators, including the following:
 - a. Unique designation for each damper/actuator assembly.
 - b. Service/application.
 - c. Damper assembly size.
 - d. Damper assembly weight, including actuator(s).
 - e. Damper and actuator action (modulating or two position).
 - f. Flow at project design and minimum flow conditions.
 - g. Face velocity at project design and minimum airflow conditions.
 - h. Pressure drop across damper at project design and minimum airflow conditions.
 - i. AMCA 500D damper installation arrangement used to calculate and schedule pressure drop, as applicable to installation.
 - j. Maximum close-off pressure.
 - k. Leakage airflow at maximum system pressure differential (fan close-off pressure).
 - l. Damper torque required at worst-case condition for sizing actuator.
 - m. Actuator selection indicating torque provided.
 - n. Actuator fail-safe position on loss of power and loss of signal.
 - o. Remarks listing special requirements.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plan drawings and corresponding product installation details, drawn to scale, on which the following items are indicated and coordinated with each other, using input from installers of the items involved:
1. Product installation location indicated in relationship to room, duct, and equipment.
 2. Size and location of wall access panels for control dampers and actuators installed behind walls.
 3. Size and location of ceiling access panels for control dampers and actuators installed above inaccessible ceilings.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For control dampers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE 62.1 Compliance: Applicable outdoor ventilation requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- C. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- D. Code Compliance: Comply with governing energy code.
- E. Delegated Design: Engage a qualified professional, as defined in Section 014000 "Quality Requirements," to size products where indicated as delegated design.
- F. Ground Fault: Properly ground products to prevent failing due to ground fault conditions.
- G. Backup Power Source: Serve control-damper actuators from a backup power source where associated with systems and equipment served by a backup power source.
- H. Environmental Conditions: For actuators not available with integral enclosures complying with requirements indicated, house in protective secondary enclosures complying with requirements.
- I. Selection Criteria:
 - 1. Multi-Blade Damper Configuration: As follows unless otherwise indicated on Drawings:
 - a. Two-Position Control: Opposed or parallel.
 - b. All Other Applications: Opposed or parallel.
 - 2. Fail-Safe Positions: As follows unless otherwise indicated on Drawings:
 - a. Exhaust Air: Open.
 - 3. Select dampers with smooth and stable operation throughout full range of operation over varying pressures and temperatures encountered.
 - 4. Sizing: As follows unless otherwise indicated on Drawings
 - a. Two-Position Dampers: Full size of duct or equipment connection unless otherwise indicated.

2.2 RECTANGULAR CONTROL DAMPERS WITH AIRFOIL BLADES

- A. General Requirements:
 - 1. Factory assemble multiple damper sections to provide a single damper assembly of size required by the application.

- a. Include multisection damper assemblies with intermediate reinforcing where required between individual sections being joined together. Construct reinforcing of same material (aluminum, galvanized steel, stainless steel) as damper frame.
2. Factory install actuator(s) as integral part of damper assembly. Coordinate, with damper manufacturer, field requirements for actuators, such as type, fail-safe position, power supply, location, and mounting requirements.

B. Rectangular Control Dampers with Aluminum Airfoil Blades and Frames:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Greenheck Fan Corporation.
 - b. Johnson Controls, Inc.
 - c. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.
2. Source Limitations: Obtain rectangular control dampers, with aluminum airfoil blades and frames, from single manufacturer.
3. AMCA Certification: Test, rate, and seal, in accordance with AMCA 511 for air performance and air leakage.
4. Construction:
 - a. Frame:
 - 1) Material: ASTM B211/B211M, Alloy 6063 T5 extruded-aluminum profiles, minimum 0.125 inch thick.
 - 2) Arrangement: Hat-shaped channel with integral extended face flange(s) having mating face of minimum 1 inch for attachment to duct flanges, plenum walls, and equipment.
 - 3) Width: Not less than 5 inches.
 - b. Blades:
 - 1) Configuration: Parallel or opposed blade configuration as required by application.
 - 2) Material: ASTM B211/B211M, Alloy 6063 T5 extruded-aluminum profiles, 0.07 inch thick.
 - 3) Shape: Hollow, airfoil.
 - 4) Length: As required by close-off pressure rating, not to exceed 48 inches.
 - 5) Width: Not to exceed 6 inches.
 - c. Seals:
 - 1) Blades: Replaceable; extruded Santoprene, silicone, or damper manufacturer-offered equivalent, as required by performance requirements. Seals are mechanically attached in extruded blade slots.
 - 2) Jambs: Replaceable; stainless steel, compression type.
 - d. Axles:

- 1) Diameter: Minimum 0.375 inch.
 - 2) Material: Aluminum,.
 - 3) Mechanically attached to blades.
- e. Bearings:
- 1) Material: Molded acetal or stainless steel sleeve, as required by operating conditions, mounted in frame.
 - 2) Where blade axles are installed in vertical position, provide thrust bearings.
- f. Linkage:
- 1) Hardware: Plated or stainless steel.
 - 2) Material: Aluminum, or stainless steel.
 - 3) Mounting: Concealed in frame.
- g. Additional Corrosion Protection for Corrosive Environments:
- 1) Provide anodized finish, minimum of 0.0007 inch thick, for aluminum surfaces in contact with airstream.
 - 2) Paint surfaces exposed to airstream with an **[enamel]** [or] **[epoxy]** **<Insert finish>** finish. Prepare surfaces to be painted according to paint manufacturer's instructions.
 - 3) Construct axles, damper linkage, and hardware of Type 316L stainless steel.

2.3 GENERAL CONTROL-DAMPER ACTUATORS REQUIREMENTS

- A. Select actuators to operate related damper(s) with sufficient reserve power to provide smooth modulating action or two-position action and proper speed of response at velocity and pressure conditions to which the damper is subjected.
- B. Select actuators with sufficient power and torque to close off against the maximum system pressures encountered. Actuators are to be sized to close off against the fan shutoff pressure as a minimum requirement.
- C. The total damper area operated by an actuator is not to exceed 80 percent of manufacturer's maximum area rating.
- D. Provide one actuator for each damper assembly where possible. Operate multiple actuators required to drive a single damper assembly in unison.
- E. Avoid the use of excessively oversized actuators, which could overdrive and cause linkage failure when the damper blade has reached either its full open or closed position.
- F. Use jackshafts and shaft couplings in lieu of blade-to-blade linkages when driving axially aligned damper sections.
- G. Provide mounting hardware and linkages for connecting actuator to damper.
- H. Select actuators to fail-safe in desired position in the event of a power failure.

I. Actuator Fail-Safe Positions: As indicated below:

1. Exhaust Air: Open.
2. Outdoor Air: Close.

2.4 ELECTRIC AND ELECTRONIC CONTROL-DAMPER ACTUATORS

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. Belimo Aircontrols (USA), Inc.
2. Honeywell Building Solutions; Honeywell International, Inc.
3. Johnson Controls, Inc.
4. Siemens Industry, Inc., Building Technologies Division.

B. Source Limitations: Obtain electric and electronic control-damper actuators from single manufacturer.

C. Type: Motor operated, with or without gears, electric and electronic.

D. Voltage:

1. Voltage selection is delegated to professional designing control system.
2. Actuator to deliver torque required for continuous uniform movement of controlled device from limit to limit when operated at rated voltage.
3. Actuator to function properly within a range of 85 to 120 percent of nameplate voltage.

E. Construction:

1. Less Than 100 W: Fiber or reinforced nylon gears with steel shaft, copper alloy or nylon bearings, and pressed-steel enclosures.
2. 100 up to 400 W: Gears ground steel, oil immersed, shaft-hardened steel running in bronze, copper alloy, or ball bearings. Operator and gear trains are to be totally enclosed in dustproof cast-iron, cast-steel, or cast-aluminum housing.
3. Greater Than 400 W: Totally enclosed reversible induction motors with auxiliary hand crank and permanently lubricated bearings.

F. Local Field Adjustment: Make spring-return actuators easily switchable from fail-safe open to fail-safe closed in the field without replacement.

G. Local Manual Override: Provide gear-type actuators with an external manual adjustment mechanism to allow manual positioning of the damper when the actuator is not powered.

H. Two-Position Actuators: Single direction, spring return or reversing type.

I. Modulating Actuators:

1. Capable of stopping at all points across full range, and starting in either direction from any point in range.
2. Control Input Signal:

- a. Three Point, Tristate, or Floating Point: Clockwise and counter-clockwise inputs. One input drives actuator to open position, and other input drives actuator to close position. No signal of either input remains in last position.
- b. Proportional: Actuator drives proportional to input signal and modulates throughout its angle of rotation. Suitable for 0 to 10 or 2 to 10 V dc and 4 to 20 mA signals.
- c. Pulse Width Modulation (PWM): Actuator drives to a specified position according to a pulse duration (length) of signal from a dry-contact closure, triac sink, or source controller.
- d. Programmable Multifunction:
 - 1) Control input, position feedback, and running time are to be factory or field programmable.
 - 2) Diagnostic feedback of hunting or oscillation, mechanical overload, mechanical travel, and mechanical load limit.
 - 3) Service data, including at a minimum, number of hours powered and number of hours in motion.

J. Position Feedback:

1. Equip two-position actuators with limit switches or other positive means of a position indication signal for remote monitoring of open and close position.
2. Equip Where indicated, equip modulating actuators with a position feedback through current or voltage signal for remote monitoring.
3. Provide a position indicator and graduated scale on each actuator indicating open and closed travel limits.

K. Fail-Safe:

1. Where indicated, provide actuator to fail-safe to an end position.
2. Internal spring-return mechanism to drive controlled device to an end position (open or close) on loss of power.
3. Batteries, capacitors, and other nonmechanical forms of fail-safe operation are acceptable only where uniquely indicated.

L. Integral Overload Protection:

1. Provide against overload throughout the entire operating range in both directions.
2. Electronic overload, digital rotation sensing circuitry, mechanical end switches, or magnetic clutches are acceptable methods of protection.

M. Damper Attachment:

1. Unless otherwise required for damper interface, provide actuator designed to be directly coupled to damper shaft without need for connecting linkages.
2. Attach actuator to damper drive shaft in a way that ensures maximum transfer of power and torque without slippage.
3. Bolt and setscrew method of attachment is acceptable only if provided with at least two points of attachment.

N. Temperature and Humidity:

1. Temperature: Suitable for operating temperature range encountered by application with minimum operating temperature range of minus 20 to plus 120 deg F.
 2. Humidity: Suitable for humidity range encountered by application; minimum operating range is to be from 5 to 95 percent relative humidity, noncondensing.
- O. Enclosure:
1. Suitable for ambient conditions encountered by application.
- P. Stroke Time:
1. Select operating stroke time to be compatible with equipment and system operation[, **and as follows**].
 - a. Operate damper from fully closed to fully open position within 15 seconds.
 - b. Operate damper from fully open to fully closed position within 15 seconds.
 - c. Move damper to fail-safe position within 15 seconds.
- Q. Sound: Where actuators are located in tenant-occupied rooms with a room sound-level criteria of NC-35 or lower, comply with the following sound levels:
1. Spring Return: 45 dBA.
 2. Nonspring Return: 45 dBA.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for dampers and instruments installed in duct systems to verify actual locations of connections before installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONTROL-DAMPER APPLICATIONS

- A. Select from damper types indicated to achieve performance requirements and characteristics indicated while subjected to full range of system operation encountered.
- B. Rectangular Control-Damper Applications:
 1. Exhaust Air: Rectangular dampers with aluminum airfoil blades;
 2. Outdoor Air: Rectangular dampers with aluminum airfoil blades;

3.3 INSTALLATION, GENERAL

- A. Furnish and install products required to satisfy most stringent requirements indicated.
- B. Properly support dampers and actuators, tubing, wiring, and conduit to comply with requirements indicated. Brace all products to prevent lateral movement and sway or a break in attachment when subjected to a seismic, wind, or others forces common to the application.
- C. Provide ceiling, floor, roof, and wall openings required by installation. Before proceeding with drilling, punching, or cutting, check location first for concealed products that could potentially be damaged. Patch, flash, grout, seal, and refinish openings to match adjacent condition.
- D. Seal penetrations made in fire-rated and acoustically rated assemblies.
- E. Fastening Hardware:
 - 1. Wrenches, pliers, or other tools that will cause injury to or mar surfaces of rods, nuts, and other parts are prohibited for assembling and tightening nuts.
 - 2. Tighten bolts and nuts firmly and uniformly. Do not overstress threads by excessive force or by oversized wrenches.
 - 3. Lubricate threads of bolts, nuts, and screws with graphite and oil before assembly.
- F. Install products in locations that are accessible and that will permit calibration and maintenance from floor, equipment platforms, or catwalks. Where ladders are required for Owner's access, confirm unrestricted ladder placement is possible under occupied condition.

3.4 CONTROL DAMPERS

- A. Install smooth transitions, not exceeding 15 degrees, to dampers larger or smaller than adjacent duct. Install transitions as close to damper as possible but at distance to avoid interference and impact to performance. Consult manufacturer for recommended clearance.
- B. Clearance:
 - 1. Locate dampers for easy access and provide separate support of dampers that cannot be handled by service personnel without hoisting mechanism.
 - 2. Install dampers with at least 24 inches of clear space on sides of dampers requiring service access unless more space is recommended by manufacturer. Provide code required clearances as applicable.
- C. Service Access:
 - 1. Install dampers and actuators to be accessible for visual inspection and service.
 - 2. Install access door(s) in duct or equipment located upstream of damper to allow service personnel to hand clean any portion of damper, linkage, and actuator. Comply with requirements in Section 233300 "Air Duct Accessories."
- D. Install dampers straight and true, level in all planes, and square in all dimensions.
- E. Install supplementary structural reinforcement for large multiple-section dampers if factory-furnished support alone cannot handle loading.

- F. Attach field-installed actuator(s) to damper drive shaft.
- G. For duct-mounted and equipment-mounted dampers installed outside of equipment, install a visible and accessible indication of damper position from outside.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Each piece of wire, cable, and tubing is to have the same designation at each end for operators to determine continuity at points of connection. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install engraved phenolic nameplate with damper identification on damper.

3.6 ELECTRICAL CONNECTIONS

- A. Install electrical power to field-mounted control devices requiring electrical power.
- B. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260523 "Control-Voltage Electrical Power Cables."
- C. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Furnish and install raceways. Comply with requirements in Section 260533.13 "Conduits for Electrical Systems."
- E. Furnish and install circuit breakers. Comply with requirements in Section 262816 "Enclosed Switches and Circuit Breakers."
- F. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.
- G. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
 - 1. Nameplate to be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least 1/2 inch high.

3.7 CONTROL CONNECTIONS

- A. Install control signal wiring to field-mounted control devices.
- B. Furnish and install raceways. Comply with requirements in Section 260533.13 "Conduits for Electrical Systems."

3.8 CLEANING

- A. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from exposed surfaces.

3.9 STARTUP

- A. Control-Damper Checkout:
 - 1. Check installed products before continuity tests, leak tests, and calibration.
 - 2. Check dampers for proper location and accessibility.
 - 3. Verify that control dampers are installed correctly for flow direction.
 - 4. Verify that proper blade alignment, either parallel or opposed, has been provided.
 - 5. Verify that damper frame attachment is properly secured and sealed.
 - 6. Verify that damper actuator and damper linkage attachment are secure.
 - 7. Verify that actuator wiring is complete, enclosed, and connected to correct power source.
 - 8. Verify that damper blade travel is smooth and unobstructed throughout operating range.

3.10 ADJUSTMENT, CALIBRATION, AND TESTING

- A. Stroke and adjust control dampers following manufacturer's recommended procedure, from 100 percent open to 100 percent closed back to 100 percent open.
- B. Stroke control dampers with pilot positioners. Adjust damper and positioner following manufacturer's recommended procedure, so damper is 100 percent closed, 50 percent closed, and 100 percent open at proper air pressure.
- C. Check and document open and close cycle times for applications with a cycle time of less than 30 seconds.
- D. For control dampers equipped with positive position indication, check feedback signal at multiple positions to confirm proper position indication.

END OF SECTION 230923.12

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper tube and fittings.
2. Valves and specialties.
3. Refrigerants.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Solenoid valves.
2. Thermostatic expansion valves.
3. Hot-gas bypass valves.
4. Strainers.
5. Filter dryers.
6. Pressure-regulating valves.
7. Mufflers.

B. Product Data Submittals: For each product.

1. Submit data for each type of refrigerant piping, fitting, valve, piping specialty, and refrigerant.

C. Shop Drawings:

1. Show piping size and piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
2. Show interface and spatial relationships between piping and equipment.
3. Shop Drawing Scale: 1/4 inch equals 1 foot.

1.3 INFORMATIONAL SUBMITTALS

A. Welding Certificates: For each welder performing shop or field welding on Project.

B. Field Quality-Control Reports: For each field quality control test and inspection.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding, Brazing, and Fusing Qualifications."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store piping with end caps in place to ensure that piping interior and exterior are clean when installed.
- B. Prepare valves and specialties for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads and other end connections.
- C. Use the following precautions during storage:
 - 1. Maintain valve and specialty end protection.
 - 2. Store valves and specialties indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," for refrigerant piping size and layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
- B. Comply with ASHRAE 15.
- C. Comply with ASME B31.5.
- D. Test Pressure for Refrigerant R-410A:
 - 1. Suction Tubing for Refrigeration and Air-Conditioning Applications Other than Heat Pumps: 300 psig.
 - 2. Suction Tubing for Heat-Pump Applications: 535 psig.
 - 3. Hot-Gas and Tubing Lines: 535 psig.

2.2 COPPER TUBE AND FITTINGS

- A. Copper Tube: ASTM B88, Type K or L.
- B. Wrought-Copper Fittings, Solder Joint: ASME B16.22.
- C. Wrought-Copper Fittings, Brazed Joint: ASME B16.50.
- D. Wrought-Copper Unions: ASME B16.22.
- E. Solder Filler Metals: ASTM B32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.
- F. Brazing Filler Metals: AWS A5.8M/A5.8.
- G. Flexible Connectors:
 - 1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
 - 2. End Connections: Socket ends.
 - 3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch-long assembly.
 - 4. Working Pressure Rating: Factory test at minimum 500 psig.
 - 5. Maximum Operating Temperature: 250 deg F.

2.3 VALVES AND SPECIALTIES

- A. Diaphragm Packless Valves:
 - 1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
 - 2. Diaphragm: Phosphor bronze and stainless steel with stainless steel spring.
 - 3. Operator: Rising stem and hand wheel.
 - 4. Seat: Nylon.
 - 5. End Connections: Socket, union, or flanged.
 - 6. Working Pressure Rating: 500 psig.
 - 7. Maximum Operating Temperature: 240 deg F.
- B. Packed-Angle Valves:
 - 1. Body and Bonnet: Forged brass or cast bronze.
 - 2. Packing: Molded stem, back seating, and replaceable under pressure.
 - 3. Operator: Rising stem.
 - 4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
 - 5. Seal Cap: Forged-brass or valox hex cap.
 - 6. End Connections: Socket, union, threaded, or flanged.
 - 7. Working Pressure Rating: 500 psig.
 - 8. Maximum Operating Temperature: 275 deg F.
- C. Check Valves:
 - 1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
 - 2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.

3. Piston: Removable polytetrafluoroethylene seat.
 4. Closing Spring: Stainless steel.
 5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
 6. End Connections: Socket, union, threaded, or flanged.
 7. Maximum Opening Pressure: 0.50 psig.
 8. Working Pressure Rating: 500 psig.
 9. Maximum Operating Temperature: 275 deg F.
- D. Service Valves:
1. Body: Forged brass with brass cap, including key end to remove core.
 2. Core: Removable ball-type check valve with stainless steel spring.
 3. Seat: Polytetrafluoroethylene.
 4. End Connections: Copper spring.
 5. Working Pressure Rating: 500 psig.
 6. Maximum Operating Temperature: 275 deg F.
- E. Refrigerant Locking Caps:
1. Description: Locking-type, tamper-resistant, threaded caps to protect refrigerant-charging ports from unauthorized refrigerant access and leakage.
 2. Material: Brass, with protective shroud or sleeve.
 3. Refrigerant Identification: Color-coded, refrigerant specific based on AHRI Guideline N or Universal design.
 4. Special Tool: For installing and unlocking.
- F. Solenoid Valves: Comply with AHRI 760 I-P and UL 429; listed and labeled by an NRTL.
1. Body and Bonnet: Plated steel.
 2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
 3. Seat: Polytetrafluoroethylene.
 4. End Connections: Threaded.
 5. Working Pressure Rating: 400 psig.
 6. Maximum Operating Temperature: 240 deg F.
- G. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
 2. Piston, Closing Spring, and Seat Insert: Stainless steel.
 3. Seat: Polytetrafluoroethylene.
 4. End Connections: Threaded.
 5. Working Pressure Rating: 400 psig.
 6. Maximum Operating Temperature: 240 deg F.
- H. Thermostatic Expansion Valves: Comply with AHRI 750 I-P.
1. Body, Bonnet, and Seal Cap: Forged brass or steel.
 2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
 3. Packing and Gaskets: Non-asbestos.
 4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
 5. Suction Temperature: 40 deg F.
 6. Superheat: Adjustable.
 7. Reverse-flow option (for heat-pump applications).
 8. End Connections: Socket, flare, or threaded union.
 9. Working Pressure Rating: 700 psig.

- I. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.
 - 1. Body, Bonnet, and Seal Cap: Ductile iron or steel.
 - 2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
 - 3. Packing and Gaskets: Non-asbestos.
 - 4. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
 - 5. Seat: Polytetrafluoroethylene.
 - 6. Equalizer: Internal.
 - 7. End Connections: Socket.
 - 8. Throttling Range: Maximum 5 psig.
 - 9. Working Pressure Rating: 500 psig.
 - 10. Maximum Operating Temperature: 240 deg F.
- J. Straight-Type Strainers:
 - 1. Body: Welded steel with corrosion-resistant coating.
 - 2. Screen: 100-mesh stainless steel.
 - 3. End Connections: Socket or flare.
 - 4. Working Pressure Rating: 500 psig.
 - 5. Maximum Operating Temperature: 275 deg F.
- K. Angle-Type Strainers:
 - 1. Body: Forged brass or cast bronze.
 - 2. Drain Plug: Brass hex plug.
 - 3. Screen: 100-mesh monel.
 - 4. End Connections: Socket or flare.
 - 5. Working Pressure Rating: 500 psig.
 - 6. Maximum Operating Temperature: 275 deg F.
- L. Moisture/Liquid Indicators:
 - 1. Body: Forged brass.
 - 2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
 - 3. Indicator: Color-coded to show moisture content in parts per million (ppm).
 - 4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
 - 5. End Connections: Socket or flare.
 - 6. Working Pressure Rating: 500 psig.
 - 7. Maximum Operating Temperature: 240 deg F.
- M. Replaceable-Core Filter Dryers: Comply with AHRI 730 I-P.
 - 1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless steel screws, and neoprene gaskets.
 - 2. Filter Media: 10 micron, pleated with integral end rings; stainless steel support.
 - 3. Desiccant Media: Activated charcoal.
 - 4. Design: Reverse flow (for heat-pump applications).
 - 5. End Connections: Socket.
 - 6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
 - 7. Maximum Pressure Loss: 2 psig.
 - 8. Working Pressure Rating: 500 psig.
 - 9. Maximum Operating Temperature: 240 deg F.
- N. Permanent Filter Dryers: Comply with AHRI 730 I-P.

1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless steel support.
3. Desiccant Media: Activated charcoal.
4. Design: Reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: 2 psig.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg F.

O. Mufflers:

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or flare.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

P. Receivers: Comply with AHRI 495.

1. Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid-level indicator, and safety-relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 450 psig.
7. Maximum Operating Temperature: 250 deg F.

Q. Liquid Accumulators: Comply with AHRI 495.

1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

2.4 REFRIGERANTS

A. R-410A, ASHRAE 34: Pentafluoroethane/Difluoromethane.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Arkema Inc.
 - b. DuPont Fluorochemicals Div.
 - c. Genetron Refrigerants; Honeywell International Inc.
 - d. Mexichem Fluor, Inc. (Koura).

PART 3 - EXECUTION

3.1 PIPING APPLICATION SCHEDULES

- A. Refrigerant: R-410A
- B. Suction, Hot-Gas, and Liquid Tubing for Heat-Pump Applications, NPS 1-1/2 (DN 40) and Smaller: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed or soldered joints.
- C. Suction, Hot-Gas, and Liquid Tubing for Heat-Pump Applications, NPS 4 (DN 100) and Smaller: Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with brazed **[or]** **[soldered]** joints.
- D. Suction, Hot-Gas, and Liquid Tubing for Heat-Pump Applications, NPS 2 to NPS 4 (DN 50 to DN 100): Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.
- E. Safety-Relief-Valve Discharge Tubing for Heat-Pump Applications, Copper: Type ACR, drawn-temper or annealed-temper tubing and wrought-copper fittings with brazed or soldered joints
- F. Safety-Relief-Valve Discharge Piping for Heat-Pump Applications, Steel: Schedule 40, black steel and wrought-steel fittings with welded joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

- A. Install packed-angle valves in suction and discharge lines of compressor.
- B. Install service valves for gauge taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.
- C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.
- D. Except as otherwise indicated, install packed-angle valves on inlet and outlet side of filter dryers.
- E. Install a full-size, three-valve bypass around filter dryers.
- F. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.
- G. Install thermostatic expansion valves as close as possible to distributors on evaporators.
 - 1. Install valve so diaphragm case is warmer than bulb.
 - 2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
 - 3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

- H. Install safety-relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside in accordance with ASHRAE 15.
- I. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.
- J. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for the device being protected:
 - 1. Solenoid valves.
 - 2. Thermostatic expansion valves.
 - 3. Hot-gas bypass valves.
 - 4. Compressor.
- K. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.
- L. Install receivers sized to accommodate pump-down charge.
- M. Install flexible connectors at compressors.
- N. Provide refrigerant locking caps on refrigerant charging ports that are located outdoors unless otherwise protected from unauthorized access by a means acceptable to authority having jurisdiction.

3.3 INSTALLATION OF PIPING, GENERAL

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.
- B. Install refrigerant piping in accordance with ASHRAE 15.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. 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.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping adjacent to machines to allow service and maintenance.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Select system components with pressure rating equal to or greater than system operating pressure.

- J. Refer to Section 230923 "Direct Digital Control (DDC) System for HVAC" and Section 230993.11 "Sequence of Operations for HVAC DDC" for solenoid valve controllers, control wiring, and sequence of operation.
- K. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- L. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Section 083113 "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
- M. Install refrigerant piping in protective conduit where installed belowground.
- N. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- O. Slope refrigerant piping as follows:
 - 1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
 - 2. Install horizontal suction lines with a uniform slope downward to compressor.
 - 3. Install traps and double risers to entrain oil in vertical runs.
 - 4. Liquid lines may be installed level.
- P. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.
- Q. Before installation of steel refrigerant piping, clean pipe and fittings using the following procedures:
 - 1. Shot blast the interior of piping.
 - 2. Remove coarse particles of dirt and dust by drawing a clean, lintless cloth through tubing by means of a wire or electrician's tape.
 - 3. Draw a clean, lintless cloth saturated with trichloroethylene through the tube or pipe. Continue this procedure until cloth is not discolored by dirt.
 - 4. Draw a clean, lintless cloth, saturated with compressor oil, squeezed dry, through the tube or pipe to remove remaining lint. Inspect tube or pipe visually for remaining dirt and lint.
 - 5. Finally, draw a clean, dry, lintless cloth through the tube or pipe.
 - 6. Safety-relief-valve discharge piping is not required to be cleaned but is required to be open to allow unrestricted flow.
- R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- S. Identify refrigerant piping and valves in accordance with Section 230553 "Identification for HVAC Piping and Equipment."
- T. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

- U. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- V. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.4 PIPE 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 pipe and fittings before assembly.
- C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.
- D. Soldered Joints: Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook."
- E. Brazed Joints: Construct joints in accordance with AWS BRH, "Brazing Handbook," Ch. 35, "Pipe and Tubing."
 - 1. Use Type BCuP (copper-phosphorus) alloy for joining copper socket fittings with copper pipe.
 - 2. Use Type BAg (cadmium-free silver) alloy for joining copper with bronze or steel.
- F. Threaded Joints: Thread steel pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and to restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Steel pipe can be threaded, but threaded joints must be seal brazed or seal welded.
- H. Welded Joints: Construct joints in accordance with AWS D10.12M/D10.12.
- I. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements for seismic restraints in Section 230548 "Vibration and Seismic Controls for HVAC."
- B. Comply with Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hangers, supports, and anchor devices.

C. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal runs less than 20 ft. long.
2. Roller hangers and spring hangers for individual horizontal runs 20 ft. or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 ft. or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

D. Install hangers for copper tubing, with maximum horizontal spacing and minimum rod diameters, to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

E. Support horizontal piping within 12 inches of each fitting.

F. Support vertical runs of copper tubing to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in "Performance Requirements" Article.
 - a. Fill system with nitrogen to the required test pressure.
 - b. System must maintain test pressure at the manifold gauge throughout duration of test.
 - c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
 - d. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

C. Prepare test and inspection reports.

3.7 SYSTEM CHARGING

A. Charge system using the following procedures:

1. Install core in filter dryers after leak test but before evacuation.
2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.

3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
4. Charge system with a new filter-dryer core in charging line.

3.8 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.
- B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.
- C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.
- D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
 1. Open shutoff valves in condenser water circuit.
 2. Verify that compressor oil level is correct.
 3. Open compressor suction and discharge valves.
 4. Open refrigerant valves but not bypass valves that are used for other purposes.
 5. Check open compressor-motor alignment and verify lubrication for motors and bearings.
- E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION 232300

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Sheet metal materials.
3. Duct liner.
4. Sealants and gaskets.
5. Hangers and supports.

1.2 DEFINITIONS

- A. OSHPD: Office of Statewide Health Planning and Development (State of California).

1.3 ACTION SUBMITTALS

A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of all duct runs from building grid lines.
6. Fittings.
7. Penetrations through fire-rated and other partitions.
8. Equipment installation based on equipment being used on Project.
9. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
10. Hangers and supports, including methods for duct and building attachment and vibration isolation.

C. Delegated Design Submittals:

1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.

5. Design Calculations: Calculations for selecting hangers and supports.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: A single set of plans or BIM model, drawn to scale, showing the items described in this Section, and coordinated with all building trades.
- B. Welding certificates.
- C. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and with performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports are to withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".
- C. Airstream Surfaces: Surfaces in contact with airstream comply with requirements in ASHRAE 62.1.
- D. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment," and Section 7 - "Construction and System Startup."
- E. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."
- F. Duct Dimensions: Unless otherwise indicated, all duct dimensions indicated on Drawings are inside clear dimensions and do not include insulation or duct wall thickness.

2.2 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
 1. Construct ducts of galvanized sheet steel unless otherwise indicated.
- B. Transverse Joints: Fabricate joints in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. For ducts with longest side less than 36 inches, select joint types in accordance with Figure 2-1.
 2. For ducts with longest side 36 inches or greater, use flange joint connector Type T-22, T-24, T-24A, T-25a, or T-25b. Factory-fabricated flanged duct connection system may be used if submitted and approved by engineer of record.
- C. Longitudinal Seams: Select seam types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials are to be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A653/A653M.
1. Galvanized Coating Designation: G60.
 2. Finishes for Surfaces Exposed to View: Mill phosphatized.

2.4 DUCT LINER

- A. Fibrous-Glass Duct Liner: Comply with ASTM C1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Knauf Insulation.
 - c. Owens Corning.
 2. Source Limitations: Obtain fibrous-glass duct liner from single manufacturer.
 3. Maximum Thermal Conductivity:
 - a. Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
 - b. Type II, Rigid: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.

B. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized steel; with beveled edge sized as required to hold insulation securely in place, but not less than 1-1/2 inches in diameter.

C. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 7-11, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
3. Butt transverse joints without gaps, and coat joint with adhesive.
4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm or greater.
7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:
 - a. Fan discharges.
 - b. Intervals of lined duct preceding unlined duct.
 - c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.
9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.
 - a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.
10. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

2.5 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets are to be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested in accordance with UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
 - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 - 2. Tape Width: 3 inches.
 - 3. Sealant: Modified styrene acrylic.
 - 4. Water resistant.
 - 5. Mold and mildew resistant.
 - 6. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
 - 7. Service: Indoor and outdoor.
 - 8. Service Temperature: Minus 40 to plus 200 deg F.
 - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
- C. Water-Based Joint and Seam Sealant:
 - 1. Application Method: Brush on.
 - 2. Solids Content: Minimum 65 percent.
 - 3. Shore A Hardness: Minimum 20.
 - 4. Water resistant.
 - 5. Mold and mildew resistant.
 - 6. VOC: Maximum 75 g/L (less water).
 - 7. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
 - 8. Service: Indoor or outdoor.
 - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
- D. Solvent-Based Joint and Seam Sealant:
 - 1. Application Method: Brush on.
 - 2. Base: Synthetic rubber resin.
 - 3. Solvent: Toluene and heptane.
 - 4. Solids Content: Minimum 60 percent.
 - 5. Shore A Hardness: Minimum 60.
 - 6. Water resistant.
 - 7. Mold and mildew resistant.
 - 8. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
 - 9. Service: Indoor or outdoor.
 - 10. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.
- E. Flanged Joint Sealant: Comply with ASTM C920.
 - 1. General: Single-component, acid-curing, silicone, elastomeric.

2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.

2.6 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Galvanized-steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A603.
- E. Steel Cables for Stainless Steel Ducts: Stainless steel complying with ASTM A492.
- F. Steel Cable End Connections: Galvanized-steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
 2. Supports for Stainless Steel Ducts: Stainless steel shapes and plates.
 3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and coordination drawings.
- B. Install ducts in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install ducts in maximum practical lengths with fewest possible joints.
- D. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

- E. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- H. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- I. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- J. Protect duct interiors from moisture, construction debris and dust, and other foreign materials both before and after installation.
- K. Elbows: Use long-radius elbows wherever they fit.
 - 1. Fabricate 90-degree rectangular mitered elbows to include turning vanes.
 - 2. Fabricate 90-degree round elbows with a minimum of three segments for 12 inches and smaller and a minimum of five segments for 14 inches and larger.
- L. Branch Connections: Use lateral or conical branch connections.

3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.
- D. Maintain consistency, symmetry, and uniformity in arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- B. Seal ducts at a minimum to the following seal classes in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 2. Outdoor, Supply-Air Ducts: Seal Class A.
 3. Outdoor, Exhaust Ducts: Seal Class C.
 4. Outdoor, Return-Air Ducts: Seal Class C.
 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
 6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
 7. Unconditioned Space, Exhaust Ducts: Seal Class C.
 8. Unconditioned Space, Return-Air Ducts: Seal Class B.
 9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
 11. Conditioned Space, Exhaust Ducts: Seal Class B.
 12. Conditioned Space, Return-Air Ducts: Seal Class C.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
1. Where practical, install concrete inserts before placing concrete.
 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 5. Do not use powder-actuated concrete fasteners for seismic restraints. Coordinate with Section 230548 "Vibration and Seismic Controls for HVAC."
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 DUCTWORK CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 PAINTING

- A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

3.7 FIELD QUALITY CONTROL

- A. Duct System Cleanliness Tests:
 - 1. Visually inspect duct system to ensure that no visible contaminants are present.
 - 2. Test sections of metal duct system, chosen randomly by Owner, for cleanliness in accordance with "Description of Method 3 - NADCA Vacuum Test" in NADCA ACR, "Assessment, Cleaning and Restoration of HVAC Systems."
 - a. Acceptable Cleanliness Level: Net weight of debris collected on the filter media is to not exceed 0.75 mg/100 sq. cm.
- B. Duct system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.8 DUCT CLEANING

- A. Clean new duct system(s) before testing, adjusting, and balancing.
- B. For cleaning of existing ductwork, see Section 230130.52 "Existing HVAC Air Distribution System Cleaning."
- C. Use duct cleaning methodology as indicated in NADCA ACR.
- D. Use service openings for entry and inspection.
 - 1. Provide openings with access panels appropriate for duct static-pressure and leakage class at dampers, coils, and any other locations where required for inspection and cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Section 233300 "Air Duct Accessories" for access panels and doors.
 - 2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
 - 3. Remove and reinstall ceiling to gain access during the cleaning process.

E. Particulate Collection and Odor Control:

1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

F. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).
2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

G. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
5. Clean coils and coil drain pans in accordance with NADCA ACR. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
6. Provide drainage and cleanup for wash-down procedures.
7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents in accordance with manufacturer's written instructions after removal of surface deposits and debris.

3.9 STARTUP

- A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.10 DUCT SCHEDULE

- A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:
 - 1. Fabricate all ducts to achieve SMACNA pressure class, seal class, and leakage class as indicated below.
 - 2. **<Insert requirements>**.
- B. Exhaust Ducts:
 - 1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
 - a. Pressure Class: Negative 1-inch wg.
 - b. Minimum SMACNA Seal Class: A if negative pressure, and A if positive pressure.
 - c. SMACNA Leakage Class for Rectangular: 2.
- C. Outdoor-Air (Not Filtered, Heated, or Cooled) Ducts:
 - 1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
 - a. Pressure Class: Positive or negative 1-inch wg.
 - b. Minimum SMACNA Seal Class: A.
 - c. SMACNA Leakage Class for Rectangular: 8.
 - d. SMACNA Leakage Class for Round and Flat Oval: 8.
- D. Elbow Configuration:
 - 1. Rectangular Duct - Requirements for Different Velocities: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Velocity 1000 fpm or Lower:
 - 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
 - 2) Mitered Type RE 4 without vanes.
 - b. Velocity 1000 to 1500 fpm:
 - 1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
 - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 - c. Velocity 1500 fpm or Higher:
 - 1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - 2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

- 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
 2. Rectangular Duct - Requirements for All Velocities: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
 - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
 - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
 - c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
- E. Branch Configuration:
1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
 - a. Rectangular Main to Rectangular Branch: 45-degree entry.
 - b. Rectangular Main to Round Branch: Conical spin in.
 2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
 - a. Velocity 1000 fpm or Lower: 90-degree tap.
 - b. Velocity 1000 to 1500 fpm: Conical tap.
 - c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 233113

SECTION 233416 - CENTRIFUGAL HVAC FANS

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. Square in-line centrifugal fans.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes for fans.
 - 2. Rated capacities, operating characteristics, and furnished specialties and accessories.
 - 3. Certified fan performance curves with system operating conditions indicated.
 - 4. Certified fan sound-power ratings.
 - 5. Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 6. Material thickness and finishes, including color charts.
 - 7. Dampers, including housings, linkages, and operators.
 - 8. Fan speed controllers.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment 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.
 - 4. Design Calculations: Calculate requirements for selecting vibration isolators and for designing vibration isolation bases.
 - 5. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
- C. Delegated Design Submittal: For vibration isolation, supports, indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Design Calculations: Calculate requirements for selecting vibration isolators, supports.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Fan room layout and relationships between components and adjacent structural and mechanical elements, drawn to scale, and coordinated with each other, using input from installers of the items involved.
- B. Seismic Qualification Data: For fans, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity, and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For centrifugal fans to include in normal operation, emergency operation, and maintenance manuals with replacement parts listing.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Belts: One set(s) for each belt-driven unit.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of unit components.
- C. ASHRAE 62.1 Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Startup."
- D. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- E. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design vibration isolation, and supports, including comprehensive

engineering analysis by a qualified professional engineer, using performance and design criteria indicated.

- F. Capacities and Characteristics – See Schedules on Drawings:

2.2 SQUARE IN-LINE CENTRIFUGAL FANS

- 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. Greenheck Fan Corporation.
2. Loren Cook Company.
3. PennBarry; division of Air System Components.

- B. Description: Square in-line centrifugal fans.

- C. Housing:

1. Housing Material: Reinforced steel.
2. Housing Coating: None.
3. Housing Construction: Side panels shall be easily removable for service. Include inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.

- D. Direct-Drive Units: Motor mounted in airstream, factory wired to disconnect switch located on outside of fan housing.

- E. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosures around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

- F. Fan Wheels: Aluminum airfoil blades welded to aluminum hub.

- G. Accessories:

1. Access for Inspection, Cleaning, and Maintenance: Comply with requirements in ASHRAE 62.1.
2. Variable-Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
3. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.
4. Companion Flanges: For inlet and outlet duct connections.
5. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.
6. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.
7. Side Discharge: Flange connector and attachment hardware to provide right-angle discharge on side of unit.

2.3 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
- B. Where variable-frequency drives are indicated or scheduled, provide fan motor compatible with variable-frequency drive.

2.4 SOURCE QUALITY CONTROL

- A. AMCA Certification for Fan Sound Performance Rating: Test, rate, and label in accordance with AMCA 311.
- B. Operating Limits: Classify fans in accordance with AMCA 99, Section 14.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install centrifugal fans level and plumb.
- B. Disassemble and reassemble units, as required for moving to the final location, according to manufacturer's written instructions.
- C. Lift and support units with manufacturer's designated lifting or supporting points.
- D. Equipment Mounting:
 - 1. Install floor- or roof-mounted centrifugal fans on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 2. Support duct-mounted and other hanging centrifugal fans directly from the building structure, using suitable hanging systems as specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
 - 3. Comply with requirements for vibration isolation and seismic-control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
 - 4. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."
- E. Install units with clearances for service and maintenance.
- F. Label fans according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.2 DUCTWORK AND PIPING CONNECTIONS

- A. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 233300 "Air Duct Accessories."
- B. Install ducts adjacent to fans to allow service and maintenance.
- C. Install piping from scroll drain connection, with trap with seal equal to 1.5 times specified static pressure, to nearest floor drain with pipe sizes matching the drain connection.
- D. Install heat tracing on all drain piping subject to freezing temperature and as indicated on Drawings. Furnish and install heat tracing according to Section 230533 "Heat Tracing for HVAC Piping."

3.3 ELECTRICAL CONNECTIONS

- A. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Install electrical devices furnished by manufacturer, but not factory mounted, according to NFPA 70 and NECA 1.
- D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
 - 1. Nameplate shall be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
 - 2. Nameplate shall be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least 1/2 inch high.

3.4 CONTROL CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring according to Section 260523 "Control-Voltage Electrical Power Cables."

3.5 .STARTUP SERVICE:

- A. Perform startup service.
 - 1. Complete installation and startup checks in accordance with manufacturer's written instructions.
 - 2. Verify that shipping, blocking, and bracing are removed.

3. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
4. Verify that cleaning and adjusting are complete.
5. For direct-drive fans, verify proper motor rotation direction and verify fan wheel free rotation and smooth bearing operation.
6. For belt-drive fans, disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
7. Adjust belt tension.
8. Adjust damper linkages for proper damper operation.
9. Verify lubrication for bearings and other moving parts.
10. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
11. Disable automatic temperature-control operators, energize motor and confirm proper motor rotation and unit operation, adjust fan to indicated rpm, and measure and record motor voltage and amperage.
12. Shut unit down and reconnect automatic temperature-control operators.
13. Remove and replace malfunctioning units and retest as specified above.

3.6 ADJUSTING

- A. Adjust damper linkages for proper damper operation.
- B. Adjust belt tension.
- C. Lubricate bearings.
- D. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.7 CLEANING

- A. After completing system installation and testing, adjusting, and balancing and after completing startup service, clean fans internally to remove foreign material and construction dirt and dust

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 1. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Fans and components will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.9 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain centrifugal fans.

END OF SECTION 233416

SECTION 233713.23 - REGISTERS AND GRILLES

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. Adjustable blade face registers and grilles.
 - 2. Fixed face registers and grilles.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Register and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.
- B. Samples: For each exposed product and for each color and texture specified. Smallest size register and grille indicated.
- C. Samples for Initial Selection: For registers and grilles with factory-applied color finishes. Smallest size register and grille indicated.
- D. Samples for Verification: For registers and grilles, in manufacturer's standard sizes to verify color selected. Smallest size register and grille indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching hangers to building structure.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 5. Duct access panels.

- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 REGISTERS

- A. Adjustable Blade Face Register:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anemostat Air Distribution; Anemostat, Inc.; Mestek, Inc.
 - b. Price Industries Limited.
 - c. Titus; brand of Johnson Controls International plc, Global Products.
2. Material: Steel.
3. Finish: Baked enamel, white.
4. Face Blade Arrangement: Horizontal spaced 3/4 inch apart.
5. Core Construction: Integral.
6. Rear-Blade Arrangement: Vertical spaced 3/4 inch apart.
7. Frame: 1 inch wide.
8. Mounting: Countersunk screw.

2.2 GRILLES

- A. Adjustable Blade Face Grille:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Anemostat Air Distribution; Anemostat, Inc.; Mestek, Inc.
 - b. Price Industries Limited.
 - c. Titus; brand of Johnson Controls International plc, Global Products.
2. Material: Steel.
3. Finish: Baked enamel, white.
4. Face Blade Arrangement: Horizontal spaced 3/4 inch apart.
5. Core Construction: Integral.
6. Rear-Blade Arrangement: Vertical spaced 3/4 inch apart.
7. Frame: 1 inch wide.
8. Mounting: Countersunk screw.

2.3 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate registers and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where registers and grilles are installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install registers and grilles level and plumb.
- B. Outlets and Inlets Locations: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install registers and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust registers and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713.23

SECTION 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

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 split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples for Initial Selection: For units with factory-applied color finishes.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filters: One set(s) for each air-handling unit.
 - 2. Gaskets: One set(s) for each access door.
 - 3. Fan Belts: One set(s) for each air-handling unit fan.

1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance:
 - 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
 - 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-up."
- C. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1.

1.8 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period:
 - a. For Compressor: Five year(s) from date of Substantial Completion.
 - b. For Parts: Five year(s) from date of Substantial Completion.
 - c. For Labor: One year(s) from date of Substantial Completion.

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. LG.
 2. Carrier Global Corporation.
 3. Mitsubishi Electric & Electronics USA, Inc.

2.2 INDOOR UNITS (5 TONS OR LESS)

A. Concealed Evaporator-Fan Components:

1. Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
2. Insulation: Faced, glass-fiber duct liner.
3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
4. Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
5. Fan Motors:
 - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
 - c. Wiring Terminations: Connect motor to chassis wiring with plug connection.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
7. Filters: Permanent, cleanable.
8. Condensate Drain Pans:
 - a. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.
 - 1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
 - 2) Depth: A minimum of 2 inches deep.
 - b. Single-wall, stainless-steel sheet.
 - c. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
 - 1) Minimum Connection Size: NPS 1.

- d. Pan-Top Surface Coating: Asphaltic waterproofing compound.
- e. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.

B. Wall-Mounted, Evaporator-Fan Components:

- 1. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.
- 2. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.
- 3. Fan: Direct drive, centrifugal.
- 4. Fan Motors:
 - a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
 - b. Multitapped, multispeed with internal thermal protection and permanent lubrication.
 - c. Enclosure Type: Totally enclosed, fan cooled.
 - d. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
 - e. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
 - f. Mount unit-mounted disconnect switches on exterior of unit.
- 5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- 6. Air Filtration Section:
 - a. General Requirements for Air Filtration Section:
 - 1) Comply with NFPA 90A.
 - 2) Minimum MERV according to ASHRAE 52.2.
 - 3) Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.
 - b. Disposable Panel Filters:
 - 1) Factory-fabricated, viscous-coated, flat-panel type.
 - 2) Thickness: 1 inch.
 - 3) MERV according to ASHRAE 52.2: 8.
 - 4) Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.
 - 5) Frame: Galvanized steel, with metal grid on outlet side, steel rod grid on inlet side, and hinged; with pull and retaining handles.

2.3 OUTDOOR UNITS (5 TONS OR LESS)

A. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
 - a. Compressor Type: Scroll.
 - b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
 - c. Refrigerant: R-410A.
 - d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.
3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits operation down to 45 deg F.
7. Mounting Base: Polyethylene.

2.4 ACCESSORIES

- A. Control equipment and sequence of operation are specified in Section 230923 "Direct Digital Control (DDC) System for HVAC" and Section 230993.11 "Sequence of Operations for HVAC DDC."
- B. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
- C. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:
 1. Compressor time delay.
 2. 24-hour time control of system stop and start.
 3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
 4. Fan-speed selection including auto setting.
- D. Automatic-reset timer to prevent rapid cycling of compressor.
- E. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
- F. Drain Hose: For condensate.
- G. Monitoring:
 1. Monitor constant and variable motor loads.
 2. Monitor variable-frequency-drive operation.
 3. Monitor economizer cycle.
 4. Monitor cooling load.

5. Monitor air distribution static pressure and ventilation air volumes.

2.5 CAPACITIES AND CHARACTERISTICS – SEE SCHEDULES ON DRAWINGS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- C. Install roof-mounted, compressor-condenser components on equipment supports specified in Section 077200 "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.
- D. Equipment Mounting:
 1. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."
- E. Install and connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- C. Duct Connections: Duct installation requirements are specified in Section 233113 "Metal Ducts." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Air Duct Accessories."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 238126

Electrical Specifications

DIVISION 26 - ELECTRICAL

260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES	5
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	6
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	5
260533	RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS	11
260544	SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING	4
260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS	11
262726	WIRING DEVICES	8
262813	FUSES	3
262816	ENCLOSED SWITCHES AND CIRCUIT BREAKERS	7

END OF TABLE OF CONTENTS

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- 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. Alpha Wire Company.
 - 2. Belden Inc.
 - 3. Cerro Wire LLC.
 - 4. Encore Wire Corporation.
 - 5. General Cable Technologies Corporation.
 - 6. General Cable; General Cable Corporation.
 - 7. Senator Wire & Cable Company.
 - 8. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN/THWN-2, Type XHHW-2 and Type SO.
- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC mineral-insulated, metal-sheathed cable, Type MI and Type SO with ground wire.
- E. VFC Cable:
 - 1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
 - 2. Type TC-ER with oversized crosslinked polyethylene insulation, spiral-wrapped foil plus 85 percent coverage braided shields and insulated full-size ground wire, and sunlight- and oil-resistant outer PVC jacket.

2.2 CONNECTORS AND SPLICES

- 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. 3M.
 - 2. AFC Cable Systems, Inc.
 - 3. Gardner Bender.
 - 4. Hubbell Power Systems, Inc.
 - 5. Ideal Industries, Inc.
 - 6. ILSCO.
 - 7. NSi Industries LLC.
 - 8. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 - 9. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway or Mineral-insulated, metal-sheathed cable, Type MI.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway, Metal-clad cable, Type MC or Mineral-insulated, metal-sheathed cable, Type MI.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway or Type XHHW-2, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- I. VFC Output Circuits: Type TC-ER cable with braided shield.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
 - a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

- b. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- B. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- C. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

PART 4 -

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

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 grounding and bonding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.
 - 2. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency and testing agency's field supervisor.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

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. Burndy; Part of Hubbell Electrical Systems.

2. ERICO International Corporation.
3. Galvan Industries, Inc.; Electrical Products Division, LLC.
4. Harger Lightning & Grounding.
5. ILSCO.
6. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
7. Siemens Power Transmission & Distribution, Inc.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 1. Solid Conductors: ASTM B 3.
 2. Stranded Conductors: ASTM B 8.
 3. Tinned Conductors: ASTM B 33.
 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
- D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- E. Metallic Fences: Comply with requirements of IEEE C2.
 - 1. Grounding Conductor: Bare, tinned copper, not less than No. 8 AWG.
 - 2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
 - 3. Barbed Wire: Strands shall be bonded to the grounding conductor.

3.5 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least two rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.
- G. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
 - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 - 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

- a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 - 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 - 4. Manhole Grounds: 10 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

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. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.

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. Hangers.
 - b. Steel slotted support systems.
 - c. Trapeze hangers.
 - d. Clamps.
 - e. Turnbuckles.
 - f. Sockets.
 - g. Eye nuts.
 - h. Saddles.
 - i. Brackets.
 - 2. Include rated capacities and furnished specialties and accessories.
- B. Delegated-Design Submittal: For hangers and supports for electrical systems.
 - 1. Include design calculations and details of trapeze hangers.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M.
 - 2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation, A Member of the ABB Group.
 - f. Unistrut; an Atkore International company.
 - 2. Material: Galvanized steel.
 - 3. Channel Width: 1-5/8 inches.
 - 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. 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) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.

- 4) Simpson Strong-Tie Co., Inc.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 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) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti, Inc.
 - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMTs, IMCs, and RMCs may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 - 6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base as follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

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. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Surface raceways
 - 5. Boxes, enclosures, and cabinets.
 - 6. Handholes and boxes for exterior underground cabling.

1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.5 INFORMATIONAL SUBMITTALS

- A. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- 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. AFC Cable Systems, Inc.
2. Allied Tube & Conduit.
3. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
4. Republic Conduit.
5. Southwire Company.
6. Thomas & Betts Corporation, A Member of the ABB Group.
7. Western Tube and Conduit Corporation.
8. Wheatland Tube Company.

- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. IMC: Comply with ANSI C80.6 and UL 1242.
- E. EMT: Comply with ANSI C80.3 and UL 797.
- F. FMC: Comply with UL 1; zinc-coated steel.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 2. Fittings for EMT:
 - a. Material: Steel or die cast.
 - b. Type: Compression.
 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- I. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- 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. AFC Cable Systems, Inc.
 2. Arnco Corporation.
 3. CANTEX INC.
 4. CertainTeed Corporation.
 5. Kraloy.
 6. RACO; Hubbell.
 7. Thomas & Betts Corporation, A Member of the ABB Group.

- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- 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. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. MonoSystems, Inc.
 - 4. Square D.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. MonoSystems, Inc.
 - c. Legrand/Wiremold
 - d. Panduit

2.5 BOXES, ENCLOSURES, AND CABINETS

- 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. Cooper Technologies Company.
 2. EGS/Appleton Electric.
 3. Erickson Electrical Equipment Company.
 4. Hoffman; a brand of Pentair Equipment Protection.
 5. Hubbell Incorporated.
 6. MonoSystems, Inc.
 7. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 8. RACO; Hubbell.
 9. Thomas & Betts Corporation, A Member of the ABB Group.
 10. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Metal Floor Boxes:
1. Material: Cast metal or sheet metal.
 2. Type: Fully adjustable.
 3. Shape: Rectangular.
 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- J. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- K. Gangable boxes are allowed.
- L. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

M. Cabinets:

1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.6 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. NewBasis.
 - d. Oldcastle Precast, Inc.
 - e. Quazite: Hubbell Power Systems, Inc.
 - f. Synertech Moulded Products.
2. Standard: Comply with SCTE 77.
3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC."
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.7 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.

2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 1. Exposed Conduit: GRC or IMC.
 2. Concealed Conduit, Aboveground: GRC or IMC.
 3. Underground Conduit: RNC, Type EPC-40-PVC or Type EPC-80-PVC.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Physical Damage: GRC or IMC. Raceway locations include the following:
 - a. Loading dock.
 - b. Mechanical rooms.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 6. Damp or Wet Locations: GRC or IMC.
 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Do not install aluminum conduits, boxes, or fittings.
- F. Install surface raceways only where indicated on Drawings.
- G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from RNC, Type EPC-40-PVC to GRC or IMC before rising above floor.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

- M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- Q. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- R. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- T. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- U. Expansion-Joint Fittings:
 - 1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
 - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
 - 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install

- fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to bottom of box unless otherwise indicated.
- X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Z. Locate boxes so that cover or plate will not span different building finishes.
- AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- CC. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.
 2. Install backfill as specified in Section 312000 "Earth Moving."
 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
 4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

- a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
5. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits but a minimum of 6 inches below grade. Align planks along centerline of conduit.
6. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

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. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.
- B. Related Requirements:
 - 1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Plastic.
 - 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. HOLDRITE.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

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. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

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 electrical identification products.
- B. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Raceways and Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- C. Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.3 LABELS

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Champion America.
 - c. emedco.
 - d. Grafoplast Wire Markers.
 - e. LEM Products Inc.
 - f. Marking Services, Inc.
 - g. Panduit Corp.
 - h. Seton Identification Products.
- B. Snap-Around Labels for Raceways and Cables Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceways they identify, and that stay in place by gripping action.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Marking Services, Inc.
 - c. Panduit Corp.
 - d. Seton Identification Products.
- C. Self-Adhesive Labels:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. A'n D Cable Products.
 - b. Brady Corporation.
 - c. Brother International Corporation.
 - d. emedco.
 - e. Grafoplast Wire Markers.
 - f. Ideal Industries, Inc.
 - g. LEM Products Inc.
 - h. Marking Services, Inc.
 - i. Panduit Corp.
 - j. Seton Identification Products.
2. Preprinted, 3-mil-thick, polyester or vinyl flexible label with acrylic pressure-sensitive adhesive.
 - a. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized to fit the cable or raceway diameter, such that the clear shield overlaps the entire printed legend.
3. Polyester or Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
 - a. Nominal Size: 3.5-by-5-inch.
4. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
5. Marker for Tags: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

2.4 BANDS AND TUBES:

- A. Snap-Around, Color-Coding Bands for Raceways and Cables: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters of raceways or cables they identify, and that stay in place by gripping action.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Marking Services, Inc.
 - c. Panduit Corp.
- B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around cables they identify. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Panduit Corp.

2.5 TAPES AND STENCILS:

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Carlton Industries, LP.
 - b. Champion America.
 - c. Ideal Industries, Inc.
 - d. Marking Services, Inc.
 - e. Panduit Corp.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.
 - d. Marking Services, Inc.
- C. Tape and Stencil for Raceways Carrying Circuits 600 V or Less: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. LEM Products Inc.
 - b. Marking Services, Inc.
 - c. Seton Identification Products.
- D. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Carlton Industries, LP.
 - b. Seton Identification Products.
- E. Underground-Line Warning Tape
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Ideal Industries, Inc.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 - e. Reef Industries, Inc.
 - f. Seton Identification Products.

2. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 3. Color and Printing:
 - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
 4. Tag:
 - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
 - b. Width: 3 inches.
 - c. Overall Thickness: 5 mils.
 - d. Foil Core Thickness: 0.35 mil.
 - e. Weight: 28 lb/1000 sq. ft..
 - f. Tensile according to ASTM D 882: 70 lbf and 4600 psi.
- F. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.6 Tags

- A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.
 - d. Marking Services, Inc.
 - e. Seton Identification Products.
- B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.
 - d. Grafoplast Wire Markers.

- e. LEM Products Inc.
- f. Marking Services, Inc.
- g. Panduit Corp.
- h. Seton Identification Products.

C. Write-On Tags:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Carlton Industries, LP.
 - b. LEM Products Inc.
 - c. Seton Identification Products.
- 2. Polyester Tags: 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to raceway, conductor, or cable.
- 3. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.7 Signs

A. Baked-Enamel Signs:

- 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
- 2. 1/4-inch grommets in corners for mounting.
- 3. Nominal Size: 7 by 10 inches.
- 4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Carlton Industries, LP.
 - b. Champion America.
 - c. emedco.
 - d. Marking Services, Inc.

B. Metal-Backed Butyrate Signs:

- 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing and with colors, legend, and size required for application.
- 2. 1/4-inch grommets in corners for mounting.
- 3. Nominal Size: 10 by 14 inches.
- 4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Champion America.
 - c. emedco.
 - d. Marking Services, Inc.

C. Laminated Acrylic or Melamine Plastic Signs:

- 1. Engraved legend.
- 2. Thickness:
 - a. For signs up to 20 sq. inches, minimum 1/16-inch-
 - b. For signs larger than 20 sq. inches, 1/8 inch thick.

- c. Engraved legend with black letters on white face.
 - d. Punched or drilled for mechanical fasteners.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. emedco.
 - d. Marking Services, Inc.

2.8 CABLE TIES

- 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. Ideal Industries, Inc.
 2. Marking Services, Inc.
 3. Panduit Corp.
- B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black, except where used for color-coding.
- C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185 deg F.
 4. Color: Black.
- D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F according to ASTM D 638: 7000 psi.
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F.
 5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.
- J. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- K. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- L. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

3.3 IDENTIFICATION SCHEDULE

- A. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Snap-around labels. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.
- C. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:
 - 1. "STANDBY POWER."
 - 2. "POWER."
 - 3. "UPS."
- D. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- E. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.
- F. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.
- G. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive, self-laminating polyester labels with the conductor or cable designation, origin, and destination.
- H. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive, self-laminating polyester labels with the conductor designation.
- I. Conductors To Be Extended in the Future: Attach marker tape to conductors and list source.

- J. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker-tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- K. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- L. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- M. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Metal-backed, butyrate warning signs.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - a. Power-transfer switches.
 - b. Controls with external control power connections.
- N. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- O. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.
- P. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine plastic label, punched or drilled for mechanical fasteners. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

- d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
- 2. Equipment To Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Switchboards.
 - e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
 - f. Emergency system boxes and enclosures.
 - g. Enclosed switches.
 - h. Enclosed circuit breakers.
 - i. Enclosed controllers.
 - j. Variable-speed controllers.
 - k. Push-button stations.
 - l. Power-transfer equipment.
 - m. Contactors.
 - n. Remote-controlled switches, dimmer modules, and control devices.
 - o. Battery-inverter units.
 - p. Power-generating units.
 - q. Monitoring and control equipment.
 - r. UPS equipment.

END OF SECTION 260553

SECTION 262726 - WIRING DEVICES

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. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. USB charger devices.
 - 3. Twist-locking receptacles.
 - 4. Weather-resistant receptacles.
 - 5. Snap switches.
 - 6. Pendant cord-connector devices.
 - 7. Cord and plug sets.
 - 8. Floor service outlets and poke-through assemblies.

1.3 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.
- B. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- C. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.6 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Service-Outlet Assemblies: One for every 10, but no fewer than one.
 - 2. Poke-Through, Fire-Rated Closure Plugs: One for every five floor service outlets installed, but no fewer than two.

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. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - 2. Hubbell Incorporated; Wiring Device-Kellems.
 - 3. Leviton Manufacturing Co., Inc.
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

2.3 USB CHARGER DEVICES

- A. Tamper-Resistant, USB Charger Receptacles: 12 V dc, 2.0 A, USB Type A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1310, and FS W-C-596.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Eaton (Arrow Hart).

- b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- 2. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
- 3. USB Receptacles: Dual, Type A.
- 4. Line Voltage Receptacles: Dual, two pole, three wire, and self-grounding.

2.4 TWIST-LOCKING RECEPTACLES

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration as indicated on drawings, and UL 498.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).

2.5 PENDANT CORD-CONNECTOR DEVICES

- A. Description:
 - 1. Matching, locking-type plug and receptacle body connector.
 - 2. NEMA WD 6 Configurations L5-20P and L5-20R, heavy-duty grade, and FS W-C-596.
 - 3. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.
 - 4. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.6 CORD AND PLUG SETS

- A. Description:
 - 1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 - 2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
 - 3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.7 DECORATOR-STYLE DEVICES

- A. Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, and UL 498.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- B. GFCI, Feed-Through Type, Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and UL 943 Class A.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- C. GFCI, Weather-Resistant Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and UL 943 Class A.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
- D. Toggle Switches, Square Face, 120/277 V, 20 A: Comply with NEMA WD 1, UL 20, and FS W-S-896.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- E. Lighted Toggle Switches, Square Face, 120 V, 20 A: Comply with NEMA WD 1 and UL 20.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
 2. Description: With neon-lighted handle, illuminated when switch is "off."
- F. All branch circuits rated at 15 amperes shall only have receptacles rated at 15 amperes connected to it.

2.8 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Steel with white baked enamel, suitable for field painting.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.9 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Rectangular, solid brass with satin finish.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.

2.10 POKE-THROUGH ASSEMBLIES

- 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. Hubbell Incorporated; Wiring Device-Kellems.
 - 2. Pass & Seymour/Legrand (Pass & Seymour).
 - 3. Square D; by Schneider Electric.
 - 4. Thomas & Betts Corporation, A Member of the ABB Group.
 - 5. Wiremold / Legrand.
- B. Description:
 - 1. Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
 - 2. Comply with UL 514 scrub water exclusion requirements.
 - 3. Service-Outlet Assembly: Pedestal type with services indicated.
 - 4. Size: Selected to fit nominal 3-inch cored holes in floor and matched to floor thickness.
 - 5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
 - 6. Closure Plug: Arranged to close unused 3-inch cored openings and reestablish fire rating of floor.
 - 7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables.

2.11 FINISHES

- A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
- B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtail existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Dimmers:
1. Install dimmers within terms of their listing.
 2. Verify that dimmers used for fan speed control are listed for that application.
 3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar

problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 262813 - FUSES

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. Cartridge fuses rated 600 V ac and less for use in the following:
 - a. Control circuits.
 - b. Switchboards.
 - c. Enclosed controllers.
 - d. Enclosed switches.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles. Include the following for each fuse type indicated:
 - 1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
 - 2. Coordination charts and tables and related data.
 - 3. Fuse sizes for elevator feeders and elevator disconnect switches.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017700 "Closeout Procedures," include the following:
 - 1. Ambient temperature adjustment information.
 - 2. Current-limitation curves for fuses with current-limiting characteristics.
 - 3. Coordination charts and tables and related data.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.6 FIELD CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Bussmann; a division of Cooper Industries.
 - 2. Edison; a brand of Cooper Bussmann; a division of Cooper Industries.
 - 3. Littelfuse, Inc.
 - 4. Mersen USA.
- B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
 - 1. Type RK-1: 600-V, zero- to 600-A rating, 200 kAIC, time delay.
 - 2. Type CC: 600-V, zero- to 30-A rating, 200 kAIC, fast acting.
 - 3. Type J: 600-V, zero- to 600-A rating, 200 kAIC.
 - 4. Type L: 600-V, 601- to 6000-A rating, 200 kAIC, time delay.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. Service Entrance: Class L, time delay.
 - 2. Feeders: Class RK1, time delay.
 - 3. Motor Branch Circuits: Class RK1, time delay.
 - 4. Power Electronics Circuits: Class J, high speed.
 - 5. Other Branch Circuits: Class J, fast acting.
 - 6. Control Transformer Circuits: Class CC, time delay, control transformer duty.
 - 7. Provide open-fuse indicator fuses or fuse covers with open fuse indication.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

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. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Shunt trip switches.
 - 4. Molded-case circuit breakers.
 - 5. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
 - 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
 - 1. Test procedures used.

2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 2. Fuse Pullers: Two for each size and type.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
 2. Altitude: Not exceeding 6600 feet.

1.10 COORDINATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eaton Electrical Sector; Eaton Corporation.
 2. General Electric Company.
 3. Siemens Industry, Inc.
 4. Square D; by Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 4. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
 5. Lugs: Mechanical type, suitable for number, size, and conductor material.
 6. Service-Rated Switches: Labeled for use as service equipment.
 7. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac.

2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eaton Electrical Sector; Eaton Corporation.
 2. General Electric Company.
 3. Siemens Industry, Inc.
 4. Square D; by Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
 4. Lugs: Mechanical type, suitable for number, size, and conductor material.
 5. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac.

2.3 SHUNT TRIP SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company.
 - 3. Siemens Industry, Inc.
- B. General Requirements: Comply with UL 50, and UL 98, with Class J fuse block and 200-kA interrupting and short-circuit current rating.
- C. Type HD, Heavy-Duty, Four Pole, Single-Throw Fusible Switch: 600-V ac, 100 A; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, with clips or bolt pads to accommodate specified fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- D. Type HD, Heavy-Duty, Four Pole, Single-Throw Nonfusible Switch: 600-V ac, 100 A; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- E. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer of enough capacity to operate shunt trip, pilot, indicating and control devices.
- F. Accessories:
 - 1. Oiltight key switch for key-to-test function.
 - 2. Oiltight green ON pilot light.
 - 3. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
 - 4. Form C alarm contacts that change state when switch is tripped.
 - 5. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
 - 6. Hookstick Handle: Allows use of a hookstick to operate the handle.
 - 7. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.4 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: As indicated on the drawings.
- B. Circuit breakers must be constructed using glass-reinforced insulating material. Current carrying components must be completely isolated from handle and accessory mounting area.
- C. Circuit breakers must have toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. Circuit-breaker handle must be over center, be trip free, and reside in tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon must be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with push-to-trip button, located on face of circuit breaker to mechanically operate circuit-breaker tripping mechanism for maintenance and testing purposes.

- D. Maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings must be clearly marked on face of circuit breaker.
- E. MCCBs must be equipped with device for locking in isolated position.
- F. Lugs must be suitable for 60 deg C rated wire on 125 A circuit breakers and below.
- G. Standard: Comply with UL 489 with required interrupting capacity for available fault currents.
- H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- I. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
- J. Electronic Trip Circuit Breakers: Field-replaceable rating plug, RMS sensing, with the following field-adjustable settings:
 - 1. Instantaneous trip.
 - 2. Long- and short-time pickup levels.
 - 3. Long- and short-time time adjustments.
 - 4. Ground-fault pickup level, time delay, and I-squared t response.
- K. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.
- L. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.
- M. GFLS Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6 mA trip).
- N. GFEP Circuit Breakers: With Class B ground-fault protection (30 mA trip).
- O. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 - 3. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.

2.5 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 4.
 - 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and

- circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
- 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816

Project:

INTERIOR RENOVATIONS AT 40 PELHAM ROAD, NEW ROCHELLE

OWNER:
CITY OF NEW ROCHELLE

SITE ADDRESS
40 PELHAM ROAD
NEW ROCHELLE, NEW YORK 10801

Element 
Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7758 NJ LIC. AIO12158; NY LIC. 024305

Architect's Project #: 2023-12

NO. DATE REVISION

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

GENERAL NOTES

THESE DRAWINGS ARE INTENDED TO BE USED ONLY BY A COMPETENT, EXPERIENCED CONTRACTOR WHO HAS THOROUGHLY REVIEWED THE CONTRACT DOCUMENTS. THIS DESIGN PROFESSIONAL WILL NOT BE RESPONSIBLE FOR JOB SITE PROBLEMS DUE TO FAILURE TO INTERPRET THE DOCUMENTS CORRECTLY. REPRESENTATIVES OF THE ARCHITECT AND HIS CONSULTING ENGINEERS ARE AVAILABLE TO ANSWER QUESTIONS AND TO ASSIST THE CONTRACTOR BY EXPLAINING THE DESIGN INTENT. FAILURE BY THE CONTRACTOR TO UNDERSTAND THE COMPLEXITIES OF THE PROJECT AND THE SEQUENCE OF CONSTRUCTION CAN RESULT IN SERIOUS INJURY TO WORKERS. PROCEEDING WITH CONSTRUCTION WITHOUT A FULL UNDERSTANDING OF THE PROJECT AND WITHOUT A COMPLETE SET OF DESIGN DOCUMENTS WILL PUT BOTH THE PROJECT AND INDIVIDUALS AT RISK. THE CONTRACTOR ASSUMES TOTAL RESPONSIBILITY FOR ANY CONSEQUENCES OF THAT ACTION.

ALL CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR ADHERING TO THE PROJECT REQUIREMENTS FOUND ON THE DRAWINGS, IN THE SPECIFICATIONS AND OTHER DOCUMENTS WHICH ARE PART OF THE CONTRACT. ALL PARTIES MUST CAREFULLY STUDY ALL NOTES FOR ITEMS WHICH MAY PERTAIN TO THEIR TRADES. FAILURE TO READ THESE NOTES DOES NOT PERMIT THE CONTRACTOR TO DEViate FROM THEIR REQUIREMENTS. ALL CONTRACTORS AND SUBCONTRACTORS ON THIS PROJECT SHALL BE RESPONSIBLE FOR THE PROPER PERFORMANCE OF THEIR WORK, COORDINATION WITH OTHER TRADES, METHODS, SAFETY AND SECURITY ON THE JOB SITE. ELEMENT ARCHITECTURAL GROUP AND ITS AGENTS AND EMPLOYEES ARE NOT RESPONSIBLE OR LIABLE FOR THE ABOVE AND SHALL BE HELD HARMLESS AND INDEMNIFIED BY ALL CONTRACTORS AND SUBCONTRACTORS FROM ANY AND ALL CLAIMS, LOSSES, SUITS AND LEGAL ACTION WHATSOEVER ARISING FROM THE PERFORMANCE OF WORK ON THIS PROJECT.

THERE IS NO KNOWLEDGE OF HAZARDOUS MATERIALS PRESENT WITHIN THE LIMITS OF THE WORK. IF CONTRACTOR ENCOUNTERS HAZARDOUS MATERIALS DURING CONSTRUCTION, HE SHALL STOP WORK IMMEDIATELY AND NOTIFY THE OWNER. THE OWNER SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS FOR THE SAFE REMOVAL OF ALL HAZARDOUS MATERIALS BEFORE THE CONTRACTOR CAN RESUME WORK.

ACCEPTANCE OF DEVIATIONS FROM ANY OF THE REQUIREMENTS OF THESE NOTES SHALL BE AT THE SOLE DISCRETION OF THE ARCHITECT. ACCEPTANCE OF A DEVIATION FROM ANY REQUIREMENT SHALL NOT BE CONSTRUED AS PERMITTING ANY OTHER DEVIATION.

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB AND BRING TO THE ATTENTION OF THE ARCHITECT ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE INTENDED DESIGN. DO NOT SCALE THE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY AND FOR ALL PROPERTY AND PERSONAL DAMAGE OR INJURY RESULTING FROM CONSTRUCTION OPERATIONS. CONTRACTOR SHALL PROVIDE AND MAINTAIN NECESSARY PRECAUTIONS IN PROTECTING HIS MATERIALS AND WORK AREA.

THE SCOPE OF WORK, AS DETAILED BY THESE DOCUMENTS, REQUIRES ONE OR MORE BUILDING PERMITS FROM THE LOCAL MUNICIPALITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING FOR, AND OBTAINING ALL BUILDING PERMITS APPLICABLE, FROM THE LOCAL MUNICIPALITY HAVING JURISDICTION OVER THE PROJECT. NO CONSTRUCTION SHALL PROCEED PRIOR TO ISSUANCE OF THE NECESSARY PERMITS.

"FEES" FOR LOCAL MUNICIPALITY BUILDING PERMITS SHALL BE WAIVED.

BUILDING DEPT. NOTES

USE GROUP: S-1
CONSTRUCTION TYPES OF BUILDING.: II-B

CONSTRUCTION SQUARE FOOTAGE: +/-500 SQ.FT.

THE SCOPE OF WORK FOR THIS PROJECT CONSISTS OF:
1.) THE DEMOLITION AND ALTERATION OF EXISTING MEN'S TOILET ROOM TO NEW ADA COMPLIANT MEN'S ROOM.
2.) NEW WOMEN'S ADA COMPLIANT TOILET ROOM.
3.) NEW 8' HIGH WALL WITH SCREENING ABOVE AT LOCKER ROOM AREA,
4.) EXPAND LOUNGE AREA INTO EXISTING GARAGE AREA.
5.) NEW EPOXY FINISH APPLIED TO EXISTING GARAGE SLAB
6.) REPLACEMENT OF TWO EXTERIOR WINDOWS.

THE ABOVE SCOPE INCLUDES NEW LIGHTING AND FINISHES.

THE WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE 2020 IBC WITH NEW YORK STATE IBC 2018 WITH AMENDMENTS, 2020 MECHANICAL CODE OF NEW YORK STATE, 2020 ELECTRICAL CODE OF NEW YORK, 2020 PLUMBING CODE OF NEW YORK STATE, 2020 FIRE CODE OF NEW YORK STATE.

ALL OF THE WORK SHALL COMPLY WITH THE BARRIER FREE REQUIREMENTS, AND ALL REFERENCES TO THE ICC/ANSI A117.1-2009 AS WELL AS ALL ADA STATE AND LOCAL REGULATIONS.

NO CHANGE TO THE EXISTING BUILDING USE, OR OCCUPANCY, IS BEING PROPOSED UNDER THIS APPLICATION

ALL DRAWINGS AND WRITTEN MATERIAL APPEARING HEREIN CONSTITUTE ORIGINAL AND UNPUBLISHED WORK OF THE ARCHITECT AND THE ENGINEER AND MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT WRITTEN CONSENT OF THE ARCHITECT OR ENGINEER.

WARNING:

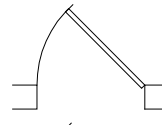

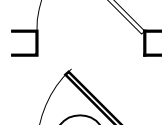
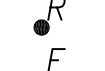
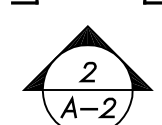
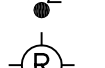
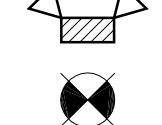
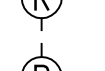
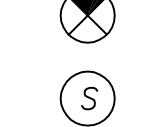
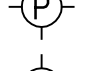
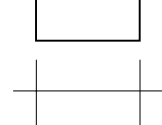
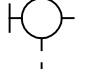
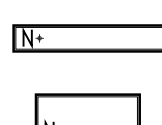

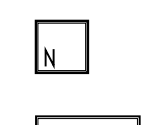
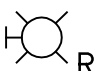
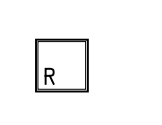

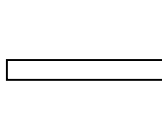
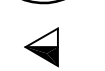
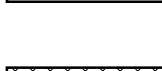

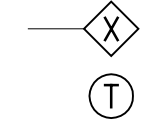

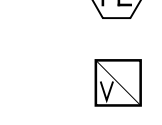

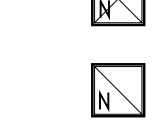
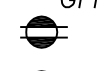
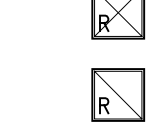

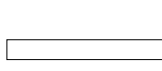

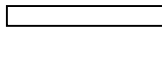
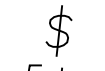
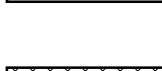
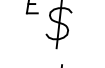
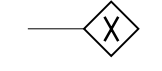

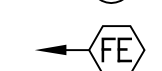


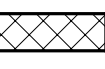

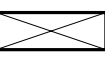

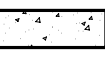

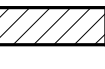
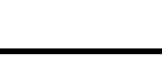
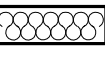

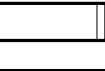




THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. AN ARCHITECT FOR AN ARCHITECT, A LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, OR A PROFESSIONAL ENGINEER FOR A PROFESSIONAL ENGINEER, IS A VIOLATION OF NEW YORK STATE EDUCATION LAW AND REGULATIONS AND IS A CLASS "A" MISDEMEANOR.

ABBREVIATIONS

A/C	AIR CONDITIONER	LAM.	LAMINATE
A.C.T.	ACOUSTICAL TILE	M.O.	MASONRY OPENING
A.F.F.	ABOVE FINISHED FLOOR	MAX.	MAXIMUM
ALUM.	ALUMINUM	MECH.	MECHANICAL
ARCH.	ARCHITECT	MIN.	MINIMUM
BD.	BOARD	NIC	NOT IN CONTRACT
BLK.	BLOCK	NTS	NOT TO SCALE
BM.	BREAM	O.C.	ON CENTER
C.T.	CERAMIC TILE	OPP.	OPPOSITE
CLG.	CEILING	OPNG.	OPENING
CMU	CONC. MASONRY UNIT	P.T.	PRESSURE TREATED
CONC.	CONCRETE	PTN	PARTITION
CONT.	CONTINUOUS	R	RISER
COL.	COLUMN	RD	ROOF DRAIN
DIA.	DIAMETER	REINF.	REINFORCING
DN	DOWN	REQ'D.	REQUIRED
DS	DOWNSPOUT	RH	ROOF HATCH
DWG.	DRAWING	R.O.	ROUGH OPENING
EA.	EACH	SIM.	SIMILAR
ELEV.	ELEVATION	STD.	STANDARD
EQ.	EQUAL	STL.	STEEL
EXIST.	EXISTING	STRUCT.	STRUCTURAL
F.D.	FLOOR DRAIN	T&G	TONGUE AND GROOVE
FIN.	FINISH	T.O.	TOP OF
GA.	GAUGE	TYP.	TYPICAL
GALV.	GALVANIZED	V	VENT
GWB	GYPSPUM WALL BOARD	VCT	VINYL COMPOSITION TILE
GYP.	GYPSPUM	VIF	VERIFY IN FIELD
H.M.	HOLLOW METAL	W/	WITH
		WD.	WOOD

SYMBOLS LEGEND

SOME SYMBOLS SHOWN IN LEGEND MAY NOT BE REPRESENTED ON PLANS

	EXISTING DOOR TO BE REMOVED		NEW SPRINK.
	EXISTING DOOR TO REMAIN		RELOCATED SPRINK.
	NEW DOOR W/ TAG		EXIST SPRINK.
	INTERIOR ELEVATION MARKER		NEW RECESSED LIGHT FIXTURE
	NEW EMERGENCY LIGHTING		NEW PENDANT LIGHT FIXTURE
	EXISTING EXIT SIGN		NEW WALL MOUNTED LIGHT FIXTURE
	NEW EXIT SIGN		NEW WEATHER PROOF WALL MOUNTED LIGHT FIXTURE
	NEW HARD WIRED SMOKE DETECTOR		RELOCATED WEATHER PROOF WALL MOUNTED LIGHT FIXTURE
	REMOVED RECESSED FLOOR LIGHT FIXTURE		NEW ELEC. CIRCUITING
	REMOVED CEILING GRID		NEW DATAPORT/ TELE.
	NEW 1x8 PENDANT LIGHT FIXTURE		EXISTING DATAPORT/ TELE.
	NEW 2x4 RECESSED LIGHT FIXTURE		NEW DUPLEX OUTLET
	NEW 2x2 RECESSED LIGHT FIXTURE		EXISTING DUPLEX OUTLET
	RELOCATED 2x4 RECESSED LIGHT FIXTURE		NEW GROUND FAULT OUTLET
	RELOCATED 2x2 RECESSED LIGHT FIXTURE		NEW GROUND FAULT DUPLEX OUTLET (WEATHER PROOF)
	WALL TO BE DEMOLISHED		NEW DEDICATED OUTLET
	WALL TO REMAIN		NEW GROUND FAULT DUPLEX OUTLET (WEATHER PROOF)
	NEW MTL. FRAMED WALL TO BE INSTALLED		NEW QUAD OUTLET
	NEW MASONRY WALL TO BE INSTALLED		NEW SWITCH
	PARTITION TYPE		EXISTING SWITCH
	EXISTING THERMOSTAT		NEW 3-WAY SWITCH
	NEW FIRE EXTINGUISHER		NEW DIMMER SWITCH
	NEW EXHAUST FAN/LIGHT COMBO.		MASONRY PLAN / SECTION
	NEW SUPPLY AIR REGISTER		ROUGH WOOD
	NEW RETURN AIR REGISTER		CONCRETE
	RELOCATED SUPPLY AIR REGISTER		BRICK PLAN / SECTION
	RELOCATED RETURN AIR REGISTER		BATT INSULATION
			RIGID INSULATION
			EARTH
			POROUS FILL

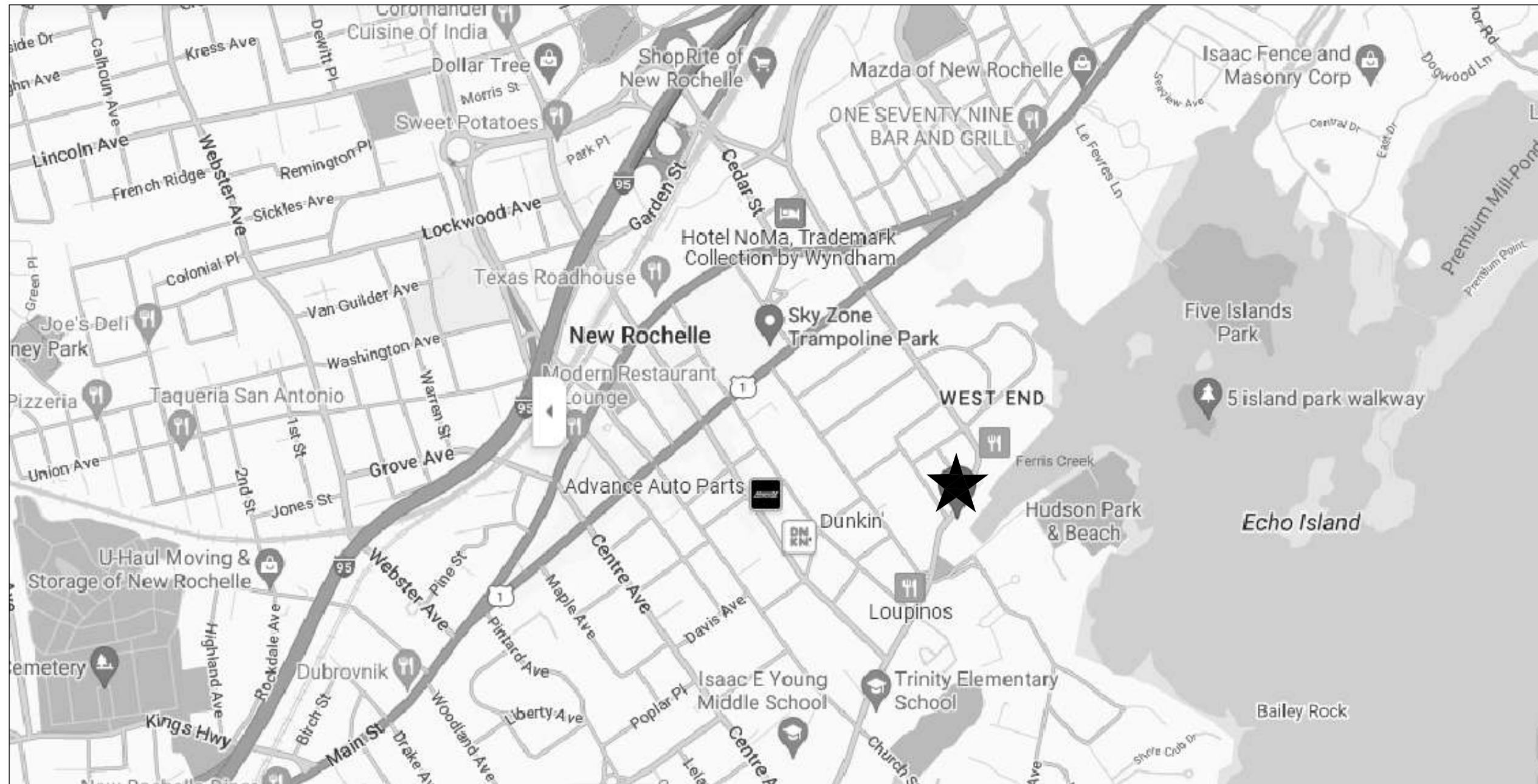
REGULATED MATERIALS

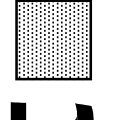
A. ASBESTOS: THE CONTRACTOR SHALL NOTIFY THE OWNER'S FIELD REPRESENTATIVE IF THEY SUSPECT THAT ASBESTOS CONTAINING MATERIALS AFFECT THEIR SCOPE OF CONSTRUCTION WORK. CONTRACTOR SHALL STOP WORK IMMEDIATELY SO AS TO MAKE ALL ARRANGEMENTS FOR THE SAFE REMOVAL BEFORE CONSTRUCTION ACTIVITIES CAN RESUME.

B. LEAD PAINT: THIS PROJECT IS NOT CONSIDERED A "LEAD ABATEMENT PROJECT" BY THE STATE OF NEW YORK, AND THERE IS NO KNOWLEDGE OF LEAD PAINT PRESENT WITHIN THE LIMITS OF THE SCOPE OF WORK. THE CONTRACTOR SHALL NOTIFY THE OWNER'S FIELD REPRESENTATIVE IF THEY SUSPECT THAT LEAD CONTAINING MATERIALS AFFECT THEIR SCOPE OF CONSTRUCTION. CONTRACTOR SHALL STOP WORK IMMEDIATELY SO AS TO MAKE ALL ARRANGEMENTS FOR THE SAFE REMOVAL BEFORE CONSTRUCTION ACTIVITIES CAN RESUME.

A-001	COVER SHEET
A-101	KEY PLANS, PARTIAL DEMO PLANS AND PARTIAL PLANS
A-102	PARTIAL DEMO PLANS, PARTIAL PLANS AND ELEVATIONS/SECTIONS
A-103	DETAILS AND SCHEDULES
P-001	PLUMBING GENERAL NOTES
P-061	PLUMBING REMOVAL PLAN
P-101	PLUMBING PROPOSED PLAN
P-401	PLUMBING RISER DIAGRAM
E-001	ELECTRICAL GENERAL NOTES, SYMBOLS, SCHEDULES AND ABBREVIATIONS
E-061	ELECTRICAL REMOVAL PARTIAL PLAN
E-101	ELECTRICAL PROPOSED PARTIAL PLAN
E-501	ELECTRICAL DETAILS

AREA MAP N.T.S.



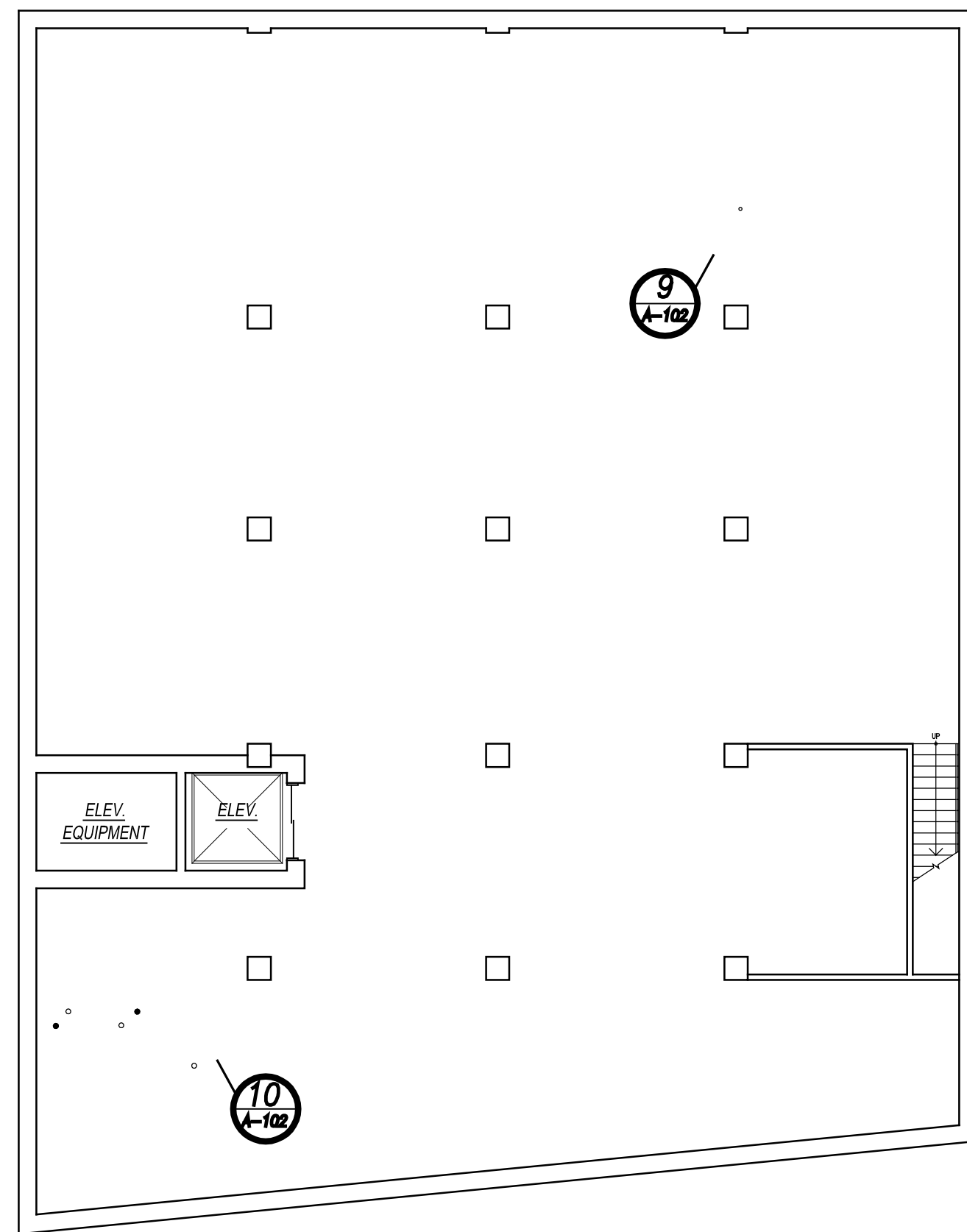
Element 
Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7758 NJ LIC. AIO12158; NY LIC. 024305

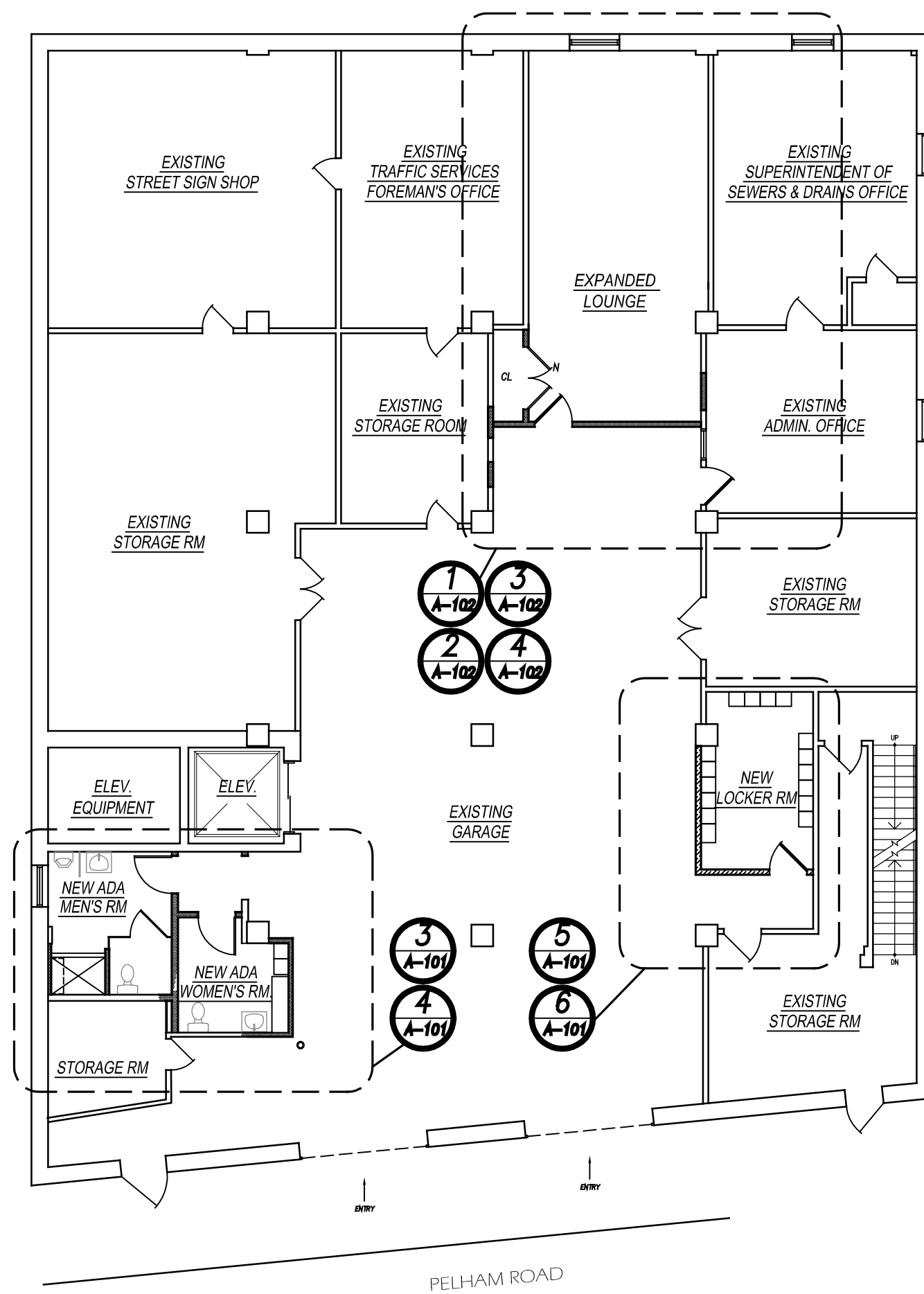
COVER SHEET

JOB:	2023-12
DATE:	10-6-23
SCALE:	AS SHOWN
DWN:	APK

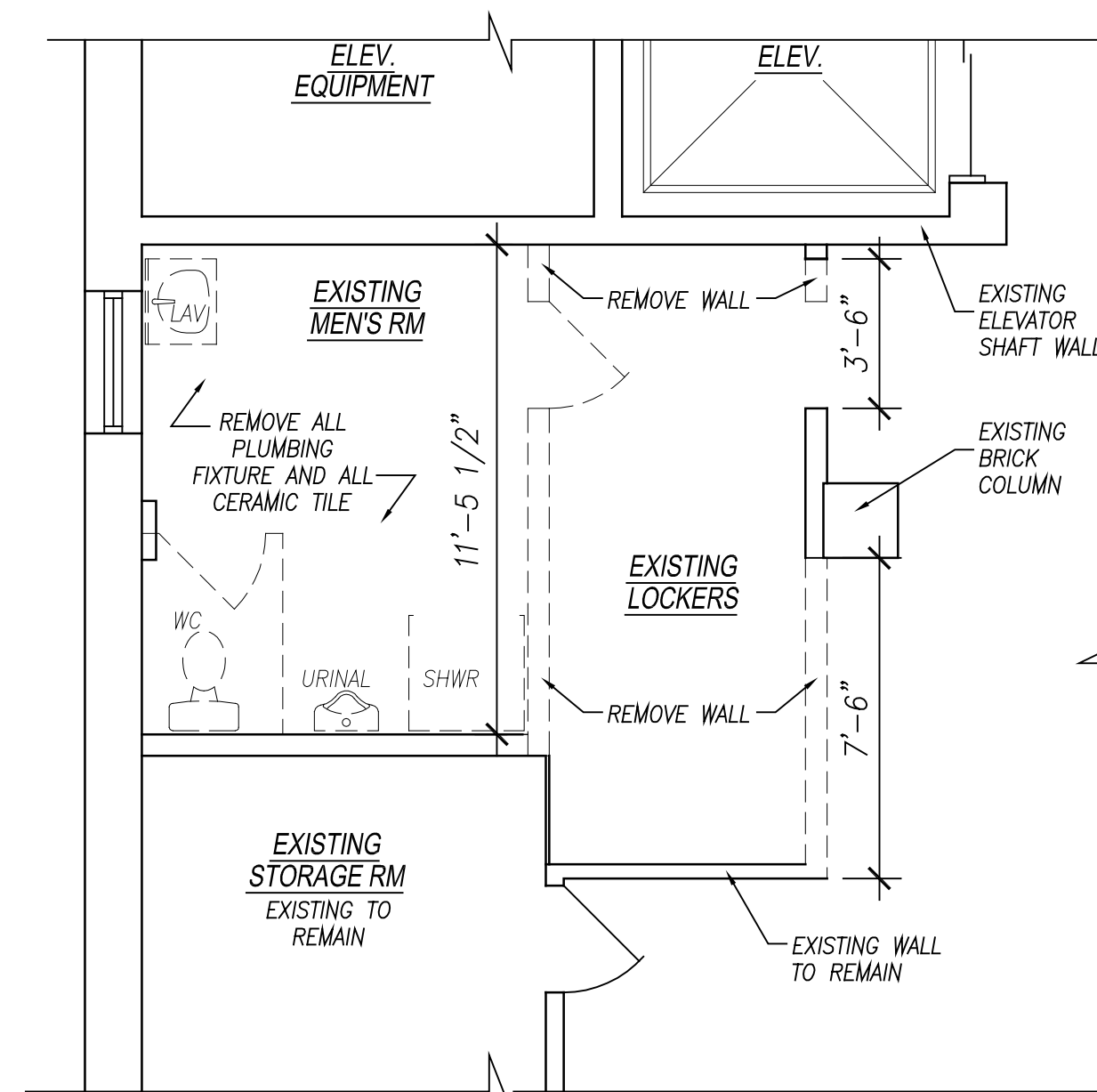
A-001.00



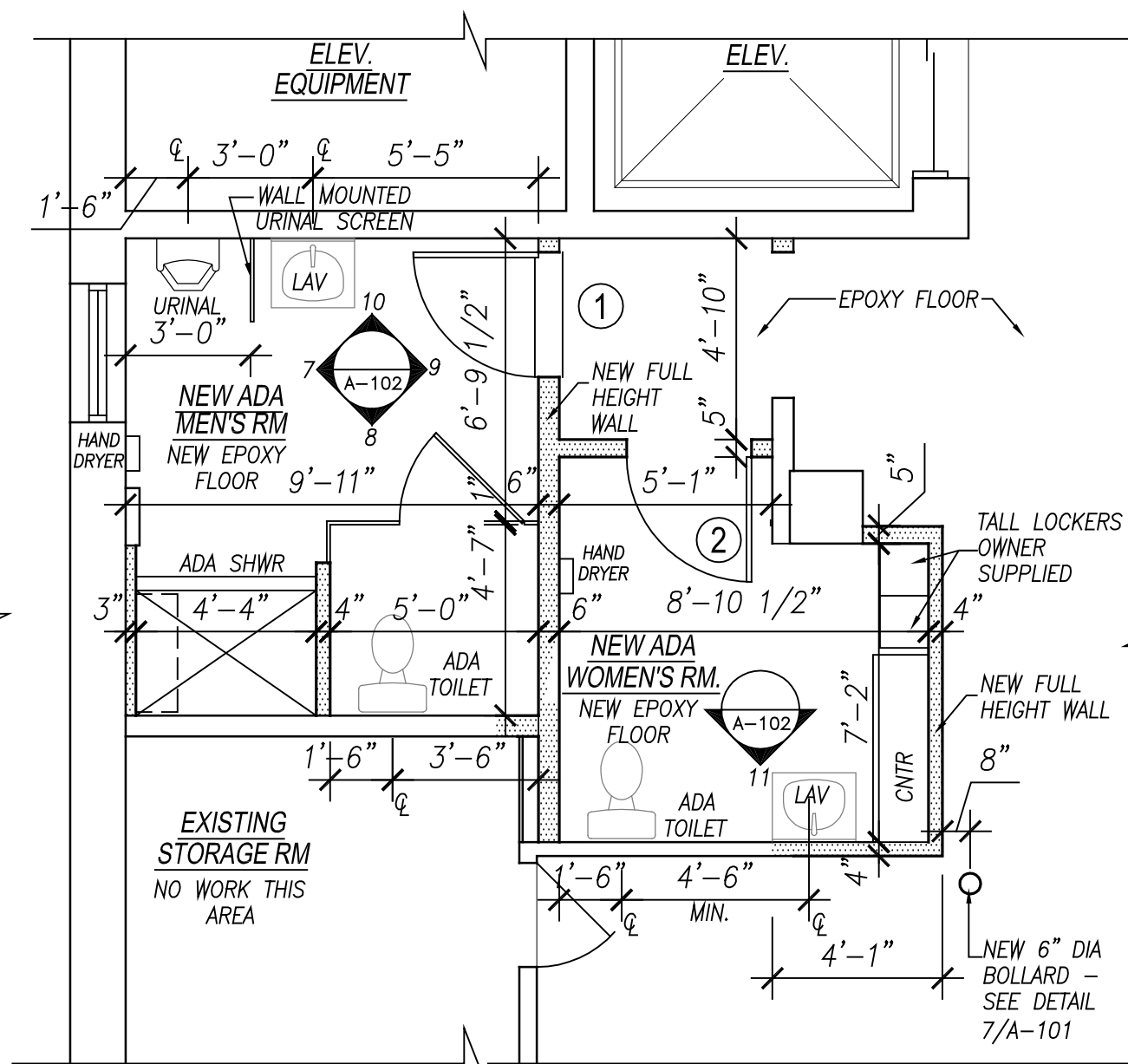
1 BASEMENT KEY PLAN
SCALE: 1/32" = 1'-0"



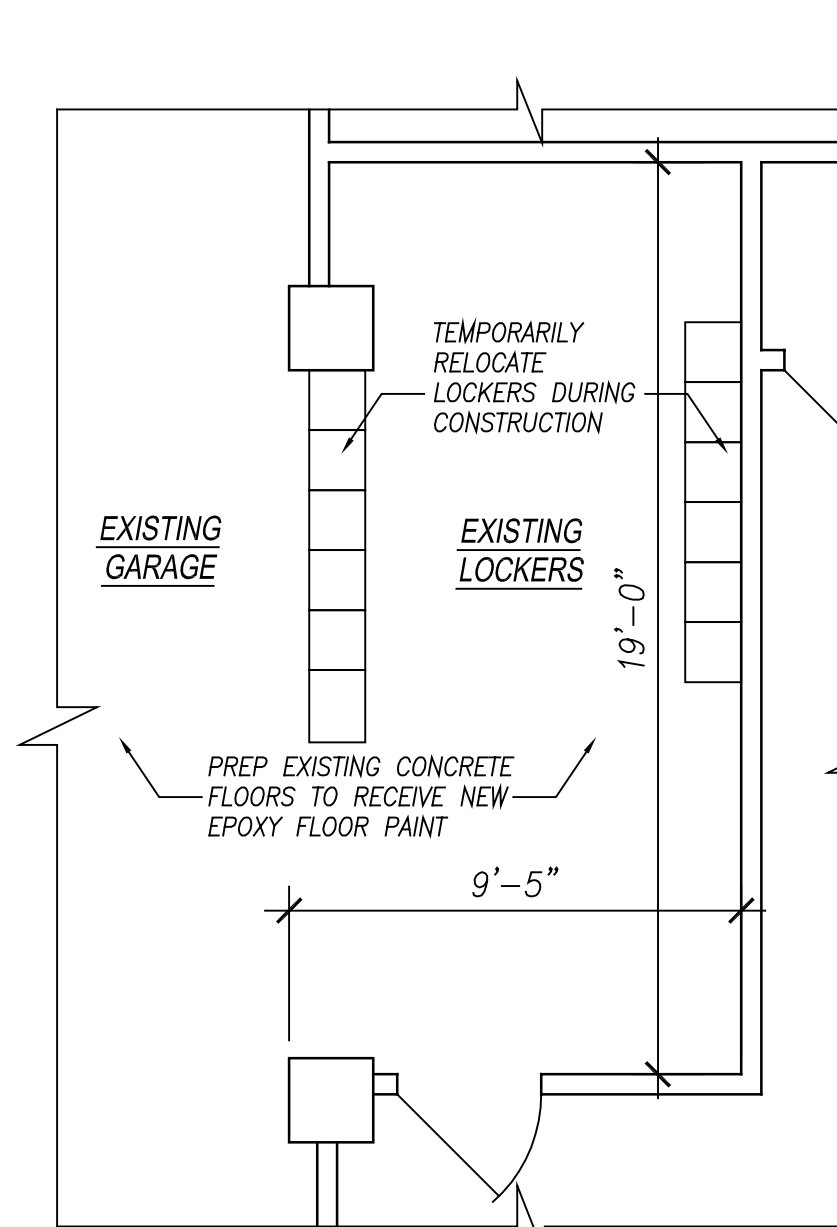
2 FIRST FLOOR KEY PLAN
SCALE: 1/32" = 1'-0"



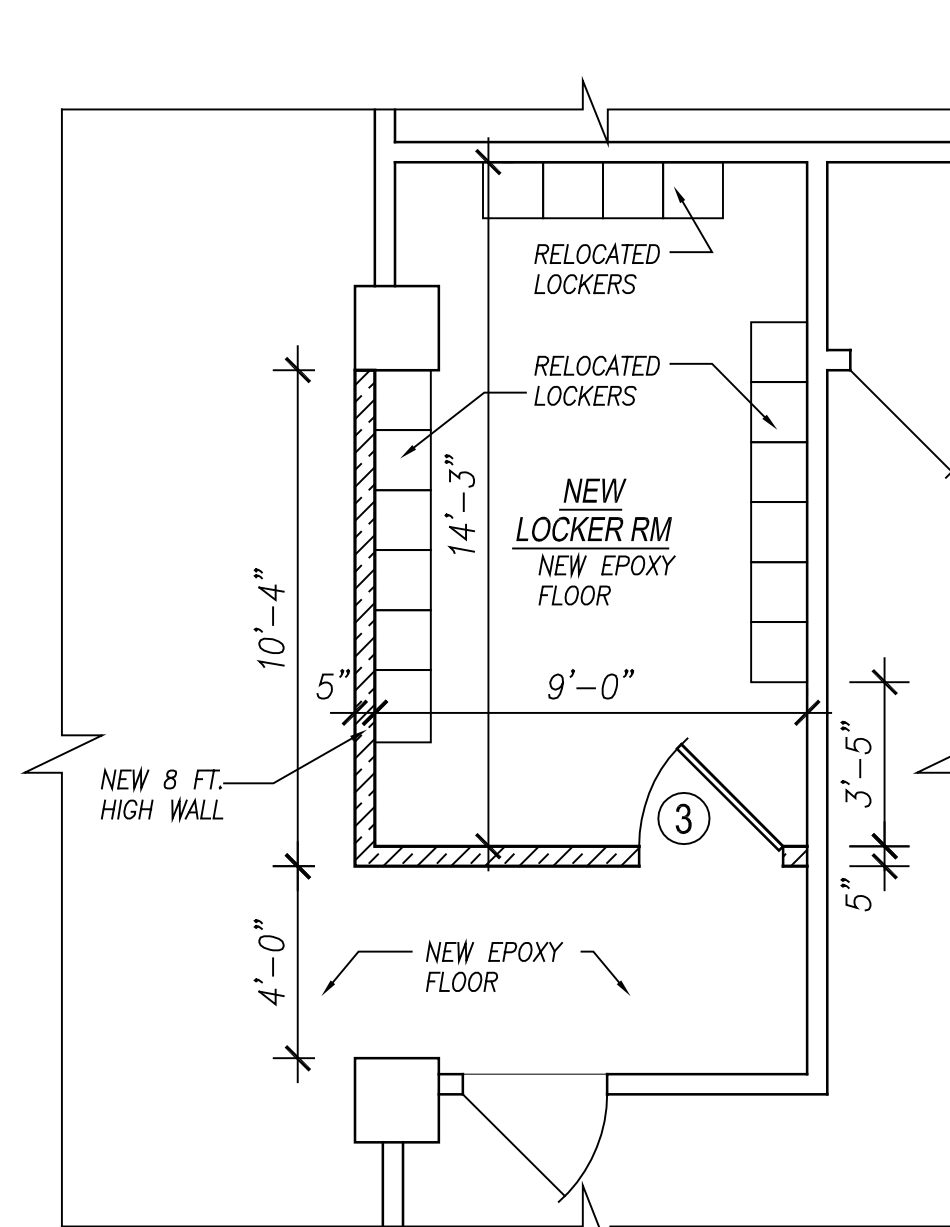
3 PARTIAL DEMO PLAN
SCALE: 1/4" = 1'-0"



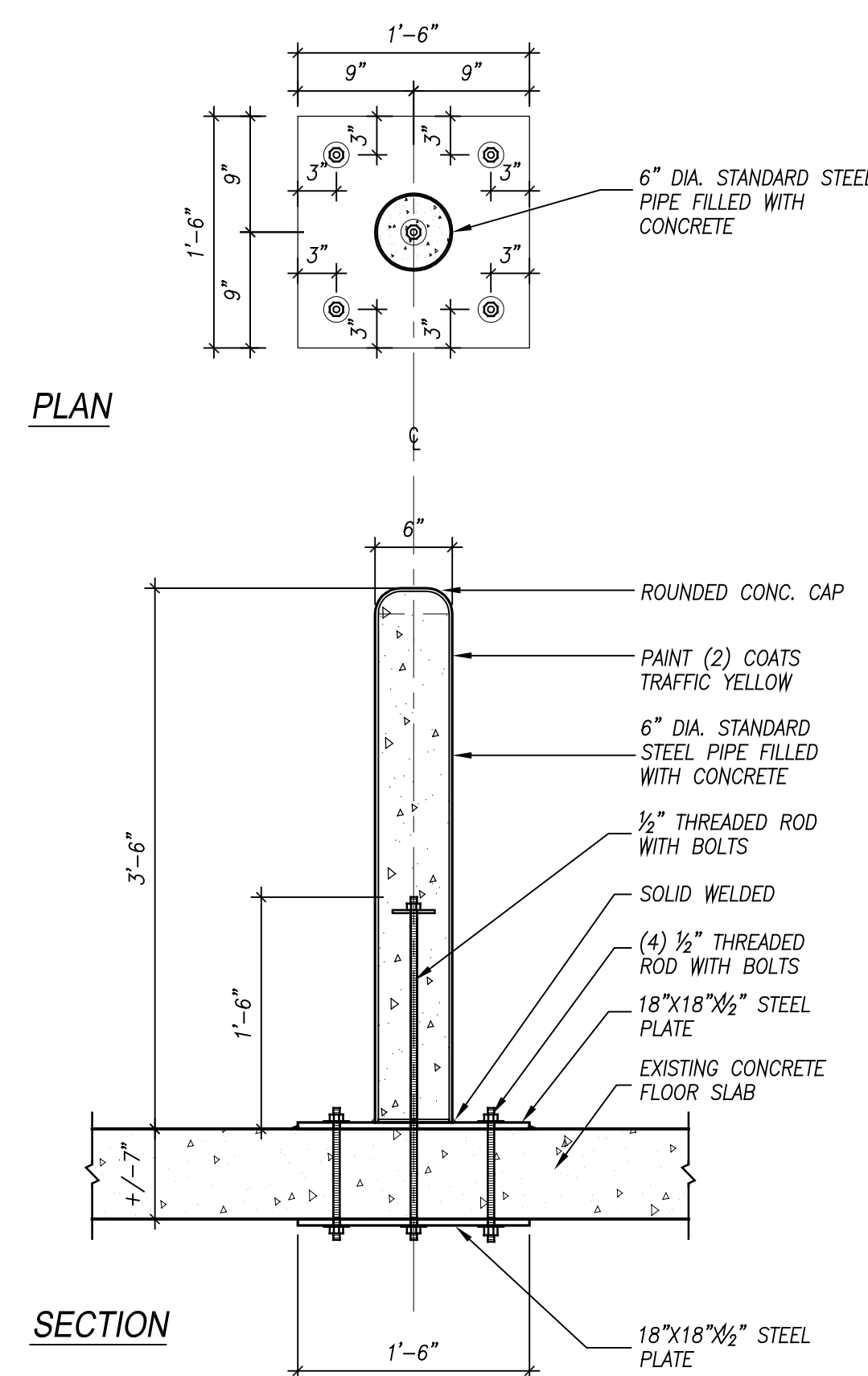
4 PARTIAL PLAN
SCALE: 1/4" = 1'-0"



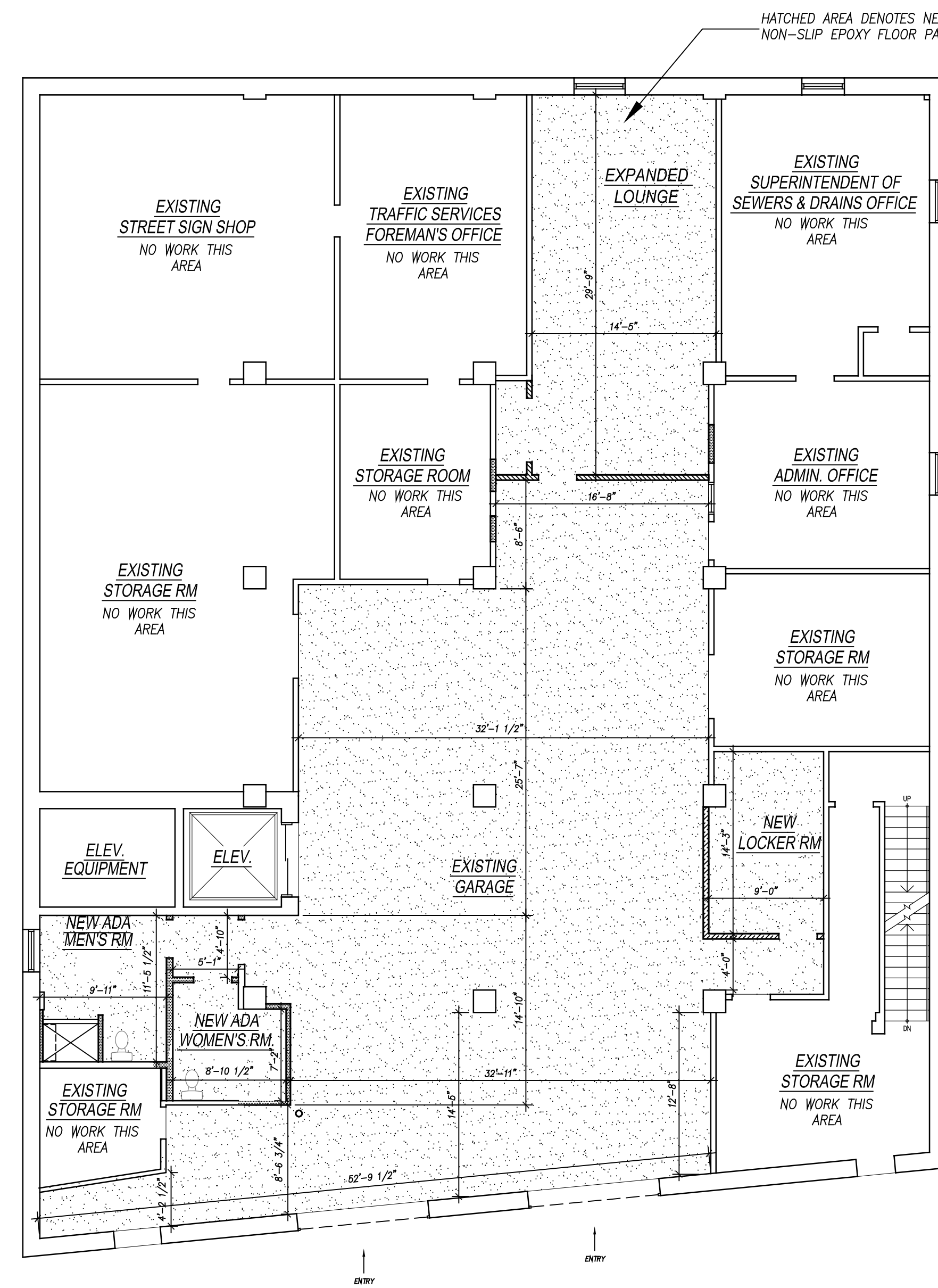
5 PARTIAL DEMO PLAN
SCALE: 1/4" = 1'-0"



6 PARTIAL PLAN
SCALE: 1/4" = 1'-0"



7 BOLLARD DETAIL
SCALE: 1" = 1'-0"



8 PARTIAL PLAN
SCALE: 1/8" = 1'-0"

NO. DATE REVISION

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element
Architectural Group

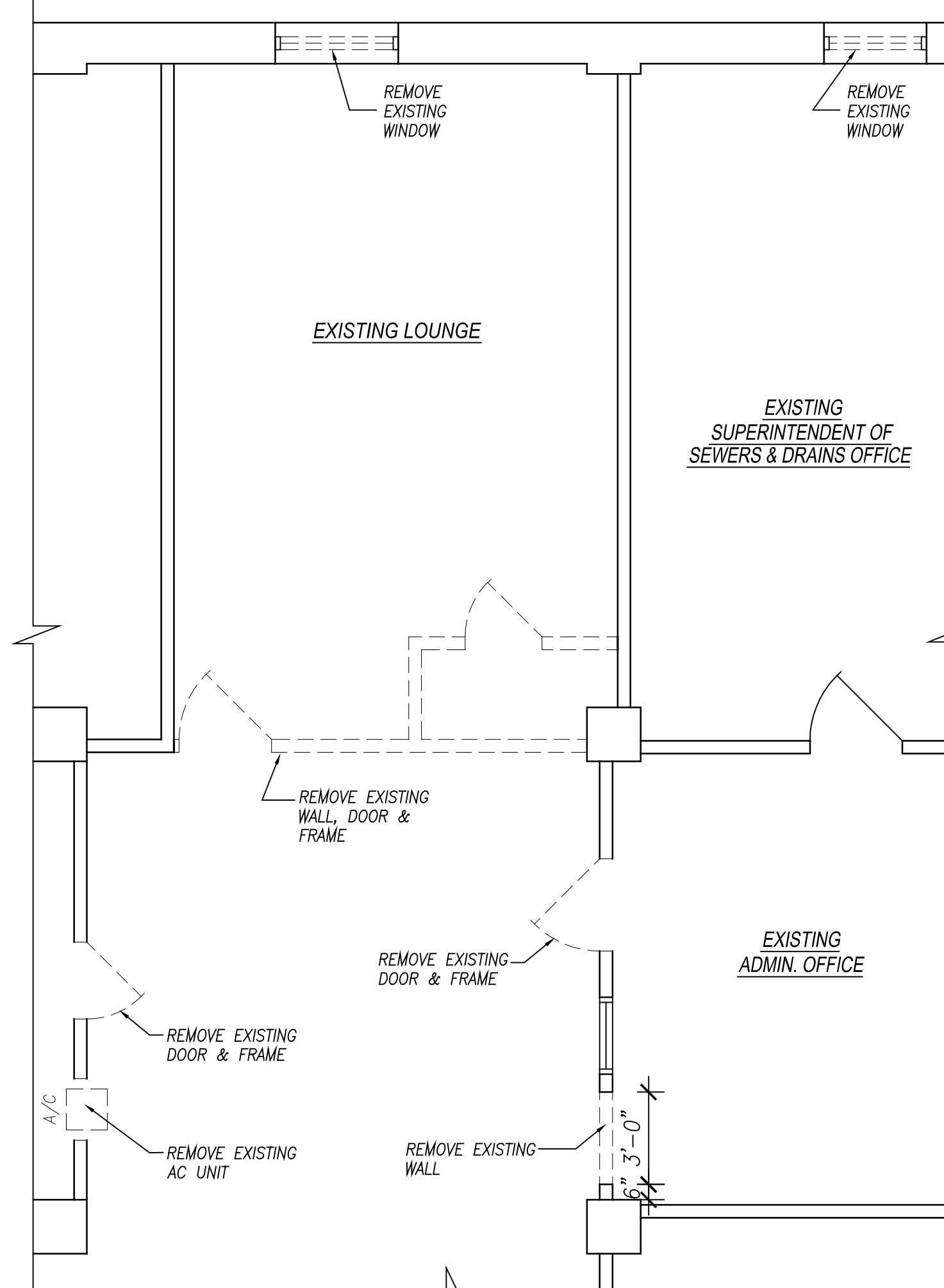
12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7758 NJ LIC. A012158; NY LIC. 024305

KEY PLANS, PARTIAL
DEMO PLANS AND
PARTIAL PLANS

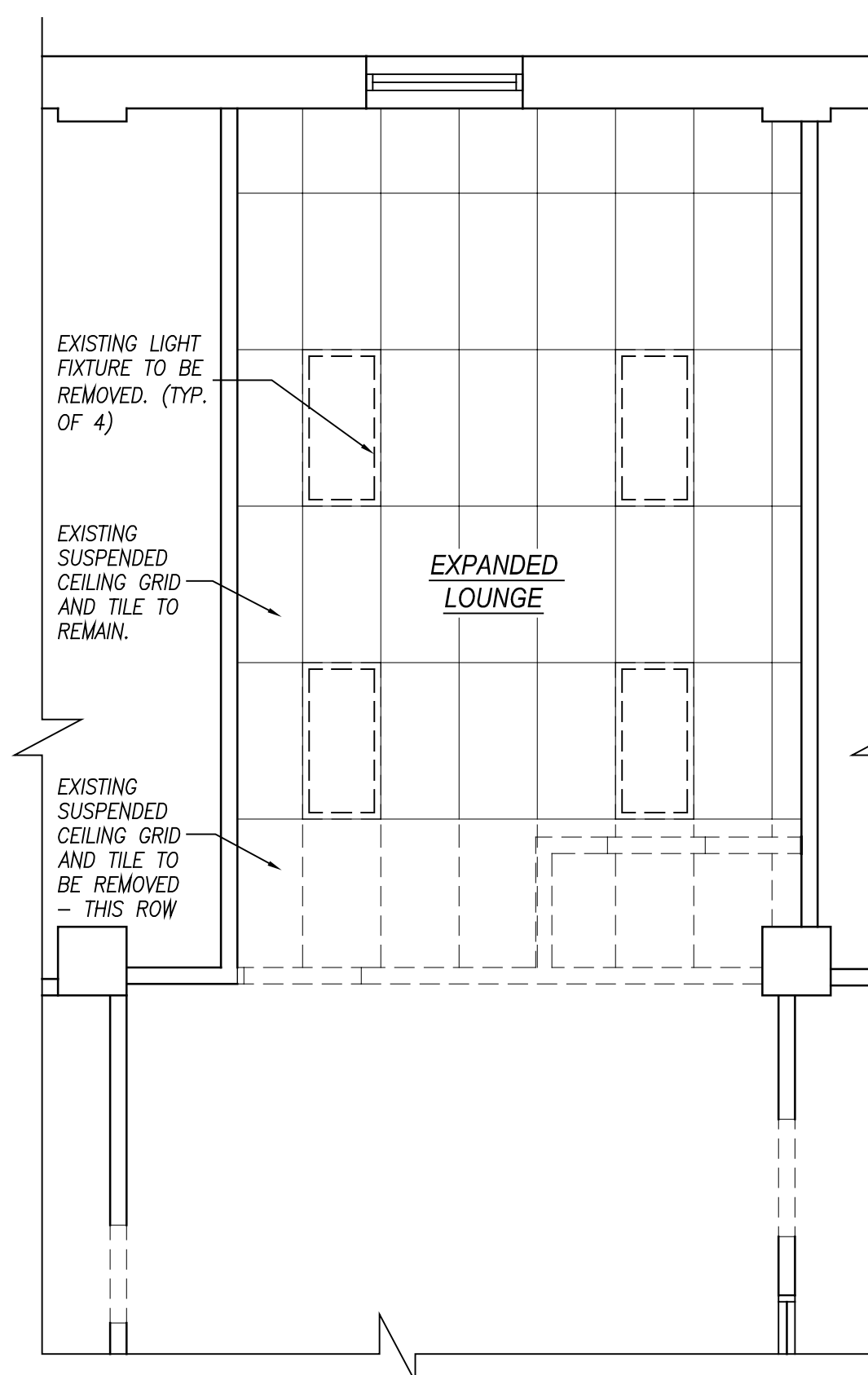
JOB: 2023-12
DATE: 10-6-23
SCALE: AS SHOWN
DWG: APK

A-101.00

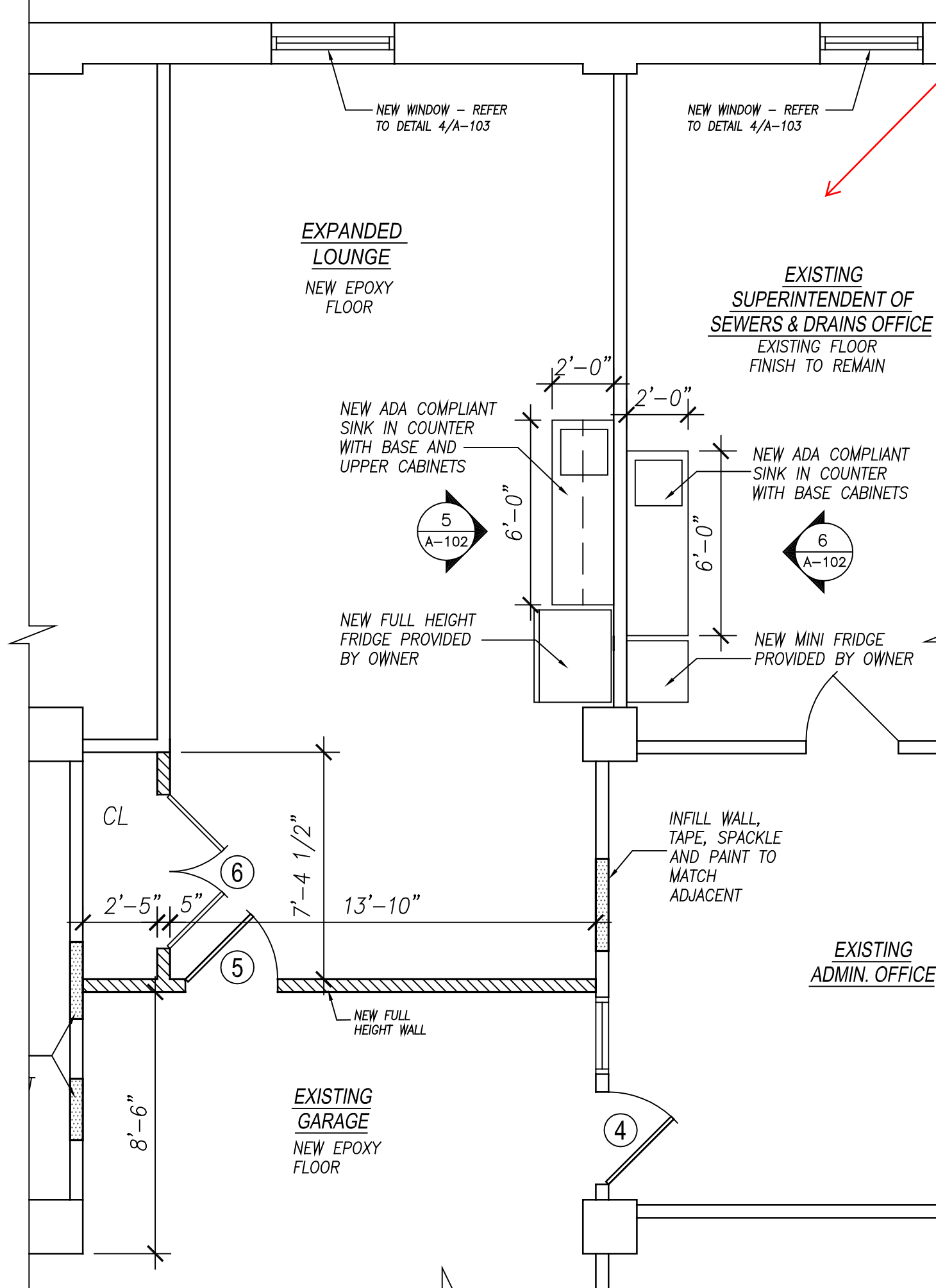
DWG. 2 OF 12



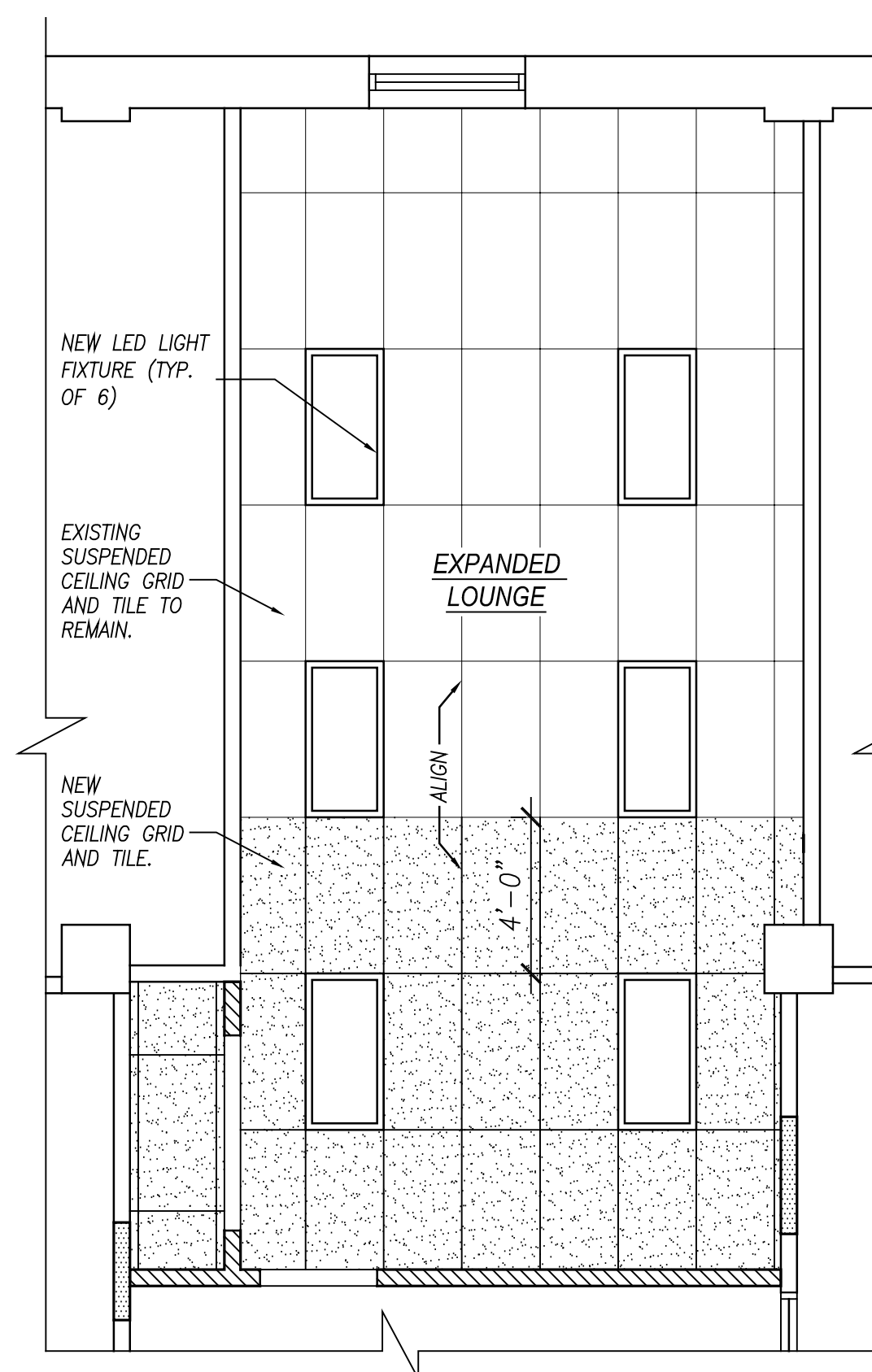
1 PARTIAL DEMO PLAN
SCALE: 1/4" = 1'-0"



3 PARTIAL DEMO REFL. CEILING PLAN
SCALE: 1/4" = 1'-0"

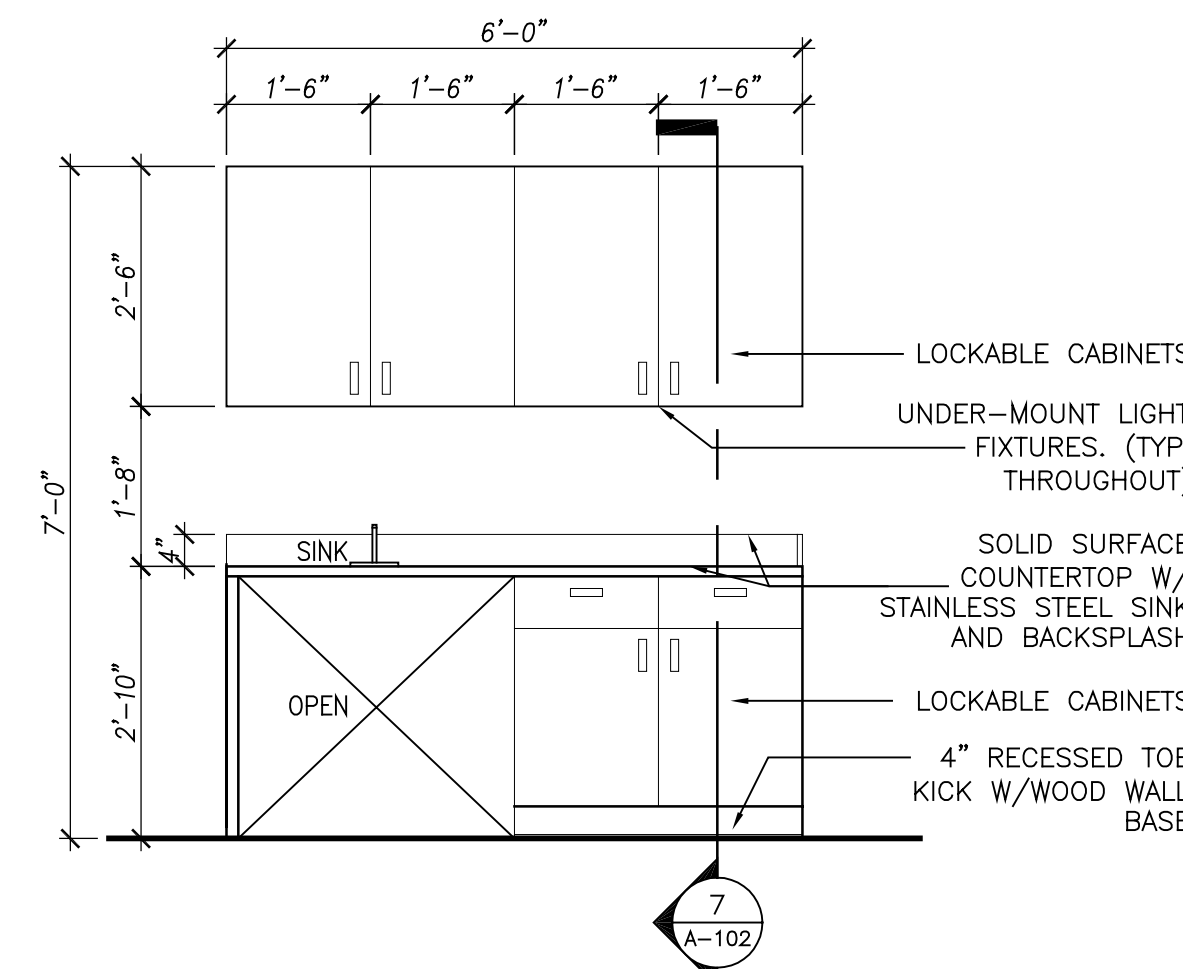


2 PARTIAL PLAN
SCALE: 1/4" = 1'-0"

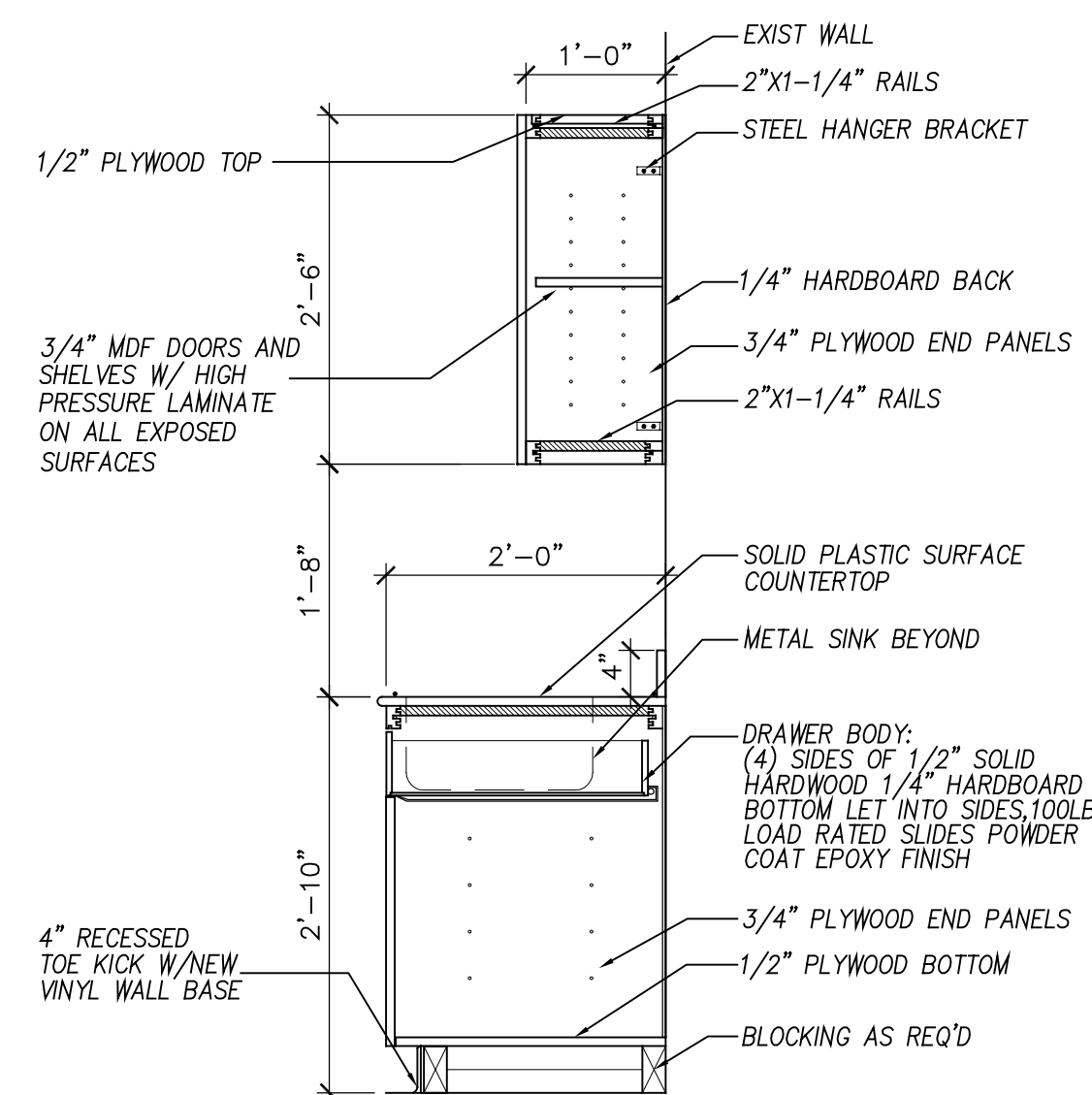


4 PARTIAL REFL. CEILING PLAN
SCALE: 1/4" = 1'-0"

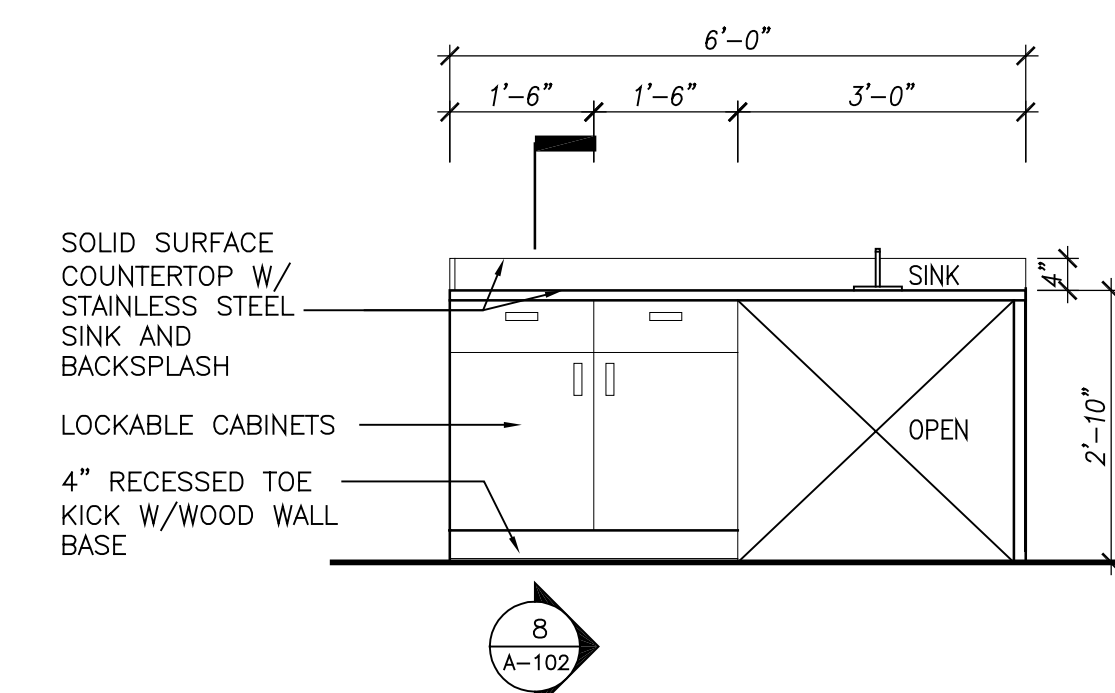
ALL WORK ASSOCIATED WITH THE EXISTING SUPERINTENDENT OF SEWER & DRAINS OFFICE TO BE PRICED SEPERATELY AS NOTED ON THE BID FORM



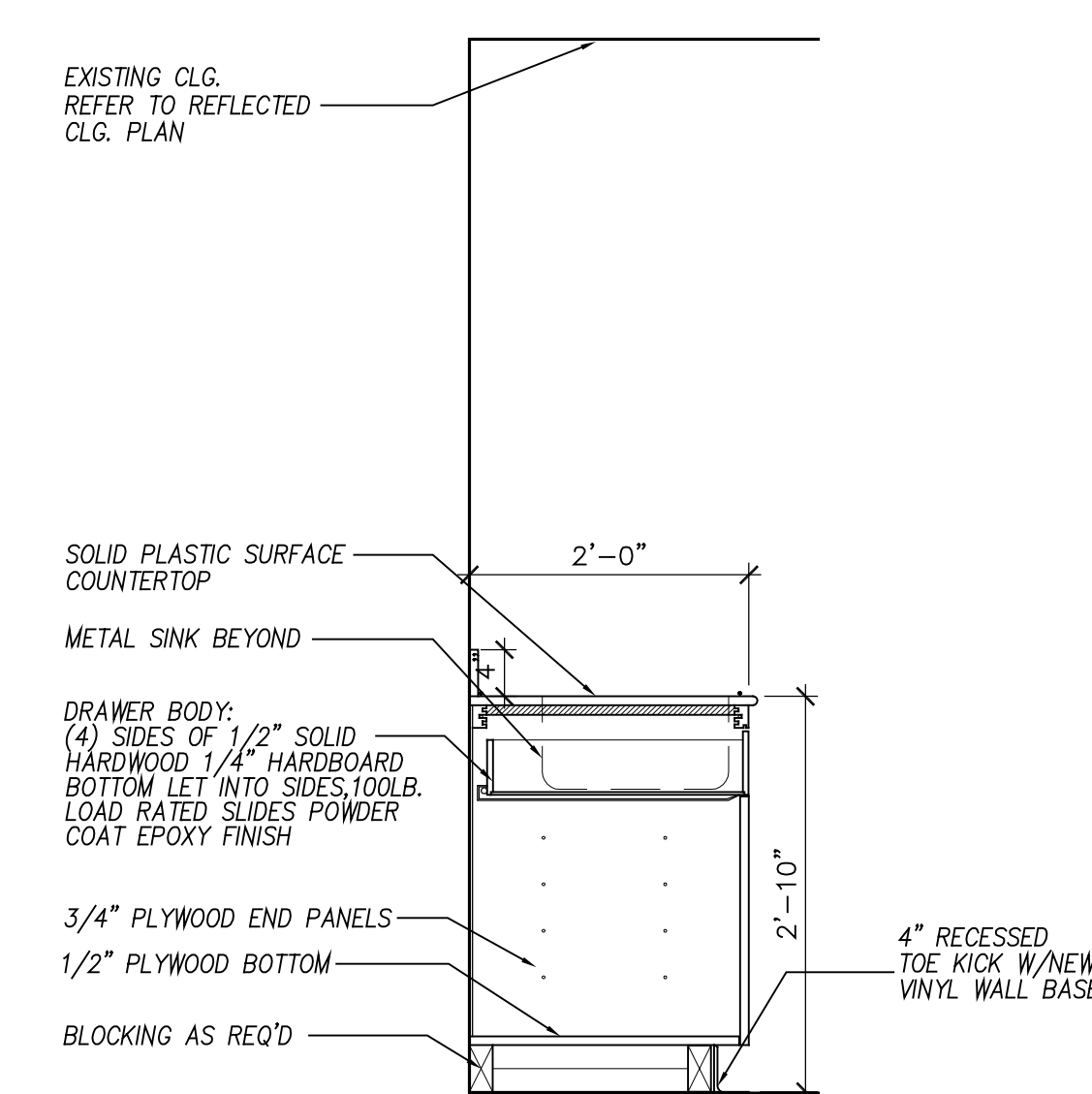
5 ELEVATION
SCALE: 1/2" = 1'-0"



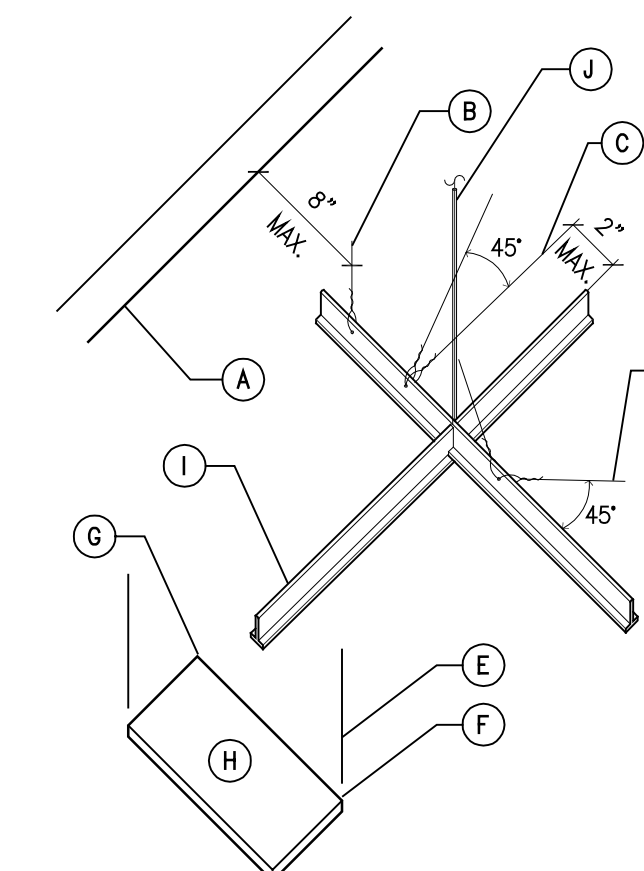
7 SECTION
SCALE: 3/4" = 1'-0"



6 ELEVATION
SCALE: 1/2" = 1'-0"



8 SECTION
SCALE: 3/4" = 1'-0"



5 SEISMIC BRACING
TYP. AT NEW DROPPED CEILING

- (A) WALL
- (B) ONE VERTICAL SUPPORT 8" FROM WALL 4'-0" APART.
- (C) TWO #2 SPLAY WIRES PERPENDICULAR TO MAIN RUNNER.
- (D) TWO #2 SPLAY WIRES AT 12" O.C. EACH WAY.
- (E) OVER 56 LBS. FIXTURE SUPPORT DIRECTLY TO STRUCTURE.
- (F) UNDER 56 LBS. FIXTURE PROVIDE (2) #2 SLACK WIRES PLUS ATTACH 4 CORNERS TO GRID.
- (G) CLIP 4 CORNERS.
- (H) LIGHT FIXTURE OR CEILING DIFFUSER.
- (I) CROSS TEE: HEAVY-DUTY SYSTEM OF GRID/RUNNERS (FOR INTERMEDIATE-DUTY SYSTEM ADDITIONAL WIRES NECESSARY TO RUNNERS 3' FROM ALL FIXTURE CORNERS). ICBO-ES 4071. BLDG. STDS. 25.2.0.
- (J) SEISMIC COMPRESSION STRUT: 12'-0" O.C. 1/2" RIGID STEEL CONDUIT TO BE PLACED OVER VERTICAL WIRE. CUT TUBE TO LENGTH LESS THAN OPEN SPACING. (IF REQUIRED BY LOCAL JURISDICTION).

NO. DATE REVISION

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element
Architectural Group

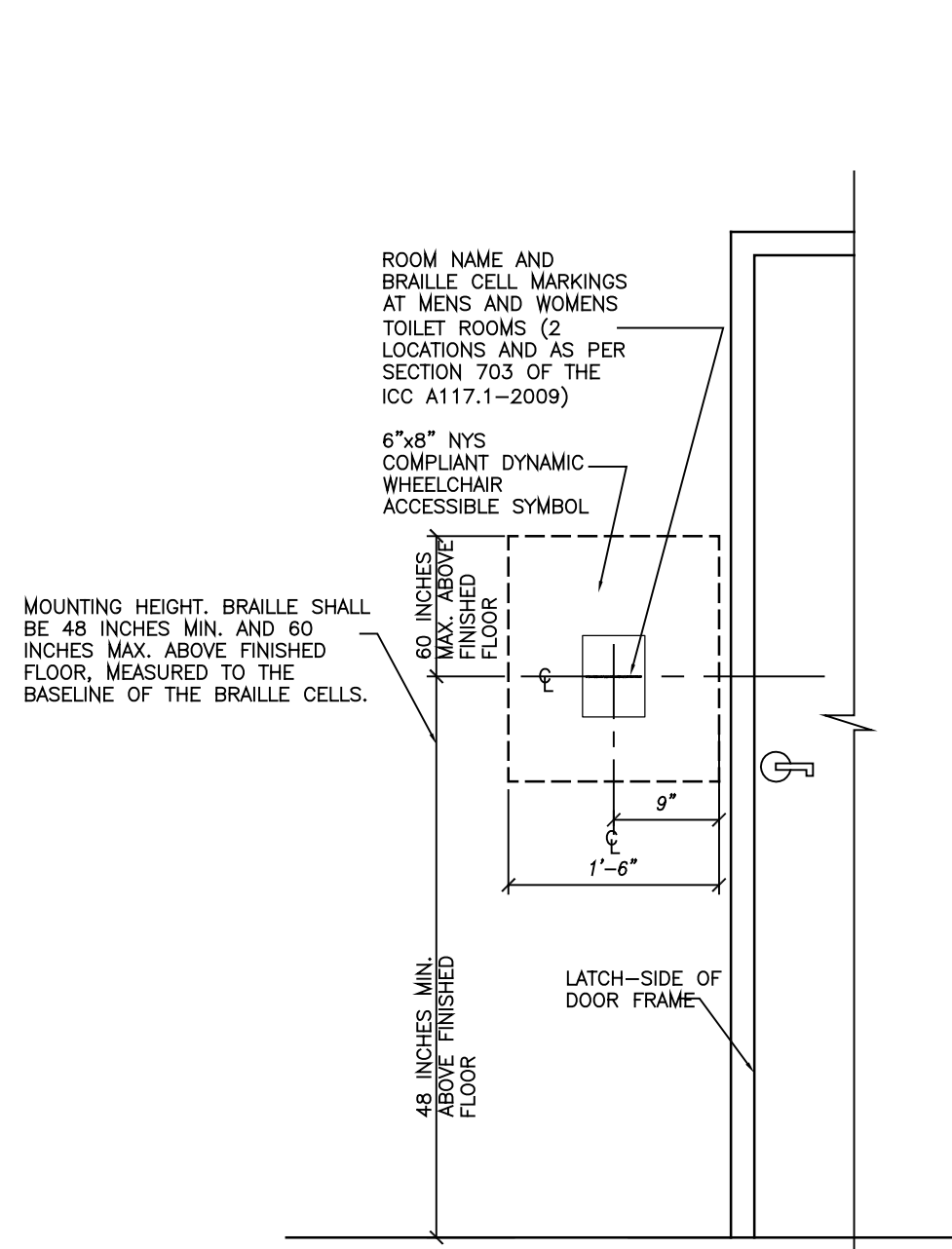
12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7758 NJ LIC. A012148; NY LIC. 024305

PARTIAL DEMO PLANS
PARTIAL PLANS AND
ELEVATIONS/SECTIONS

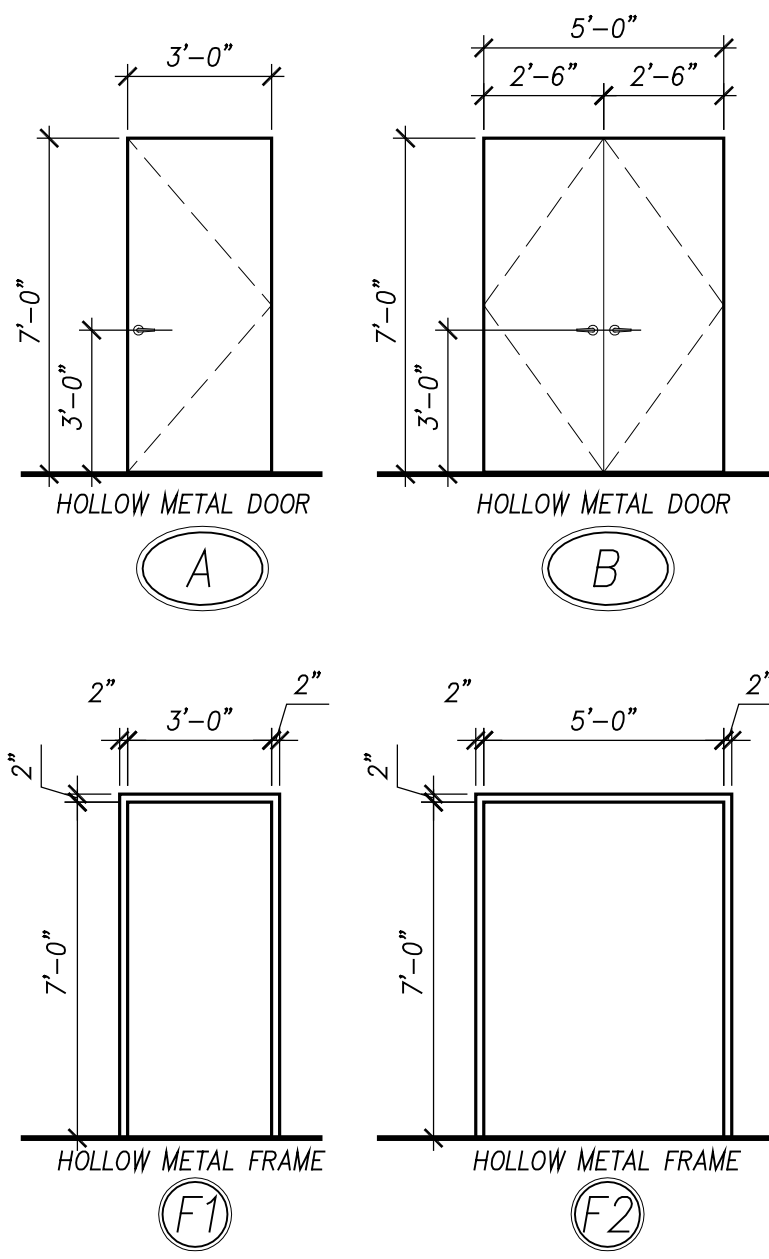
JOB: 2023-12
DATE: 10-6-23
SCALE: AS SHOWN
DWG: APK

A-102.00

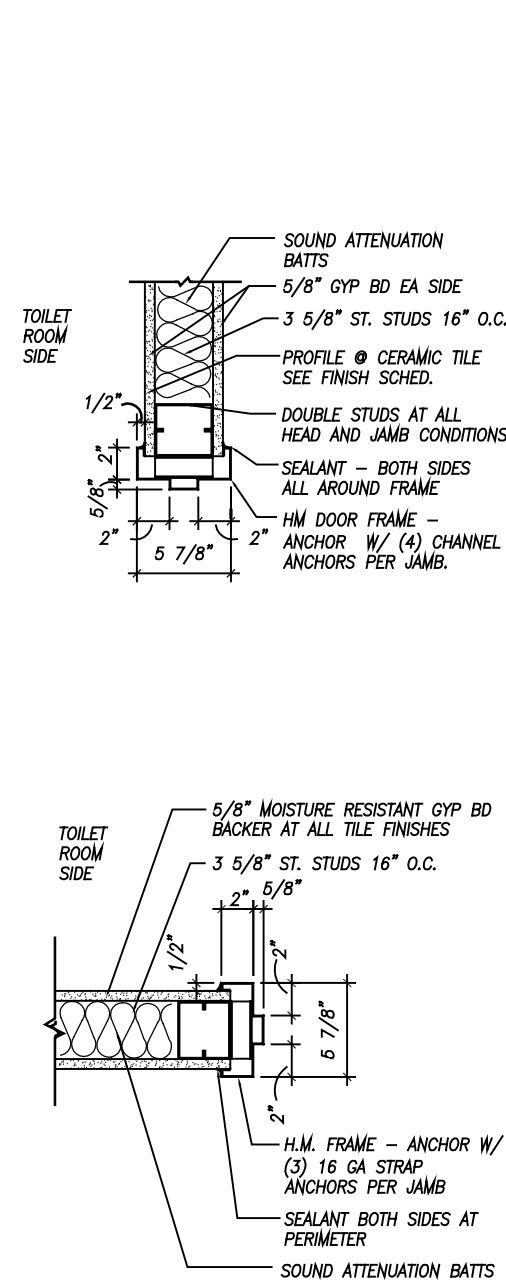
DWG. 3 OF 12



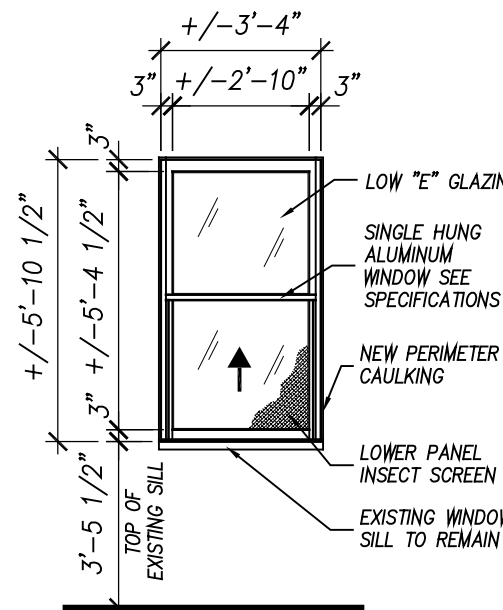
1 ADA SIGNAGE
SCALE: 3/4" = 1'-0"



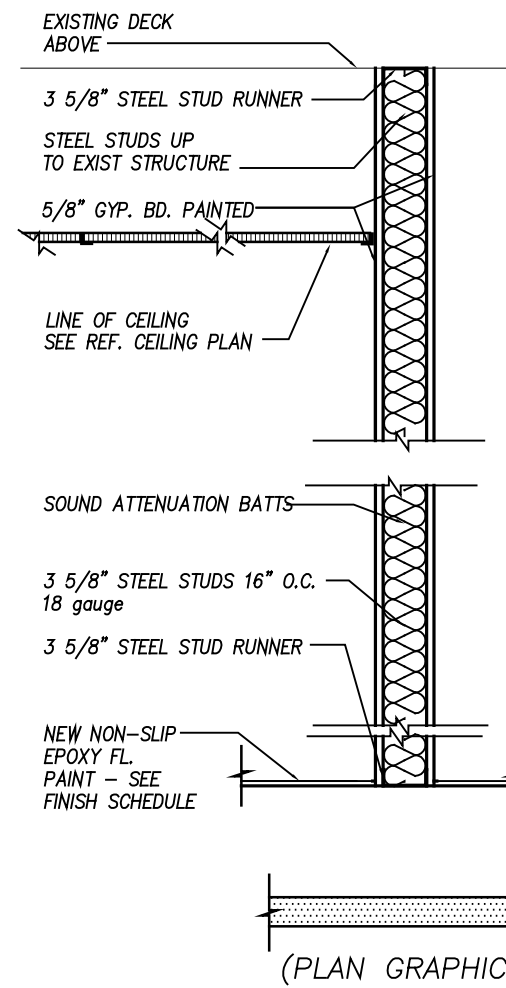
2 DOOR AND FRAMES
SCALE: 1/4" = 1'-0"



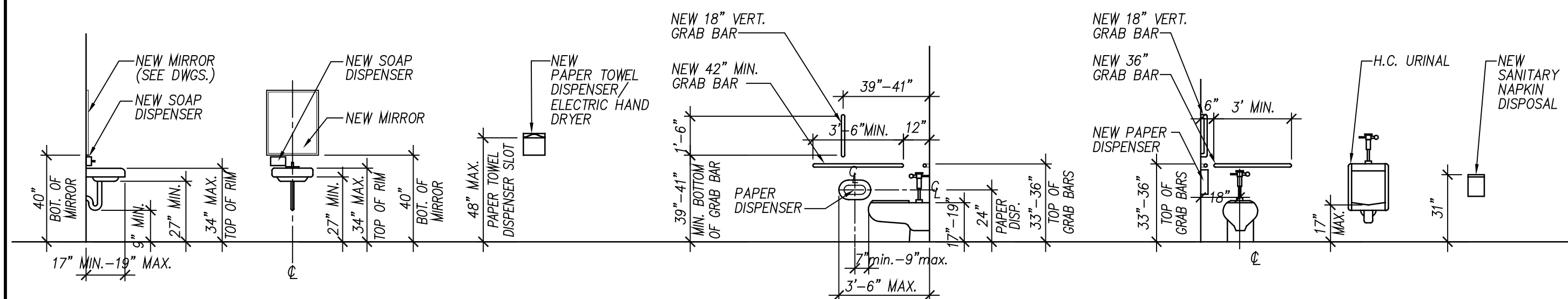
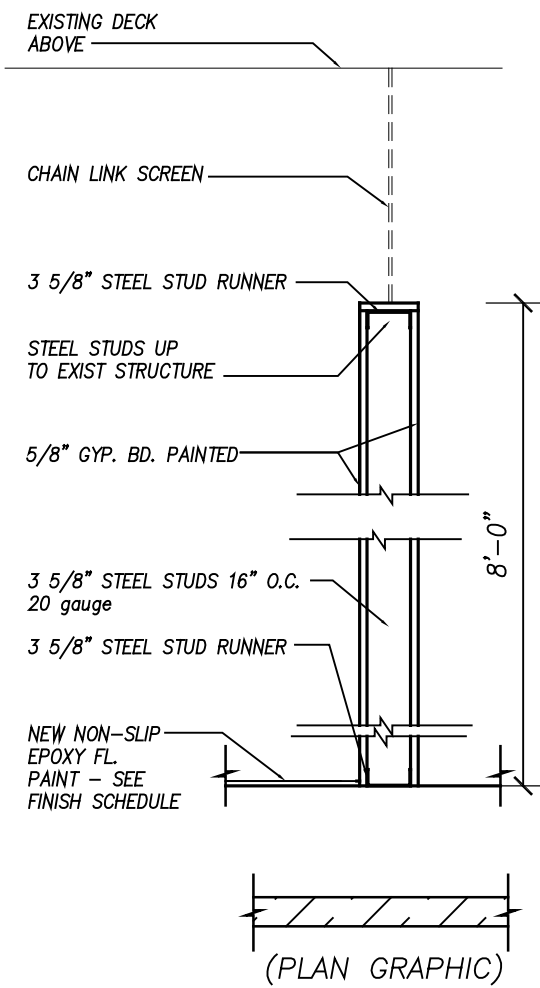
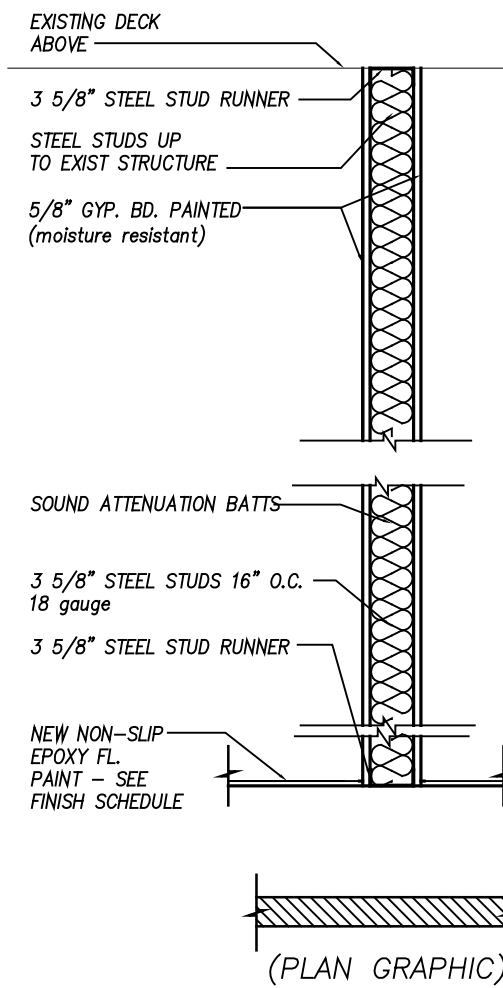
3 DOOR JAMB, HEAD & THRESHOLD
SCALE: 1" = 1'-0"



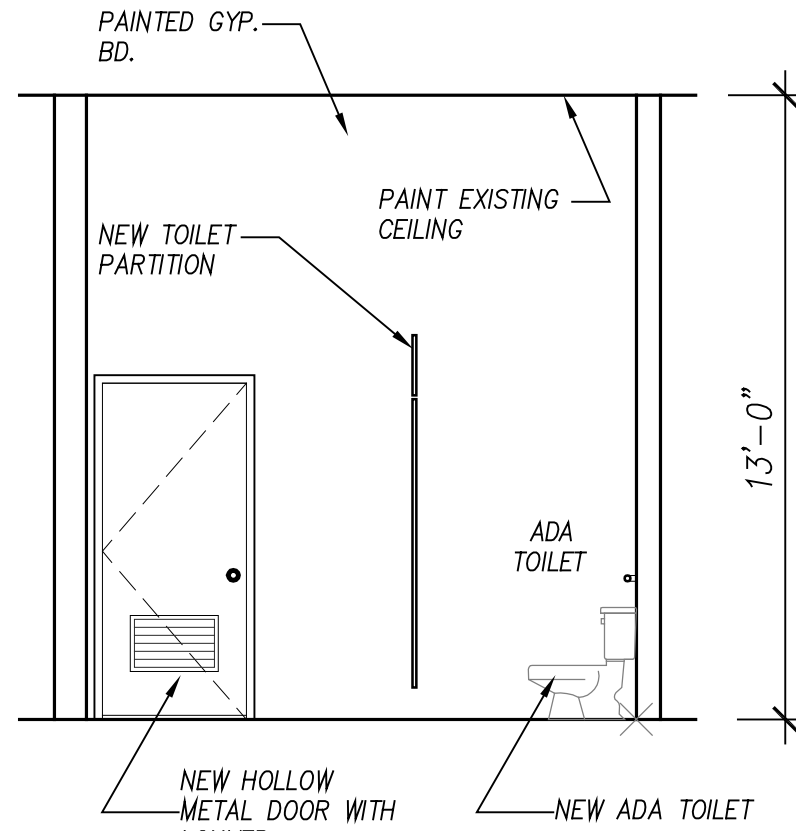
4 WINDOW ELEVATIONS
SCALE: 1/4" = 1'-0"



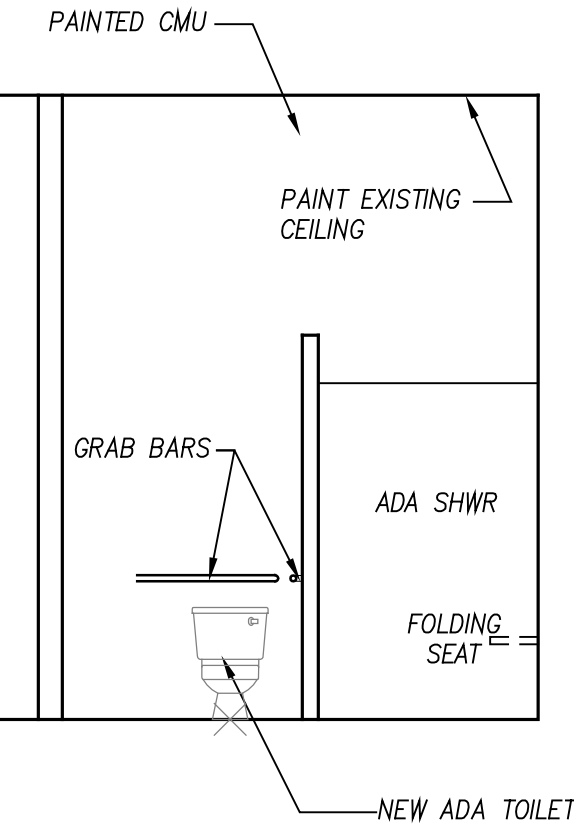
5 STEEL STUD WALL
SCALE: 3/4" = 1'-0"



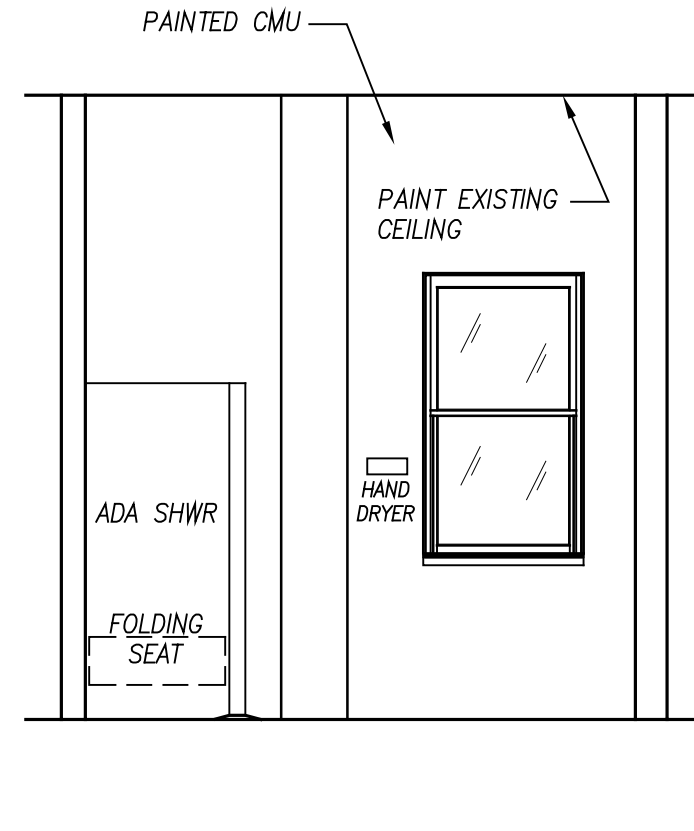
6 PLUMBING MOUNTING HEIGHTS
SCALE: 1/4" = 1'-0"



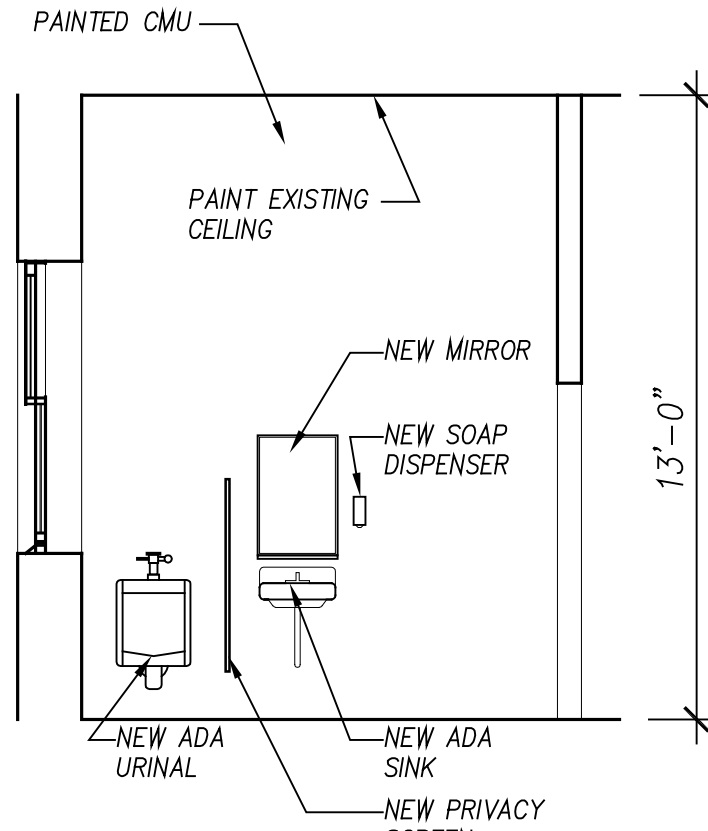
7 ELEVATION
SCALE: 1/4" = 1'-0"



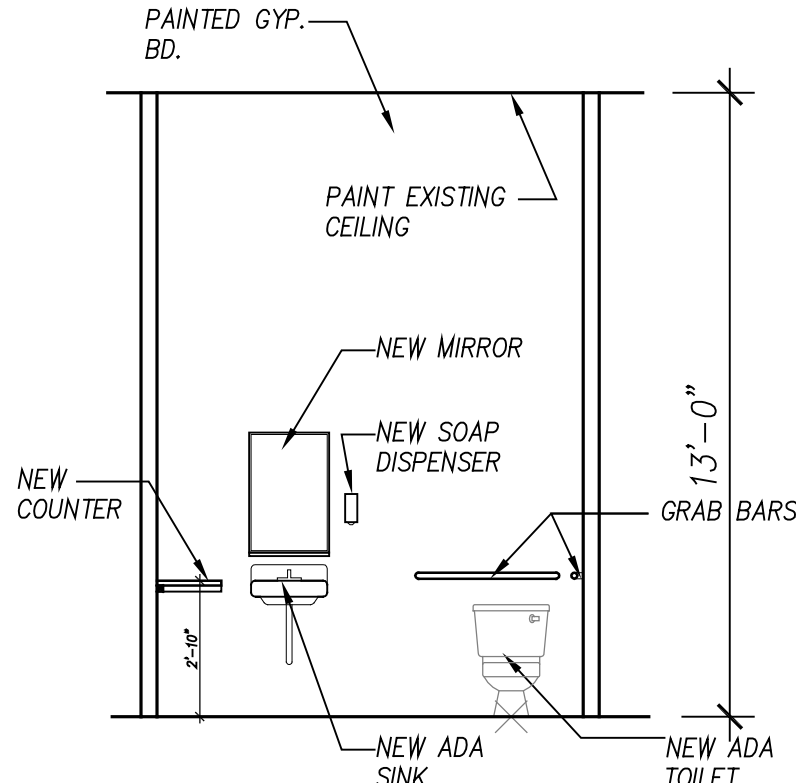
8 ELEVATION
SCALE: 1/4" = 1'-0"



9 ELEVATION
SCALE: 1/4" = 1'-0"



10 ELEVATION
SCALE: 1/4" = 1'-0"



11 ELEVATION
SCALE: 1/4" = 1'-0"

INTERIOR WORK AND FINISH SCHEDULE									
ROOM	FLOOR		BASE		WALLS		CEILING		REMARKS
	WORK ITEMS	NEW FINISH	WORK ITEMS	NEW FINISH	WORK ITEMS	NEW FINISH	WORK ITEMS	NEW FINISH	
DESCRIPTION	EXIST. CERAMIC TILE	EXIST. CONC. SLAB	REMOVE EXIST. CERAMIC TILE AND REPAIR SLAB		REMOVE EXIST. FINISH MATERIAL AND REPAIR SUBSTRATE		REMOVE EXIST. FINISH MATERIAL AND REPAIR SUBSTRATE		
NEW ADA MEN'S RM.	●	●	●	●	●	●	●	●	
NEW ADA WOMEN'S RM.	●	●	●	●	●	●	●	●	
NEW LOCKER ROOM	●	●	●	●	●	●	●	●	
EXISTING GARAGE	●	●	●	●	●	●	●	●	WALLS - LIMITED TO NEW OR MODIFIED
EXISTING STORAGE	●	●	●	●	●	●	●	●	WALLS - LIMITED TO NEW OR MODIFIED
EXISTING ADMIN. OFFICE	●	●	●	●	●	●	●	●	WALLS - LIMITED TO NEW OR MODIFIED
EXPANDED LOUNGE	●	●	●	●	●	●	●	●	

ACCESSORIES SCHEDULE		
ROOM	QTY.	REMARKS
DESCRIPTION		
NEW ADA MEN'S TOILET RM.	1	MANUAL OPERATION - SOAP, PAPER TOWEL
NEW ADA WOMEN'S TOILET RM.	1	MANUAL OPERATION - SOAP, PAPER TOWEL

DOOR SCHEDULE																				
NO.	FROM	TO	DOOR		VERIFY ALL DIMENSIONS IN FIELD		FRAME			SILL		HARDWARE							REMARKS	
			QTY.	SIZE	TYPE	MAT'L	TYPE	MAT'L	JAMB	HEAD	TYPE	LABEL	BRUITS	LATCH	CLASR	SSDL	KNOB	W/PLC		DOOR
1	GARAGE	NEW ADA MEN'S TOILET RM.	1	3'-0" x 7'-0"	A	H.M.	F1	H.M.	J2	H2	A		●	●	●	●	●	●	1	PROVIDE HANDICAPPED SIGNAGE
2	GARAGE	NEW ADA WOMEN'S TOILET RM.	1	3'-0" x 7'-0"	A	H.M.	F1	H.M.	J1	H1	A		●	●	●	●	●	●	2	PROVIDE HANDICAPPED SIGNAGE, COAT HOOK
3	GARAGE	NEW LOCKER ROOM	1	3'-0" x 7'-0"	A	H.M.	F1	H.M.	J1	H1	A		●	●	●	●	●	●	3	PROVIDE HANDICAPPED SIGNAGE
4	GARAGE	EXISTING ADMIN OFFICE	1	3'-0" x 7'-0"	A	H.M.	F1	H.M.	J1	H1	A		●	●	●	●	●	●	4	
5	GARAGE	EXPANDED LOUNGE	1	3'-0" x 7'-0"	A	H.M.	F1	H.M.	J1	H1	A		●	●	●	●	●	●	5	
6	CLOSET	EXPANDED LOUNGE	2	2'-6" x 7'-0"	B	H.M.	F2	H.M.	J1	H1	A		●	●	●	●	●	●	6	FLUSH BOLT LH LEAF

NO.	DATE	REVISION

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801







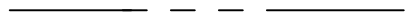















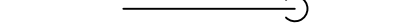









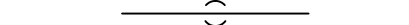




Element
Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7758 NJ LIC. A012148; NY LIC. 024305

ELEVATIONS, DETAILS
AND SCHEDULES

JOB:	2023-12
DATE:	10-6-23
SCALE:	AS SHOWN
DWN:	APK

PLUMBING SYMBOLS

	EXISTING WORK (LIGHT LINE)		SHOWER DRAIN
	NEW WORK (HEAVY LINE)		UNION
	COLD WATER (CW)		THERMOMETER
	HOT WATER (HW)		PRESSURE GAUGE WITH GAUGE COCK
	HOT WATER RECIRCULATION (HWR)		PIPE SLEEVE
	VENT PIPING		BALANCING VALVE (BV)
	EXISTING TO BE REMOVED		THERMOSTATIC MIXING VALVE
	NEW CONNECTION TO EXISTING		CLEAN OUT (CO)
	POINT OF DISCONNECTION		CAP OR PLUG
	FLOW-IN DIRECTION OF ARROW		STRAINER
	DROPPING DOWN PIPE		REDUCER/INCREASER
	RIISING UP PIPE		CLEAN OUT DECK PLATE (CODP)
	BOTTOM CONNECTION		AQUASTAT
	PIPE TOP CONNECTION		WATER RISER NO.
	OS & Y GATE VALVE		STACK NO.
	GATE VALVE		VENT STACK
	CHECK VALVE		LEADER NO.
	HWR BALANCING VALVE (HWRBV)		GLOBE ANGLE VALVE
	REDUCED PRESSURE ZONE BACKFLOW PREVENTER (RPZ)		

NOTE: NOT ALL USED

PLUMBING AND DRAINAGE ABBREVIATIONS:

AC	AIR CHAMBER	HP	HIGH PRESSURE
AD	AREA DRAIN	HW	HOT WATER
AFF	ABOVE FINISHED FLOOR	HWC	HOT WATER CIRCULATION
AWD	AREA WAY DRAIN	HWR	HOT WATER RETURN
BDV	BALL DRIP VALVE	INCR	INCREASER
BFP	BACK FLOW PREVENTER	IND W	INDIRECT WASTE
BOT	BOTTOM	INS	INSULATION
BR VENT	BRANCH VENT	INV	INVERT ELEVATION
BWV	BACK WATER VALVE	IPS	IRON PIPE SIZE
CB	CATCH BASIN	LG	LEGAL GRADE ELEVATION
CFS	CUBIC FEET/SECOND	LP	LOW PRESSURE
CI	CAST IRON	MAX	MAXIMUM
CK VA	CHECK VALVE	MH	MANHOLE
C _c OR CL	CENTER LINE	MIN	MINIMUM
CLG	CEILING	MOCV	METER OUTLET CONTROL VALVE
CNCL FV	CONCEALED FLUSH VALVE	MU	MAKE UP WATER
CODP	CLEANOUT DECK PLATE	NC	NEW CONNECTION
COL	COLUMN	NIC	NOT IN CONTRACT
CONC	CONCRETE	NPS	NOMINAL PIPE SIZE
CONN	CONNECTION	OS&Y	OUTSIDE SCREW & YOKE
CONT	CONTINUED	PART	PARTITION
CU FT	CUBIC FEET	PD	PUMP DISCHARGE
CV	CONTROL VALVE	P&D	PLUMBING AND DRAINAGE
CW	COLD WATER	PG	PRESSURE GAUGE
DET	DETAIL	PRESS	PRESSURE
DIA	DIAMETER	PRV	PRESSURE RELIEF VALVE
DN	PIPE DOWN THRU FLOOR	RD	ROOF DRAIN
DR	DRAIN	RED	REDUCER
DRB	DRAIN BIBB	RISE	PIPE RISING BETWEEN FLOORS
DROP	PIPE DROPPING BETWEEN FLOORS	RM	ROOM
DWG	DRAWING	RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
EL	ELEVATION	SAN	SANITARY
EXIST	EXISTING	SL V	SLEEVE
F	FALL(IN,FT)	SPEC	SPECIFICATIONS
FAI	FRESH AIR INLET	SQ FT	SQUARE FEET
FD	FLOOR DRAIN	ST	STACK
FIN FL	FINISHED FLOOR	STD	STANDARD
FL	FLOOR	STR	STRAINER
G	GAS	TH	THERMOMETER
GA	GAUGE	TR	TRAP
GAL	GALLON	TYP	TYPICAL
GALV	GALVANIZED	UP	PIPE RISING THRU FLOOR
GC	GENERAL CONTRACTOR	V	VENT
GPM	GALLON PER MINUTE	VA	VALVE
GV	GATE VALVE	VTR	VENT THRU ROOF
HB	HOSE BIBB	WASTE	WASTE
HC	HUNG CEILING	WCO	WALL CLEANOUT
HDR	HEADER		

NOTE: NOT ALL USED

GENERAL NOTES:

- THE PLUMBING WORK SHALL BE IN FULL COMPLIANCE WITH THE 2022 NYS BUILDING CODE AND ADAPTED APPENDICES, LOCAL PLUMBING CODES AND ALL AUTHORITIES HAVING JURISDICTION.
- PROVIDE LABOR, MATERIALS, TOOLS, MACHINERY, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE THE WORK UNDER THIS CONTRACT. ALL SYSTEMS AND EQUIPMENT SHALL BE COMPLETE IN EVERY ASPECT AND ALL ITEMS OF MATERIAL, EQUIPMENT AND LABOR SHALL BE PROVIDED FOR A FULLY OPERATIONAL SYSTEM AND READY FOR USE. COORDINATE THE WORK WITH THE WORK OF THE OTHER TRADES IN ORDER TO RESOLVE ALL CONFLICTS WITHOUT IMPEDING THE JOB PROGRESS.
- EXAMINE THE DRAWINGS AND OTHER DIVISIONS, AND SECTIONS OF THE SPECIFICATIONS IN ORDER TO DETERMINE THE EXTENT OF THE WORK REQUIRED TO BE COMPLETED UNDER THIS DIVISION. FAILURE TO EXAMINE ALL THE CONTRACT DOCUMENTS FOR THIS PROJECT WILL NOT RELIEVE THIS SECTION AND ANY OTHER SECTIONS OF THEIR RESPONSIBILITIES TO PERFORM THE WORK REQUIRED FOR A COMPLETE FULLY OPERATIONAL AND SATISFACTORY INSTALLATION.
- THE WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING SYSTEMS, EQUIPMENT AND SERVICES, AS SPECIFIED HEREBY. START-UP SERVICES SHALL BE INCLUDED IN THE BID.
- ALL SYSTEMS, EQUIPMENT AND SERVICES SPECIFIED HEREIN SHALL BE PROVIDED COMPLETE AND READY FOR USE. ALL EQUIPMENT, PIPING, ARE NEW, FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE NOTED.
- INSTALL ACCESS FOR SERVICING AND MAINTENANCE. COORDINATE THE FINAL LOCATION OF CONCEALED EQUIPMENT AND DEVICES REQUIRING ACCESS WITH FINAL LOCATION OF ACCESS PANELS AND DOORS. ALLOW AMPLE SPACE FOR REMOVAL OF ALL PARTS THAT REQUIRE REPLACEMENT OR SERVICING.
- VERIFY FINAL LOCATIONS FOR ROUGH WORK WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING CONNECTED.
- PIPING ARE SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISERS OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER AND ALL COMPONENTS TO ALLOW FOR INSTALLATIONS.
- COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SIZE OF SLEEVES TO BE SET IN POURED CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED.
- COORDINATE THE INSTALLATION OF MATERIALS AND EQUIPMENT ABOVE GRADE WITH MECHANICAL AND SUPPRESSION SYSTEM, LIGHT FIXTURES, AND ALL OTHER INSTALLATIONS AND ACCESSORIES.
- PROVIDE EQUIPMENT AND SYSTEMS THAT, AS DEFINED HEREIN, SHALL BE QUIET AND FREE OF APPARENT VIBRATION IN OPERATIONS.
- OBTAIN EQUIPMENT THAT IS QUIET IN OPERATION AS COMPARED TO OTHER AVAILABLE EQUIPMENT OF ITS SIZE, CAPACITY, AND TYPE; INSTALL EQUIPMENT SO THAT A MINIMUM AMOUNT OF NOISE AND/OR VIBRATION IS TRANSMITTED TO THE BUILDING; AND FABRICATE THE DUCT SYSTEM SO THAT AIR NOISES GENERATED IN THE SYSTEM ARE HELD TO AN ABSOLUTE MINIMUM.
- PROVIDE A COMPLETE SYSTEM OF VIBRATION ISOLATION FOR EACH ITEM OF HVAC EQUIPMENT AND APPARATUS AS SPECIFIED HEREIN, AS SHOWN ON THE DRAWINGS AND AS NEEDED FOR A COMPLETE AND PROPER INSTALLATION.
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES INVOLVING EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACE AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER IN THE INTERIOR OR THE EXTERIOR.
- SEAL OPENINGS AROUND PIPING THROUGH PARTITIONS, AND WALLS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.
- ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- CONTRACTOR TO SUBMIT SHOP DRAWING FOR APPROVAL FOR ALL SYSTEMS.
- PRESSURE TEST WATER SUPPLY SYSTEM 1 1/2 TIMES WORKING PRESSURE FOR 2 HR MIN.

GENERAL DEMOLITION NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEMOLITION OF ALL MATERIALS, PIPING, AND APPURTENANCES AS DEPICTED ON THE DEMOLITION DRAWINGS. ADDITIONALLY THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE DEMOLITION OF ANY ADDITIONAL MATERIALS, EQUIPMENT, PIPING ETC. NOT COMPLETELY SHOWN ON THE DEMOLITION DRAWINGS THAT MAKE UP OR ARE AN APPURTENANCE OR COMPONENT OR THE MAJOR EQUIPMENT, SYSTEM, PIPING, ETC. DESIGNATED TO BE DEMOLISHED. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT.
- ALL PIPING AND APPURTENANCES DEPICTED ON THE DEMOLITION DRAWINGS THAT ARE NOT PART OF THE ACTUAL DEMOLITION WORK ARE SHOWN FOR REFERENCE ONLY. THE CONTRACTOR SHALL VERIFY ALL DEMOLITION WORK IN THE FIELD PRIOR COMMENCEMENT OF DEMOLITION, AND REPORT ANY AND ALL DISCREPANCIES TO THE SITE CONSTRUCTION MANAGER
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OR TEMPORARY STORAGE OF ALL EQUIPMENT, PIPING, COMPONENTS AND APPURTENANCES OF ALL DEMOLISHED MATERIALS. THE CONTRACTOR WILL OBTAIN THE OWNER'S PERMISSION IN WRITING PRIOR TO DISPOSING OF ANY SALVAGEABLE MATERIALS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL PERMITS REQUIRED FOR REMOVAL AND/OR STORAGE OF THE DEMOLISHED MATERIALS (INCLUDING ALL HAZARDOUS MATERIALS). ALL DEBRIS SHALL BE LEGALLY DISPOSED. THE CONTRACTOR WILL PROVIDE ALL DEMOLITION CONTAINERS AND DUMPSTERS AS REQUIRED. THE CONTRACTOR SHALL DETERMINE THE SEQUENCE OF REMOVAL, MEANS OF EQUIPMENT EGRESS, AS WELL TEMPORARY LAY DOWN AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ERECTION OF ALL TEMPORARY SCAFFOLDING, DUNNAGE STEEL, SUPPORTS, MATERIAL CHUTES, AND TEMPORARY ELECTRICAL AND WATER SERVICES AS REQUIRED TO PERFORM THE DEMOLITION WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO ERECT ALL BARRIERS, BRACING, DUSTPROOF PARTITIONS, FENCES AND WARNINGS SIGNS AS REQUIRED TO ENSURE THE SAFETY AND PREVENT INJURY AND INCONVENIENCE TO THE GENERAL PUBLIC.
- CONTRACTOR SHALL MAINTAIN THE CONSTRUCTION AREA IN A CLEAN AND ORDERLY CONDITION WITH DAILY REMOVAL OF ALL DEBRIS. NO DEBRIS SHALL BE ALLOWED TO ACCUMULATE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING EQUIPMENT, PIPING, COMPONENTS, ETC. NOT DESIGNATED FOR DEMOLITION.
- DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
- NO DEAD ENDS SHALL BE LEFT ON ANY PIPING UPON COMPLETION OF THE PROJECT.

GENERAL INSTALLATION NOTES:

- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK. PLUMBING CONTRACTOR SHALL COORDINATE ALL WORK WITH RESPECT TO OTHER TRADES, STRUCTURAL ELEMENTS, AND ARCHITECTURAL LAYOUTS, INCLUDING CEILING HEIGHTS. DO NOT SCALE DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND JOB CONDITIONS AND SHALL REPORT TO ENGINEER ANY DISCREPANCIES OR OMISSIONS THAT WOULD INTERFERE WITH SATISFACTORY COMPLETION OF THE WORK.
- UNLESS SPECIFICALLY STATED OTHERWISE, CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, APPURTENANCES, EQUIPMENT AND SERVICES TO COMPLETE ALL WORK AS INDICATED ON DRAWINGS AND/OR SPECIFIED ON NOTES.
- WORK IS NOT SHOWN IN FINITE DETAIL BUT IS INTENDED TO INCLUDE ITEMS NECESSARY FOR COMPLETION AND PROPER OPERATION.
- PROVIDE REQUIRED SUPPORTS AND HANGERS FOR PIPING, FIXTURES AND EQUIPMENT, SO LOADING WILL NOT EXCEED ALLOWABLE LOADINGS.
- ALL SYSTEMS SHALL BE LEFT IN PERFECT WORKING ORDER UPON COMPLETION OF ALL NEW WORK.
- FIXTURES (GENERAL): TO COMPLETE WITH TRIMMINGS AND FITTINGS, INCLUDING FAUCETS, SUPPLIES, STOPS, TRAPS, TAILPIECES, WASTE PLUGS, CASINGS, HANGERS, PLATES, BRACKETS, ANCHORS, SUPPORTS, HARDWARE AND FASTENING DEVICES. EXERCISE CARE IN HANDLING OF FIXTURES, TRIM, PIPE, AND FITTINGS. USE TOOLS DESIGNED TO PREVENT DAMAGE TO SURFACE FINISHES. WHERE FIXTURES OR TRIM ARE DAMAGED OR BROKEN DURING THE INSTALLATION, THEY SHALL BE REPLACED WITH NEW FIXTURES.
- SET FIXTURES LEVEL AND UNIFORMLY, WITH CONNECTIONS AT RIGHT ANGLES TO WALL AND PROPERLY CENTERED. LAY OUT ROUGHING ACCURATELY AND IN COORDINATION WITH SPACE AND FINISH REQUIREMENTS. IF FIELD CUT-OUTS AND HOLES ARE REQUIRED, USE PROPER CUTTING AND DRILLING TOOLS TO MAINTAIN INTEGRITY OF FINISHED SURFACE.
- SUPPORT WALL HUNG FIXTURES RIGIDLY FROM BUILDING CONSTRUCTION, NOT FROM PIPING, BY MEANS OF CONCEALED METAL SUPPORTING MEMBERS DESIGNED TO CARRY WEIGHT OF FIXTURE UNDER CONDITIONS OF UNUSUAL LOADING, WITH NO STRESS PLACED ON WASTE CONNECTION OR ANY OTHER PART OF SYSTEM. SECURE FLOOR MOUNT SUPPORTS TO SLAB. SECURE WALL MOUNT SUPPORTS TO 1/4" THICK METAL BACKUP PLATE SECURED TO WALL CONSTRUCTION. DO NOT USE WIRE, NAILS, OR OTHER MAKESHIFT DEVICES TO SECURE SUPPORTING MEMBERS.
- USE VANDAL PROOF SCREWS TO SECURE FIXTURES, TRIMMINGS AND FITTINGS TO DETER UNAUTHORIZED REMOVAL. PROVIDE CHROME PLATED BRASS WASHERS AND CAP NUTS FOR EXPOSED BOLT ENDS.
- ALL FIXTURES SHALL BE CAULKED TIGHT TO WALLS AND FINISHED SURFACES SO THAT NO VOIDS SHALL REMAIN.
- EXAMINE ROUGH-IN WORK OF POTABLE WATER AND WASTE PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS PRIOR TO INSTALLING FIXTURES. CORRECT ANY INCORRECT LOCATION OF PIPING, AND OTHER UNSATISFACTORY CONDITIONS FOR INSTALLATION OF PLUMBING FIXTURES.
- LOCATE WASTE OUTLETS AND WATER SUPPLIES AT CONSTANT HORIZONTAL LEVELS, WITH WASTE OUTLET CENTERED ON FIXTURE DRAIN CONNECTION AND WATER SUPPLIES SPACED EQUALLY RIGHT.
- PROVIDE ESCUTCHEONS, THREADED OR HELD IN PLACE WITH THREADED PART OR SET SCREW, ON PIPING AND FIXTURE SUPPORTS PROTRUDING FROM WALL OR FLOOR, AND ON VISIBLE CONNECTIONS TO FIXTURES.
- MAKE CONNECTION BETWEEN INTEGRAL TRAPPED FIXTURES AND DRAINAGE PIPING GAS AND WATERTIGHT, WITH CLOSET COUPLING OR FLANGE, CLOSET RING GASKET AND NON-CORROSIVE BOLTING MATERIALS.
- PAINT NON-CORROSIVE FERROUS METAL SURFACES OF FIXTURES, INCLUDING BRACKETS, HANGERS, AND PLATES WITH PRIME COAT OF PAINT.
- UPON COMPLETION OF WORK, REMOVE PROTECTIVE COVERS AND THOROUGHLY CLEAN SURFACES, TRAPS AND STRAINERS. CHECK ALL ITEMS FOR PROPER OPERATION.
- TEST PLUMBING SYSTEMS PER SPECIFICATIONS AND TO SATISFACTION OF BUILDING OFFICIAL. DO NOT CLOSE IN, CONCEAL, OR COVER UP ANY PLUMBING WORK UNTIL IT HAS BEEN TESTED, INSPECTED AND APPROVED.
- FLUSH PIPING, PRIOR TO TESTING, TO REMOVE FOREIGN MATERIALS WHICH MAY HAVE ENTERED DURING COURSE OF INSTALLATION. CLEAN FILTERS AND STRAINERS AFTER FLUSHING.
- ALL EXPOSED PIPING PENETRATIONS THROUGH WALLS OR CEILINGS SHALL BE PROVIDED WITH APPROPRIATE FIRE RETARDANT SEALANT AND ESCUTCHEONS.
- ITEMS NEEDING SAWCUTTING AND PATCHING SHALL BE COORDINATED BETWEEN TRADES. ONLY MAJOR PIECES ARE SHOWN ON DRAWINGS AND DO NOT INDICATE ALL LOCATIONS. PLUMBER SHALL BE RESPONSIBLE FOR CONCEALING ALL NEW WORK, UNLESS NOTED OTHERWISE.
- FLOOR DRAINS SHALL RECEIVE WATER FROM TRAP PRIMER VALVES (TYP.) SEE DETAIL DRAWING.
- PROVIDE ACCESSIBLE CLEANOUTS AT BASE OF EACH VERTICAL WASTE OR SOIL STACK AND STORM LEADERS, AT ENDS OF HORIZONTAL DRAINAGE PIPING RUNS AND AT EACH CHANGE IN DIRECTION GREATER THAN 45 DEGREES; NOT MORE THAN 50 FEET APART ON PIPING 4" AND SMALLER AND NOT MORE THAN 100 FEET APART ON PIPING LARGER THAN 4"; AT JUNCTION OF BUILDING DRAIN WITH BUILDING SEWER.
- TERMINATE VENT PIPING AT LEAST 12" ABOVE ROOF SURFACE GENERALLY; AT LEAST 24" ABOVE ANY WINDOW, DOOR, OR OTHER VENTILATING OPENING WITHIN 10 FEET HORIZONTALLY OF SUCH VENT; AT LEAST 7 FEET ABOVE ROOF ADJACENT TO WALKWAYS AND OTHER HABITABLE AREAS.
- LOCATE WALL HYDRANTS AND LAWN FAUCETS AT LEAST 18" ABOVE GRADE.
- ALL EQUIPMENT SHOWN ON THESE DRAWINGS AND IN PROJECT SPECIFICATION IS BASED UPON SPECIFIED MANUFACTURERS. ANY MODIFICATION AND/OR SUBSTITUTION OF SAID EQUIPMENT IS SUBJECT TO COMPLETE COORDINATION OF ALL CONNECTIONS, POWER, SERVICES, OPENING SIZES AND OTHER CONSTRUCTION RELATED REQUIREMENTS BY THE TRADE CONTRACTOR PROVIDING THE EQUIPMENT.

PLUMBING FIXTURE CONNECTION SCHEDULE

LEGEND	DESCRIPTION	SOIL/ WASTE (S/W)	VENT (V)	COLD WATER (CW)	HOT WATER (HW)	REMARKS	SPECIFICATION
P-1	WATER CLOSET	4"	2"	1"	-		AMERICAN STANDARD "AFWALL MILLENNIUM FLOWISE" 2257.101 WHITE VITREOUS CHINA, 1.28 GALLONS PER FLUSH, FLOOR MOUNTED, ELONGATED BOWL DESIGN, SIPHON JET FLUSHING WITH 1½" TOP SPUD, INSTALL WITH 1.28 GPF AMERICAN STANDARD FLUSH VALVE, OPEN FRONT SEAT WITH CHECK HINGE.
P-1A	WATER CLOSET (ADA)	4"	2"	1"	-	SET AT REQUIRED HANDICAPPED HEIGHT	AMERICAN STANDARD "AFWALL MILLENNIUM FLOWISE" 2257.101 WHITE VITREOUS CHINA, 1.28 GALLONS PER FLUSH, FLOOR MOUNTED, ELONGATED BOWL DESIGN, SIPHON JET FLUSHING WITH 1½" TOP SPUD, INSTALL WITH 1.28 GPF AMERICAN STANDARD FLUSH VALVE, OPEN FRONT SEAT WITH CHECK HINGE.
P-2	URINAL	2"	1-1/2"	3/4"	-	SET AT REQUIRED HANDICAPPED HEIGHT	AMERICAN STANDARD MAYBROOK UNIVERSAL URINAL WITH EVERCLEAN 6581.001EC WHITE VITREOUS CHINA, 0.5 GALLON PER FLUSH, WALL HUNG, WASHOUT DESIGN, ELONGATED RIM, 3/4" TOP SPUD INLET, 2" I.P.S. OUTLET, 3/4" I.P.S. ANGLE STOP WITH BACK-FLOW PROTECTION AND VANDAL-RESISTANT CAP, WALL HANGERS AND STRAINER. AMERICAN STANDARD FLUSH VALVE MODEL 0.5 GPF.
P-3	LAVATORY-WALL MOUNTED	1-1/2"	1-1/2"	1/2"	1/2"		AMERICAN STANDARD "DECORUM" 9024.011EC WALL HUNG VITREOUS CHINA LAVATORY WITH CENTER HOLE, CONCEALED ARM SUPPORT, 17 GAUGE CAST BRASS P-TRAP WITH CLEANOUT PLUG AND GRID STRAINER. PROVIDE PUSH KNOB METERING FAUCET, INSTALL WITH WATER CONSERVING 1.5 GPM PRESSURE-COMPENSATING VANDAL-RESISTANT AERATOR. PROVIDE POWERS E480 ASSE 1070 COMPLIANT BELOW DECK THERMOSTATIC MIXING VALVE
P-3A	LAVATORY-WALL MOUNTED (ADA)	1-1/2"	1-1/2"	1/2"	1/2"	SET AT REQUIRED HANDICAPPED HEIGHT	AMERICAN STANDARD "DECORUM" 9024.011EC WALL HUNG VITREOUS CHINA LAVATORY WITH CENTER HOLE, CONCEALED ARM SUPPORT, 17 GAUGE CAST BRASS P-TRAP WITH CLEANOUT PLUG AND GRID STRAINER. PROVIDE PUSH KNOB METERING FAUCET, INSTALL WITH WATER CONSERVING 1.5 GPM PRESSURE-COMPENSATING VANDAL-RESISTANT AERATOR. PROVIDE POWERS E480 ASSE 1070 COMPLIANT BELOW DECK THERMOSTATIC MIXING VALVE
HB	HOSE BIBB	-	-	1/2"	-		ZURN Z1341-P34 EXPOSED, ANTI-SIPHON, WALL FAUCET COMPLETE WITH Z1389-VB EXTERNAL VACUUM BREAKER, ALL BRONZE INTERIOR COMPONENTS, VANDAL RESISTANT OPERATING STEM, ROUGH BRONZE EXTERIOR AND ASME B1.20.7 ¾" NPS THREADED MALE HOSE CONNECTION.

NO. DATE REVISION

1	10-02-23	COORDINATION SET

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

DRAWING TITLE

JOB: 2023-12
DATE: 10-06-23
SCALE: AS SHOWN
DWN: MICHAEL OEHLEIN

M,E,P,&FP CONSULTANT:

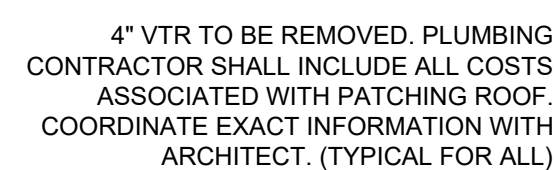
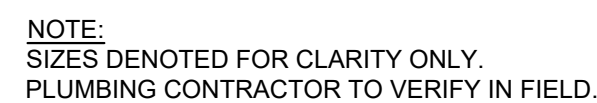
GPI

Engineering
Design
Construction Management

845.368.4050
Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901

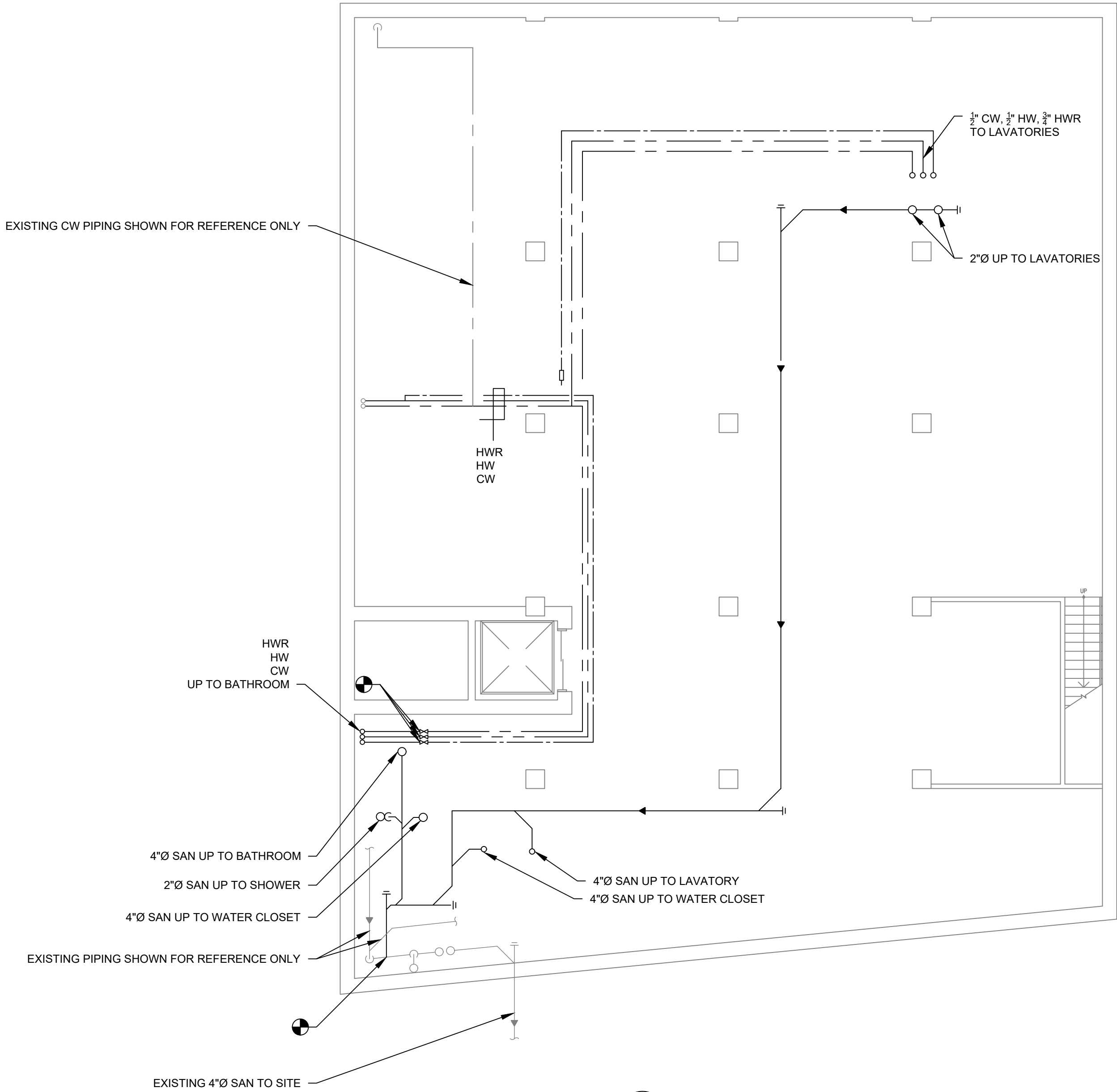
GPI.NET.COM

P-001.00

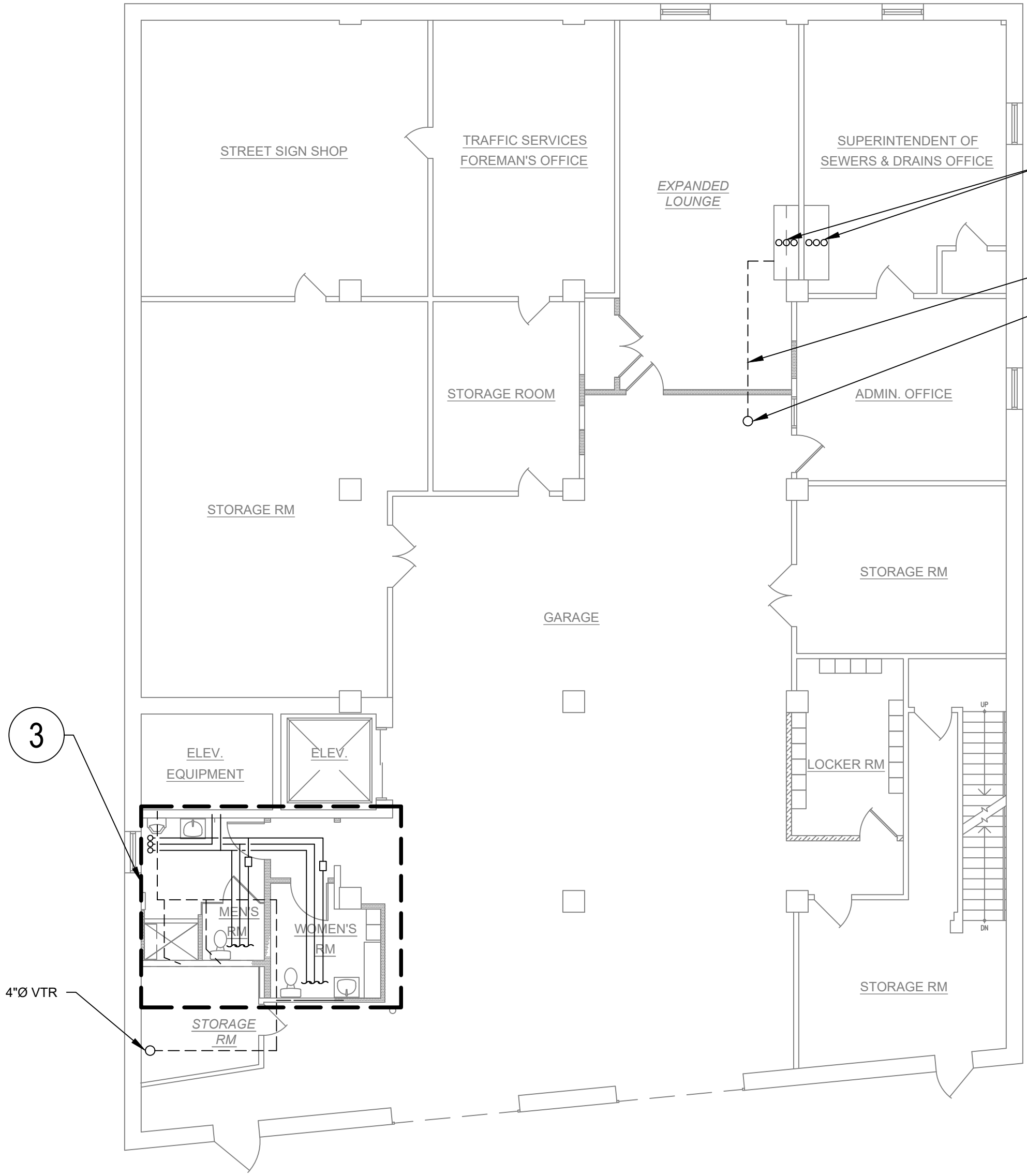


DWG. 2 OF 4

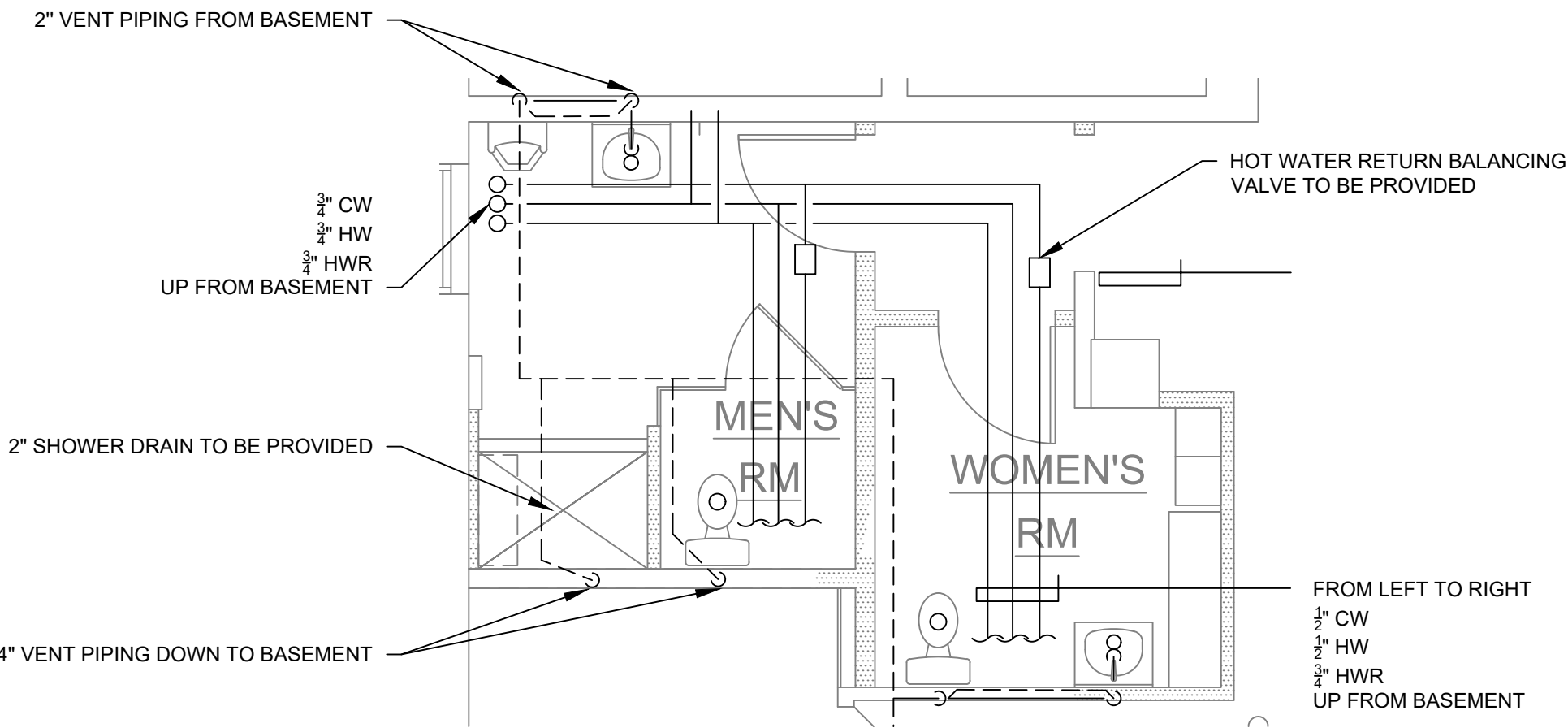
DRAWING TITLE	
JOB:	2023-12
DATE:	10-06-23
SCALE:	AS SHOWN



1 BASEMENT PROPOSED PLAN
SCALE - 1/8" = 1'-0"



2 FIRST FLOOR PROPOSED PLAN
SCALE - 1/8" = 1'-0"



3 ENLARGED BATHROOM PLAN
SCALE - 1/4" = 1'-0"



PLUMBING CONTRACTOR TO PROVIDE 3" CW, 3" HW, 3" HWR PIPING UP FROM BASEMENT.

PLUMBING CONTRACTOR TO PROVIDE 2"Ø VENT AT CEILING.

PLUMBING CONTRACTOR SHALL PROVIDE 4"Ø VTR.

GENERAL NOTES:
1. FOR NOTES, SYMBOLS, ABBREVIATIONS, AND SCHEDULES REFER TO DRAWING P001.00
2. ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED.

M,E,P.&FP CONSULTANT:

GPI Engineering Design Planning Construction Management

845.368.4050 GPINET.COM

Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901

NO.	DATE	REVISION
1	10-06-23	COORDINATION SET

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

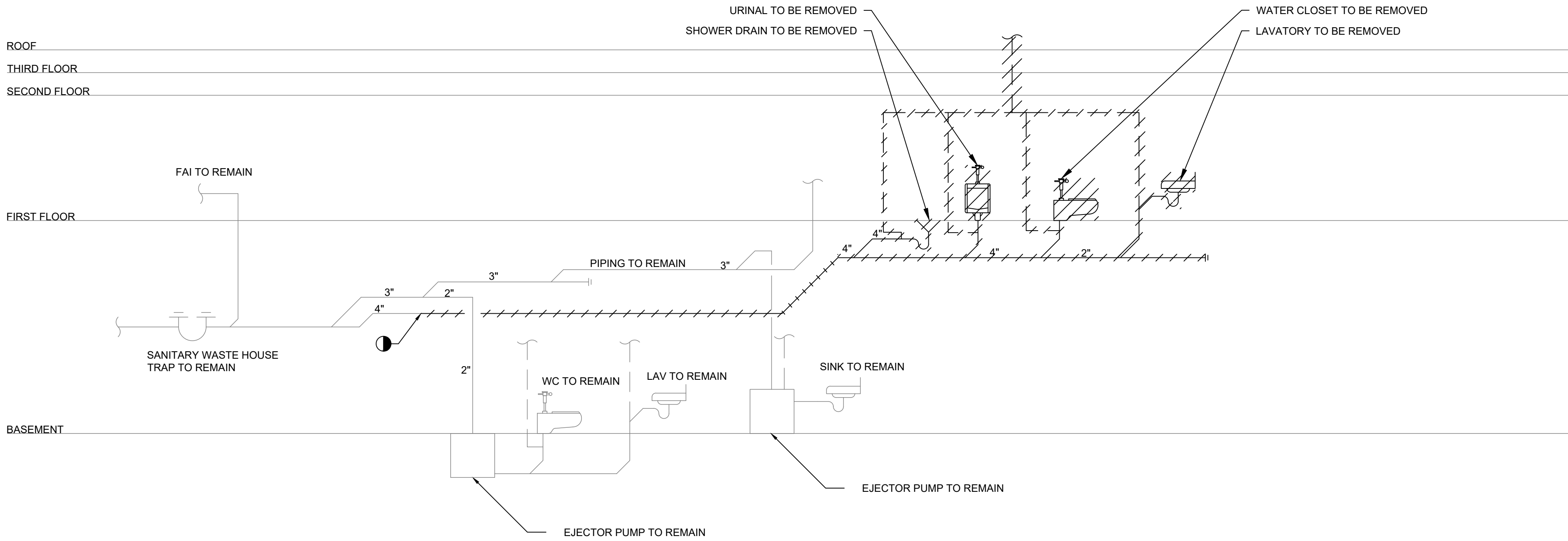
Element Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7756 NJ LIC. AIO12156; NY LIC. 024305

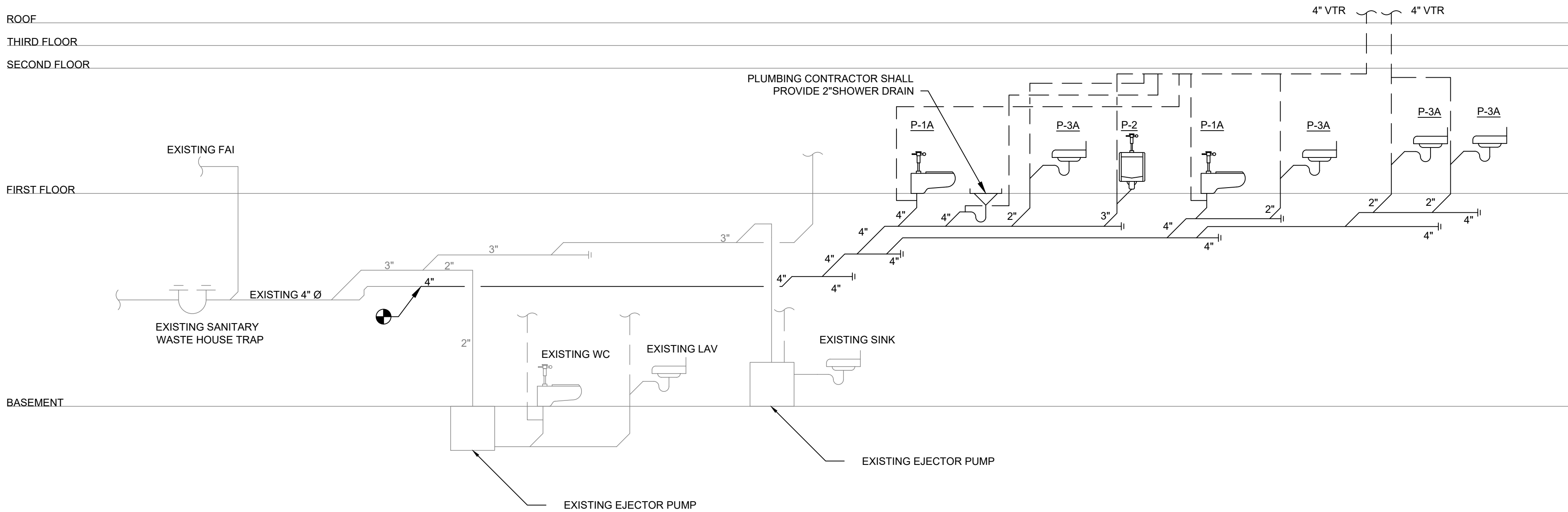
PLUMBING BASEMENT AND FIRST FLOOR PROPOSED PLANS

JOB:	2023-12
DATE:	10-06-23
SCALE:	AS SHOWN
DWN:	MICHAEL OEHRLIN

P-101.00



1 SANITARY RISER DIAGRAM - REMOVAL
NOT TO SCALE



2 SANITARY RISER DIAGRAM - PROPOSED
NOT TO SCALE

GENERAL NOTES:

- FOR NOTES, SYMBOLS, ABBREVIATIONS, AND SCHEDULES REFER TO DRAWING P001.00
- ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED.

M,E,P.&FP CONSULTANT:

GPI

845.368.4050

Engineering
Design
Planning
Construction Management

GPINET.COM

Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901

DRAWING TITLE

JOB: 2023-12
DATE: 10-06-23
SCALE: AS SHOWN
DWN: MICHAEL OEHRLIN

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element

Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7756 NJ LIC. AIO12156; NY LIC. 024305

NO.	DATE	REVISION
1	10-06-23	COORDINATION SET

P-401.00
DWG. 4 OF 4

GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH 2020 NEW YORK STATE BUILDING CODE AND 2017 NEC CODE.
2. THE CONTRACTOR SHALL CHECK THE LOCATION, NUMBER AND SIZE OF ALL CHASES PROVIDED ON THE CONSTRUCTION PLANS AND ARRANGE FOR ANY CHASES REQUIRED FOR CABINET OR BOXES.
3. THE CONTRACTOR SHALL PATCH AND PAIN ALL AFFECTED BUILDING SURFACES & CONDUITS TO MATCH EXISTING FINISHES.
4. THIS CONTRACTOR SHALL PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS ON NORMAL AND EMERGENCY CIRCUITS.
5. SPECIAL INSPECTIONS SHALL BE CARRIED OUT IN ACCORDANCE WITH APPLICABLE BUILDING CODE SECTIONS AND SHALL INCLUDE THE FOLLOWING.

A. FIRESTOP, DRAFTSTOP, AND FIREBLOCK SYSTEMS BC 1704.25
6. THE CONTRACTOR SHALL BE HELD TO HAVE VISITED THE PREMISES AND TO HAVE COMPARED THEIR OBSERVATIONS WITH THE DRAWINGS AND SPECIFICATIONS, AND TO HAVE VERIFIED THE EXISTING CONDITIONS THROUGHOUT THE BUILDING.
7. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD, AND BE RESPONSIBLE FOR THE SAME PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER, THE ARCHITECT AND THE ENGINEER ON RECORD.
8. ALL ELECTRICAL WIRING SHALL ADHERE TO THE LATEST REVISION OF BOTH NATIONAL ELECTRICAL CODE AND THE NEW YORK STATE BUILDING CODES.
9. ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE AND MOST RECENT EDITION OF THE STATE AND LOCAL CODES AND SHALL MEET THE REQUIREMENTS OF ALL OTHER AUTHORITIES, ORGANIZATIONS AND GOVERNMENT AGENCIES HAVING JURISDICTION.
10. THE WORK OF THIS CONTRACT IS TO BE PERFORMED WITH A HIGH LEVEL OF QUALITY. WORK WHICH IS, IN THE OPINION OF DESIGNATED REPRESENTATIVE NOT IN COMPLIANCE WITH THE HIGHEST RECOGNIZED INDUSTRY STANDARD FOR WORKMANSHIP OR WORK WHICH HAS BEEN DAMAGED BY FACILITY WORKMANSHIP, WILL BE REMOVED AND REPLACED, OR REPAIRED TO THE SATISFACTION OF THE OWNER.
11. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY TO COMPLETE THE WORK DESCRIBED HEREIN AND/OR AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS. DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER CONSTRUCTION SHALL BE INCLUDED AS IF THEY WERE ON THE DRAWINGS.
12. THE LOCATIONS SHOWN ON THE DRAWINGS INDICATE INTENT AND SHALL BE VERIFIED IN THE FIELD.
13. ALL HOLES MADE BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE PROPERLY PATCHED AND REPAIRED. ALL CONDUIT PENETRATIONS THROUGH FLOORS AND WALLS SHALL BE SEALED.
14. THE CONTRACTOR SHALL DO ALL CUTTING, PATCHING AND REPAIRING AS REQUIRED TO PERFORM ALL WORK INDICATED ON THE DRAWINGS, AND ALL OTHER WORK THAT MAY BE REQUIRED TO COMPLETE THE JOB.
15. THE CONTRACTOR SHALL PROVIDE ALL PHYSICAL PROTECTION REQUIRED TO PROTECT ALL EQUIPMENT DURING CONSTRUCTION.
16. WHERE CONDUIT ROUTING HAS NOT BEEN SHOWN ON THE DRAWINGS, THE ROUTING OF POWER BRANCH CIRCUITS WILL BE AT THE CONTRACTOR'S DISCRETION AND THE OWNER APPROVAL IN ACCORDANCE WITH CODES AND SPECIFICATIONS.
17. PROVIDE FIRE STOP SEALS TO ALL PENETRATIONS OF FIRE RATED PARTITIONS.
18. ALL CIRCUITS CONTAINING GFI OUTLETS AND CIRCUITS RECOMMENDED BY THE MANUFACTURERS SHALL HAVE A SEPARATE DEDICATED NEUTRAL.
19. PROVIDE COLOR CODING FOR BRANCH CIRCUITS & FEEDERS AS FOLLOWS FOR 120/208V CONDUCTORS\ BLACK PHASE "A", RED PHASE "B", BLUE PHASE "C", WHITE NATURAL & GREEN GROUNDING.
20. PLACEMENT OF ALL ELECTRICAL DEVICES MUST BE COORDINATED WITH FURNITURE LAY-OUTS. THE ELECTRICAL CONTRACTOR SHALL BE HELD RESPONSIBLE FOR SUBMITTING SHOP DWGS FOR LOCATION OF ALL ELECTRICAL DEVICES. THE SHOP DWGS MUST INDICATE THE MOUNTING HEIGHTS & CENTER LINE DISTANCE FROM THE NEAREST COLUMN. IN ADDITION REFER TO SPECIFICATION SECTION 16130 PART 3.04 FOR ADDITIONAL MOUNTING HEIGHT INFORMATION.
21. CONTRACTOR SHALL NOT INSTALL MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY UNLESS OTHERWISE SPECIFICALLY INDICATED ON THE DRAWINGS.
22. THE ELECTRICAL CONTRACTOR SHALL REVIEW ALL TRADES CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR ELECTRICAL EQUIPMENT.
23. FINAL LOCATION OF ALL ELECTRICAL DEVICES/EQUIPMENT SHALL BE COORDINATED BY THE CONTRACTOR AT FIELD WITH ALL OTHER BUILDING ELEMENTS, PIPES, MECHANICAL, PLUMBING AND SPRINKLER EQUIPMENTS IN ORDER TO PROVIDE CODED COMPLIANCE ELECTRICAL INSTALLATION.
24. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH OTHER TRADES AT FIELD SO THAT NO FOREIGN SYSTEM SUCH AS PIPING, DUCT, LEAK PROTECTION APPARATUS, OR OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE RUN OVER THE4 ELECTRICAL EQUIPMENT INSTALLATION.

ELECTRICAL DEMOLITION NOTES:

1. THE DEMOLITION WORK SHALL BE CARRIED ON IN EVERY RESPECT IN A THOROUGH AND WORKMANLIKE MANNER.
2. ALL DEMOLITION, REMOVAL, AND DISPOSAL WORK SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE BUILDING CODE AND WITH ALL STATE AND FEDERAL REGULATIONS.
3. REMOVE ALL DEBRIS NOT EXPLICITLY DESIGNATED TO BE SALVAGED (TO REMAIN) FROM THE PREMISES AND LEGALLY DISPOSE OFF AWAY FROM PREMISES.
4. ITEMS INDICATED TO BE SALVAGED SHALL BE REMOVED EITHER BEFORE DEMOLITION OR DURING THE PROCESS OF THE WORK, STORED AND PROTECTED ON THE SITE IN A LOCATION DESIGNATED BY THE AUTHORITY'S REPRESENTATIVE. THESE ITEMS WILL BE IDENTIFIED AND RETAINED BY THE AUTHORITY.
5. CAREFULLY REMOVE AND PROTECT ALL ITEMS TO BE SAVED AND REUSED AS INDICATED ON DRAWINGS. REPLACE ANY ITEMS THAT ARE DAMAGED BY REMOVAL AT YOUR OWN COST. NOTIFY THE AUTHORITY IN WRITING OF ANY ITEM THAT IS DAMAGED PRIOR TO REMOVAL SO THAT THEY MAY ASCERTAIN THE ITEM'S CONDITION.
6. PROTECT MATERIALS, SURFACES AND STRUCTURE, WHICH ARE TO REMAIN, FROM DAMAGE; IF DAMAGE OCCURS, REPAIR OR REPLACEMENT SHALL BE MADE BY THE CONTRACTOR, TO THE SATISFACTION OF THE AUTHORITY, AND AT THE EXPENSE OF THE CONTRACTOR.
7. DISCONNECT, REMOVE AND RELOCATE ANY ELECTRICAL EQUIPMENT NOT SHOWN ON THESE DRAWINGS AS PART OF THIS CONTRACT, BUT INTERFERES WITH THE WORK UNDER THIS CONTRACT. THIS WORK SHALL NOT BE CONSIDERED EXTRA AND SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
8. VISIT AND EXAMINE CAREFULLY THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH THE DIFFICULTIES THAT ATTEND THE EXECUTION OF THIS WORK. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED.
9. RELOCATE AND/OR ALTER THE EXISTING BUILDING COMPONENTS AS DIRECTED BY AUTHORITY'S REPRESENTATIVE. ALL RELOCATION OR ALTERATIONS TO BUILDING SHALL BE RESTORED TO THEIR ORIGINAL RUBBING CONDITIONS AFTER SUCH RELOCATION OR ALTERATION WORK.
10. AT THE COMPLETION OF DEMOLITION WORK, ALL RUBBISH, DEBRIS AND WASTE MATERIALS SHALL BE REMOVED BY THE CONTRACTOR AND THE PREMISES SHALL BE LEFT IN CLEAN CONDITION.
11. THE CONTRACTOR SHALL DISCONNECT THE CIRCUIT WIRING NOT IN USE AND SHALL REMOVE ALL NECESSARY WIRING MATERIALS, INCLUDING EXPOSED CONDUITS AND JUNCTION BOXES WHICH IMPEDE THE NEW WORK.
12. MAINTAIN CONTINUITY FOR ALL EQUIPMENT TO REMAIN. PROVIDE ALL REQUIRED ACCESSORIES, WIRING AND CONDUIT AS REQUIRED.
13. SUBSTANTIAL JOB COMPLETION INCORPORATES DEMOLITION OF EXISTING SYSTEMS IN CONTRACT.
14. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION.

ELECTRICAL INSTALLATION NOTES:










1. CONTRACTOR SHALL PERMANENTLY FASTEN ALL THE EQUIPMENT AS INDICATED ON THE DRAWINGS IN AN APPROVED MANNER, WITH ALL NECESSARY HARDWARE.
2. CONTRACTOR SHALL PROVIDE ALL CONDUITS, WIRING, OUTLET BOXES AND ALL ACCESSORIES NECESSARY TO COMPLETE THE WIRING TO ALL COMPONENTS OF THE SYSTEM. ALL CONNECTIONS SHALL BE MADE COMPLETE AND TESTED.

SCOPE OF WORK:

1. DISCONNECT EXISTING LIGHT FIXTURES ALONG WITH ASSOCIATED WIRING, CONDUITS AND JUNCTION BOXES BACK TO SOURCE IN AREA OF WORK. REPLACE WITH NEW LED LIGHT FIXTURES.
2. PROVIDE (5)-20A, 1 POLE CIRCUIT BREAKERS TO ACCOMMODATE THE NEW LOADS.

ABBREVIATIONS

A	AMPERE	LP	120/208V PANEL
AC	ALTERNATING CURRENT	LS	LOUDSPEAKER
ACS	ADMINISTRATIVE CONTROL STATION	LTG	LIGHTING
ADA	AMERICANS WITH DISABILITIES ACT	MATV	MASTER TELEVISION
AFF	ABOVE FINISHED FLOOR	MCC	MOTOR CONTROL CENTER
ARCH	ARCHITECTURAL	MECH	MECHANICAL
ATS	AUTOMATIC TRANSFER SWITCH	MER	MECHANICAL EQUIPMENT ROOM
A/C	AIR CONDITIONING	MIC	MICROPHONE
C	CONDUIT	MTD	MOUNTED
CAB	CABINET	N	NEUTRAL
CLG	CEILING	N.C.	NORMALLY CLOSED
CB	CIRCUIT BREAKER	N.O.	NORMALLY OPEN
CKT(S)	CIRCUIT(S)	O & R	ORANGE AND ROCKLAND
COL	COLUMN	P	POLE(S)
DWG	DRAWING	PB	PULL BOX
EC	EMPTY CONDUIT	PXL	PANEL
ELEC	ELECTRIC	PP	277/480V PANEL
EMR	ELEVATOR MECHANICAL ROOM	RC	REMOTE CONTROL
ER	EXISTING TO BE RELOCATED	SP	SPARE
EXH	EXHAUST	SSB	SOLID STATE BALLAST
EXIST	EXISTING	STD	STANDARD
FATB	FIRE ALARM TERMINAL BOX	SW	SWITCH
FL	FLOOR	SWBD	SWITCHBOARD
G	GUARD	TEL	TELEPHONE
GND	GROUND	TV	TELEVISION
GFI	GROUND FAULT INTERRUPTOR	TYP	TYPICAL
GRC	GALVANIZED RIGID CONDUIT	V	VOLT
IG	ISOLATED GROUND	W	WATT
JB	JUNCTION BOX	WP	WEATHERPROOF
KVA	KILOVOLT AMPERE		
KW	KILOWATT		
KWH	KILOWATT HOUR		

	DUPLEX RECEPTACLE 125V, 20A (NEMA 5-20R) GFI=GROUND FAULT INTERRUPTOR
	JUNCTION BOX - WALL MOUNTED
	SINGLE POLE TOGGLE LINE-VOLTAGE SWITCH MOUNTED AT 48" A.F.F. SUBSCRIPT DENOTES LIGHTING FIXTURES CONTROLLED. 'VS' INDICATES INTEGRATED WITH OCCUPANCY (IN VACANCY MODE) SENSOR (MANUAL ON/AUTOMATIC OFF).
	CEILING MOUNTED LOW VOLTAGE OCCUPANCY SENSOR, MANUAL 'ON'/AUTOMATIC 'OFF' (VACANCY MODE). 'H' INDICATES HIGH BAY.
	PANELBOARD
	HOMERUN
	NEW LED FIXTURE
	TO BE DEMOLISHED
	CCTV CAMERA

PANEL SCHEDULE										
PANEL NAME:	Existing Panel "LP2"	LOCATION:		Existing Storage Room			MOUNTING:		Wall Mounted	
VOLTAGE/PHASE:	120/208V, 3 Phase, 4W,& G	PANEL (AMP)		225A			FREQUENCY:		60 Hz	
PANEL SHORT CIRCUIT RATING(KA):	22 KA	FEEDER SIZE		EXISTING FEEDER			FEEDING SOURCE:		EXISTING	
MAIN BREAKER TYPE	MLO	MAIN BREAKER RATING (A):		MLO			BRANCH C.B TYPE		MCB	
Load Designation	Wiring	Phase Load in VA						Wiring	Load Designation	
		C/B (A)	CT NO	A Ø	B Ø	C Ø	CT NO			C/B (A)
EXISTING LOAD		20	1				2	20	EXISTING LOAD	
EXISTING LOAD		20	3				4	20	EXISTING LOAD	
EXISTING LOAD		20	5				6	20	EXISTING LOAD	
EXISTING LOAD		20	7				8	20	EXISTING LOAD	
EXISTING LOAD		20	9				10	20	EXISTING LOAD	
EXISTING LOAD		20	11				12	20	EXISTING LOAD	
EXISTING LOAD		20	13				14	20	EXISTING LOAD	
EXISTING LOAD		20	15				16	20	EXISTING LOAD	
EXISTING LOAD		20	17				18	20	EXISTING LOAD	
EXISTING LOAD		20	19				20	20	EXISTING LOAD	
EXISTING LOAD		20	21				22	20	EXISTING LOAD	
EXISTING LOAD		30	23				24	30	EXISTING LOAD	
		25				26				
EXISTING LOAD		15	27				28	50	EXISTING LOAD	
		29				30				
		31				32				
AUTOMATIC HAND DRYER	2 #12+1 #12G-3/4"C	20	33				34	20	2 #12+1 #12G-3/4"C	RECEPTACLES
LIGHT FIXTURES	2 #12+1 #12G-3/4"C	20	35				36	20	2 #12+1 #12G-3/4"C	LIGHT FIXTURES
RECEPTACLES	2 #12+1 #12G-3/4"C	20	37				38	20	2 #12+1 #12G-3/4"C	AUTOMATIC HAND DRYER
SPACE			39				40			SPACE
SPACE			41				42			SPACE
CONNECTED LOAD PER PHASE IN VA				0	0	0	PANEL TYPE: NEMA 1		MOUNTING: SURFACE	
TOTAL CONNECTED LOAD IN KVA				0			COPPER BUS, EQUIP. GROUND BAR, & CLASS B SURGE PROTECTOR			
TOTAL DEMAND LOAD IN AMPS				0.00			DOOR: INDOOR TYPE			

NEW LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	FIXTURE WATTAGE	VOLTAGE	MANUFACTURER/MODEL	COMMENTS
A1 RECESSED 2'X4'	2X4 RECESSED LED - 3200 LM	RECESSED	35 W	120	ALCON # 14115-24-35-35K-ND (2800 LUMEN)	LOUNGE
B1 HANG 2'X4'	2X4 LED WRAPAROUND. FINAL MOUNTING HEIGHT SHALL BE COORDINATED WITH ARCHITECT	STEM HANGER	43 W	120	COLUMBIA # LAW-4-35-ML-ED-U-SS18 (4908 LUMEN)	TOILET/STORAGE

NO.	DATE	REVISION
1	10-02-23	COORDINATION SET

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element
Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7756 NJ LIC. AIO12156; NY LIC. 024305

ELECTRICAL GENERAL NOTES, SYMBOL LIST, SCHEDULES AND ABBREVIATIONS	JOB:	2023-12
	DATE:	10-06-23
	SCALE:	AS SHOWN
	DWN:	KAZUHIRO DAYO

M,E,P,&FP CONSULTANT:

GPI

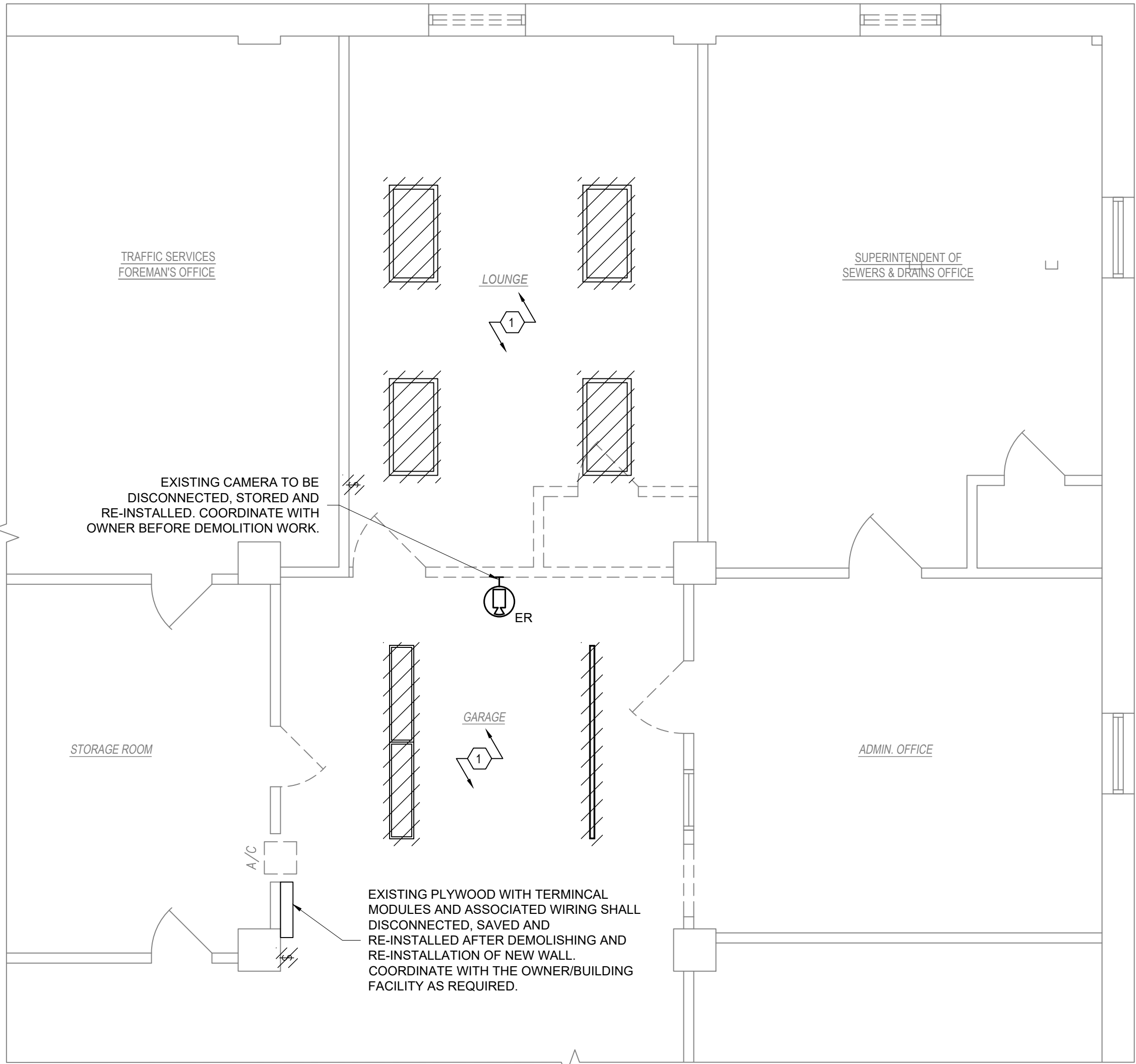
845.368.4050

Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901

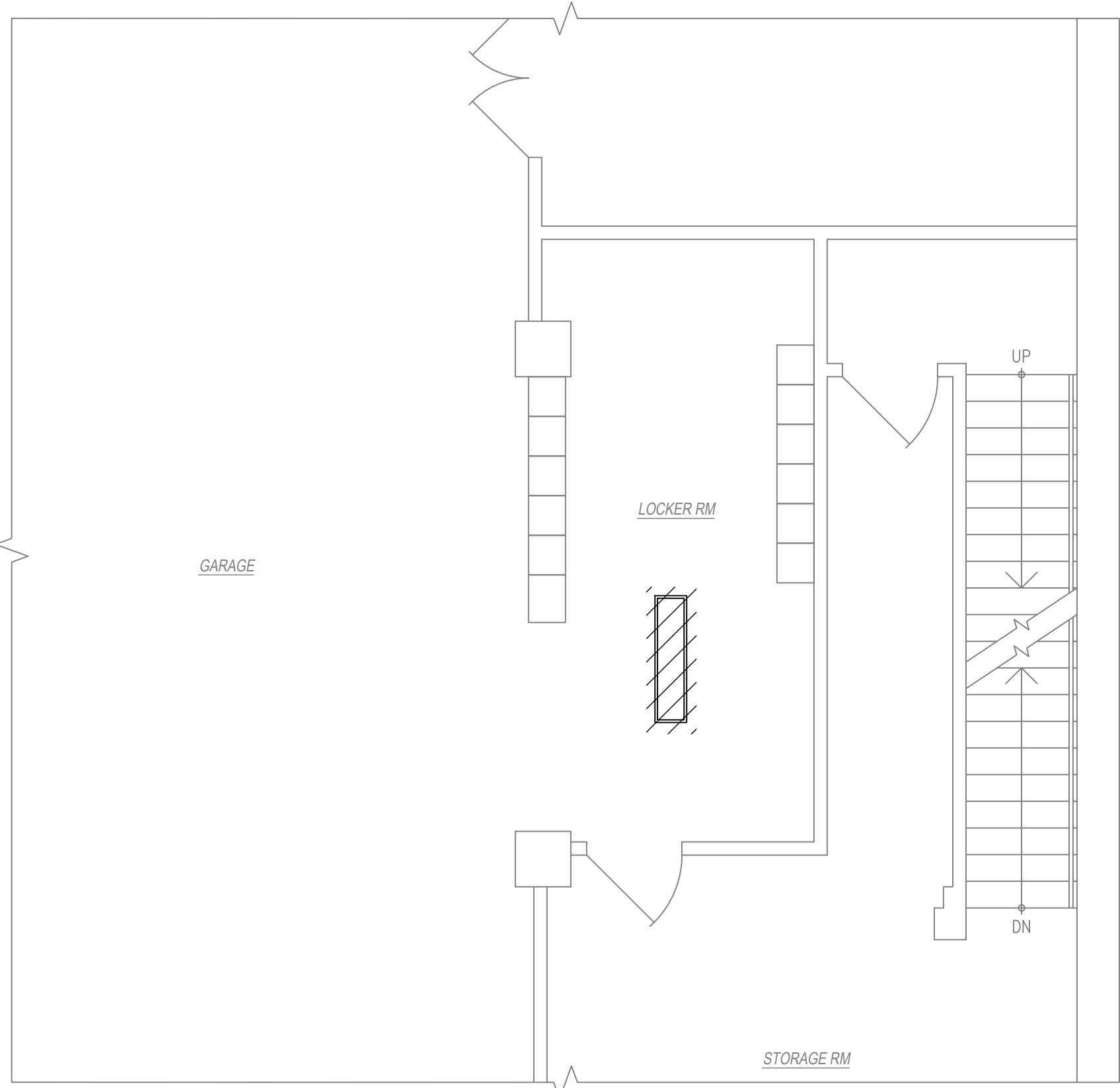
Engineering
Design
Planning
Construction Management

GPI.NET.COM

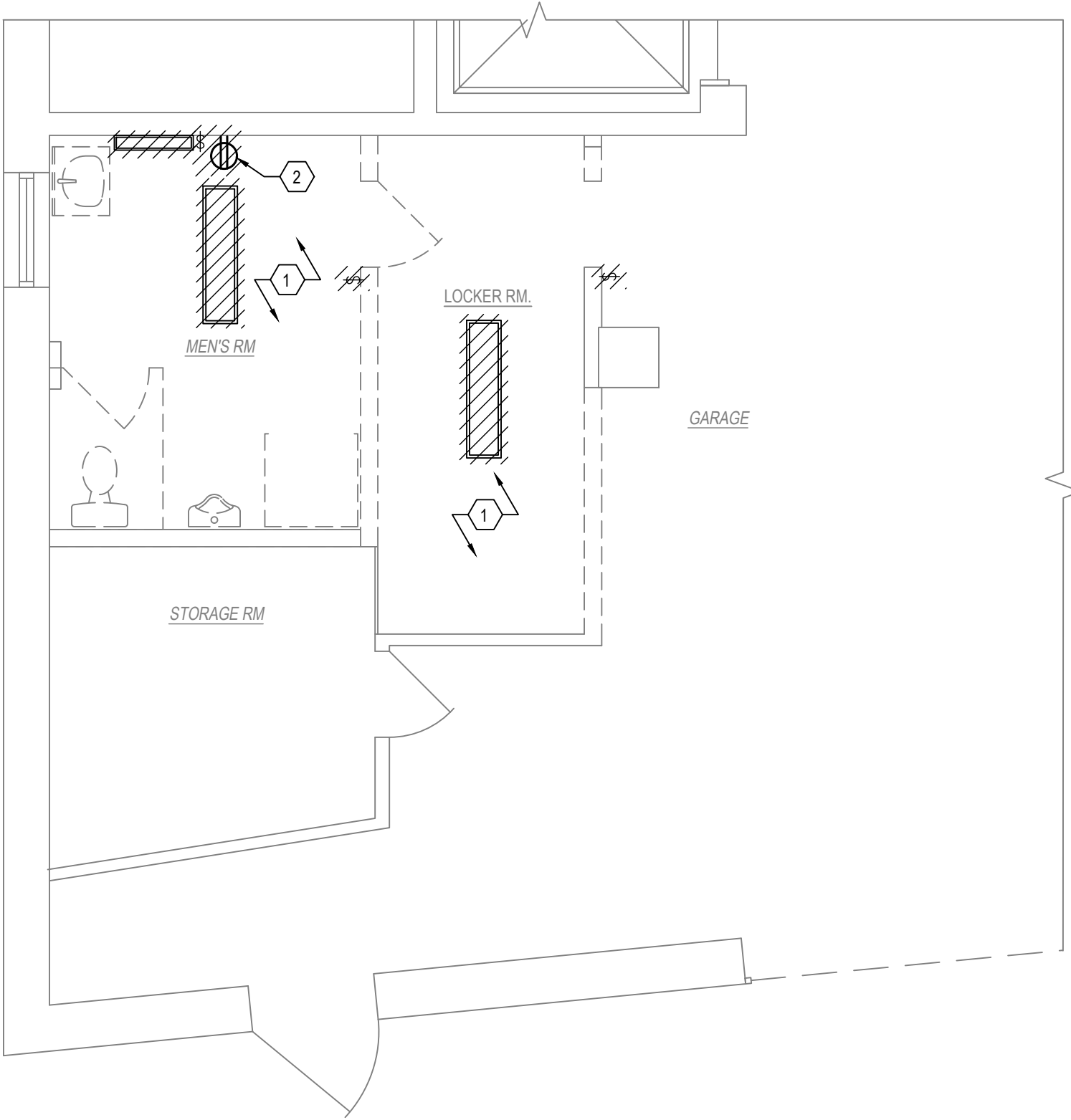
E-001.00



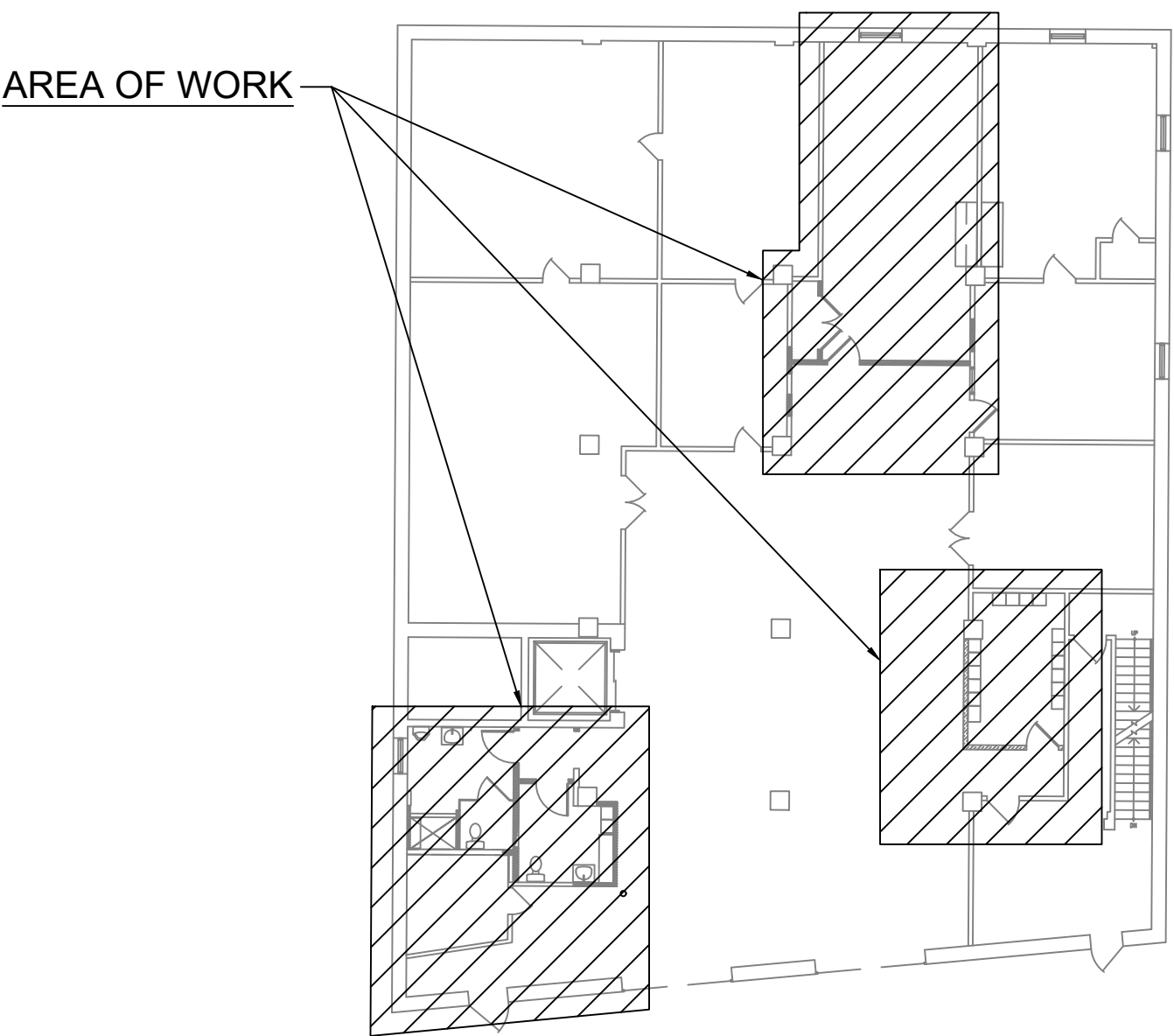
1 FIRST FLOOR REMOVAL PARTIAL PLAN
SCALE - 1/4" = 1'-0"



3 FIRST FLOOR REMOVAL PARTIAL PLAN
SCALE - 1/4" = 1'-0"



2 FIRST FLOOR REMOVAL PARTIAL PLAN
SCALE - 1/4" = 1'-0"



4 FIRST FLOOR KEY PLAN
SCALE - N.T.S.

KEYED NOTES:

- 1. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURES IN THIS AREA ALONG WITH ASSOCIATED SWITCH, WIRING, CONDUIT AND JUNCTION BOX BACK TO SOURCE.
- 2. REMOVE EXISTING RECEPTACLE ALONG WITH ASSOCIATED WIRING, CONDUIT AND JUNCTION BOXES BACK TO SOURCE.

NO.	DATE	REVISION
1	10-06-23	COORDINATION SET

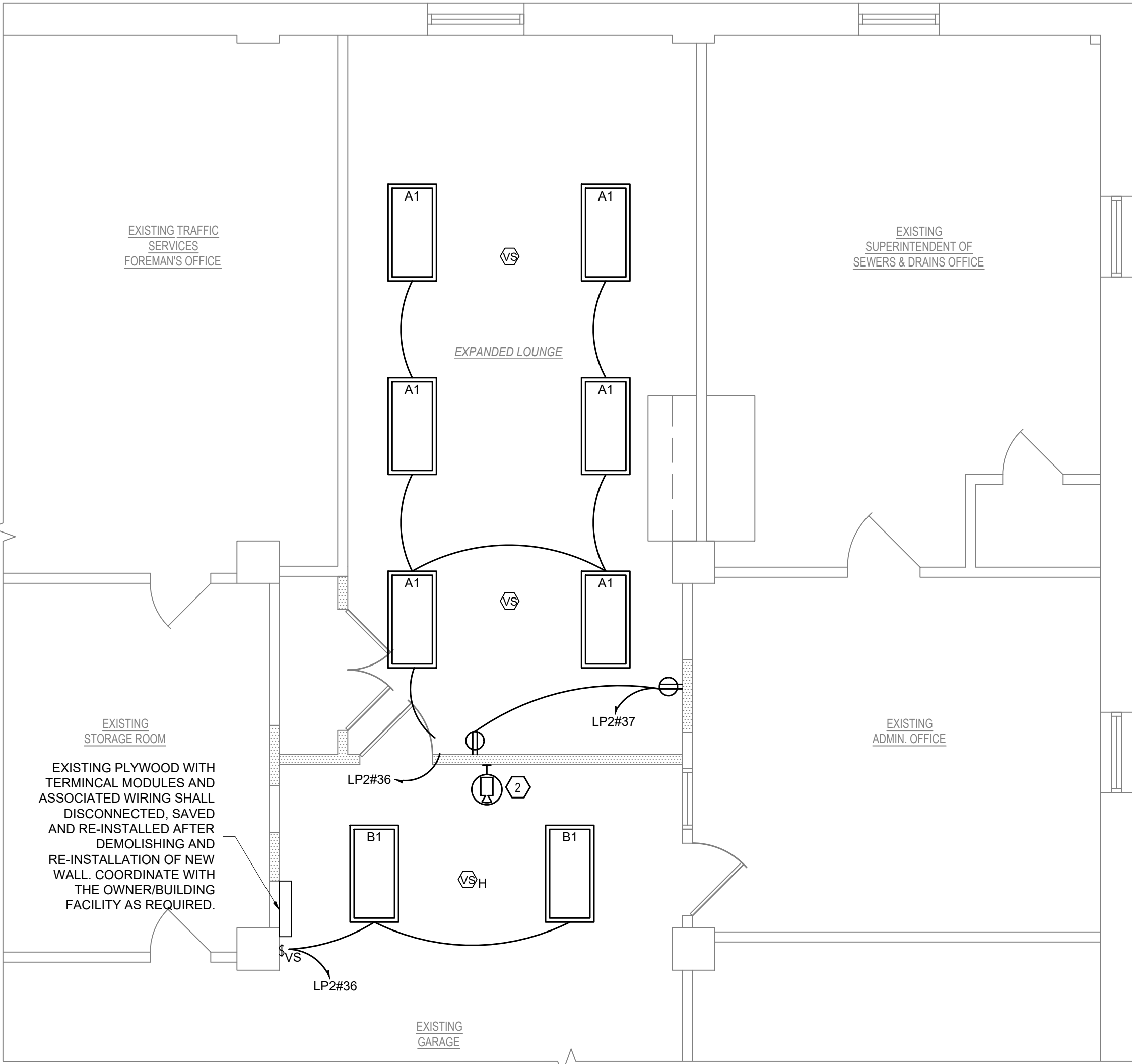
INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element Architectural Group
12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7756 NJ LIC. AIO12156; NY LIC. 024305

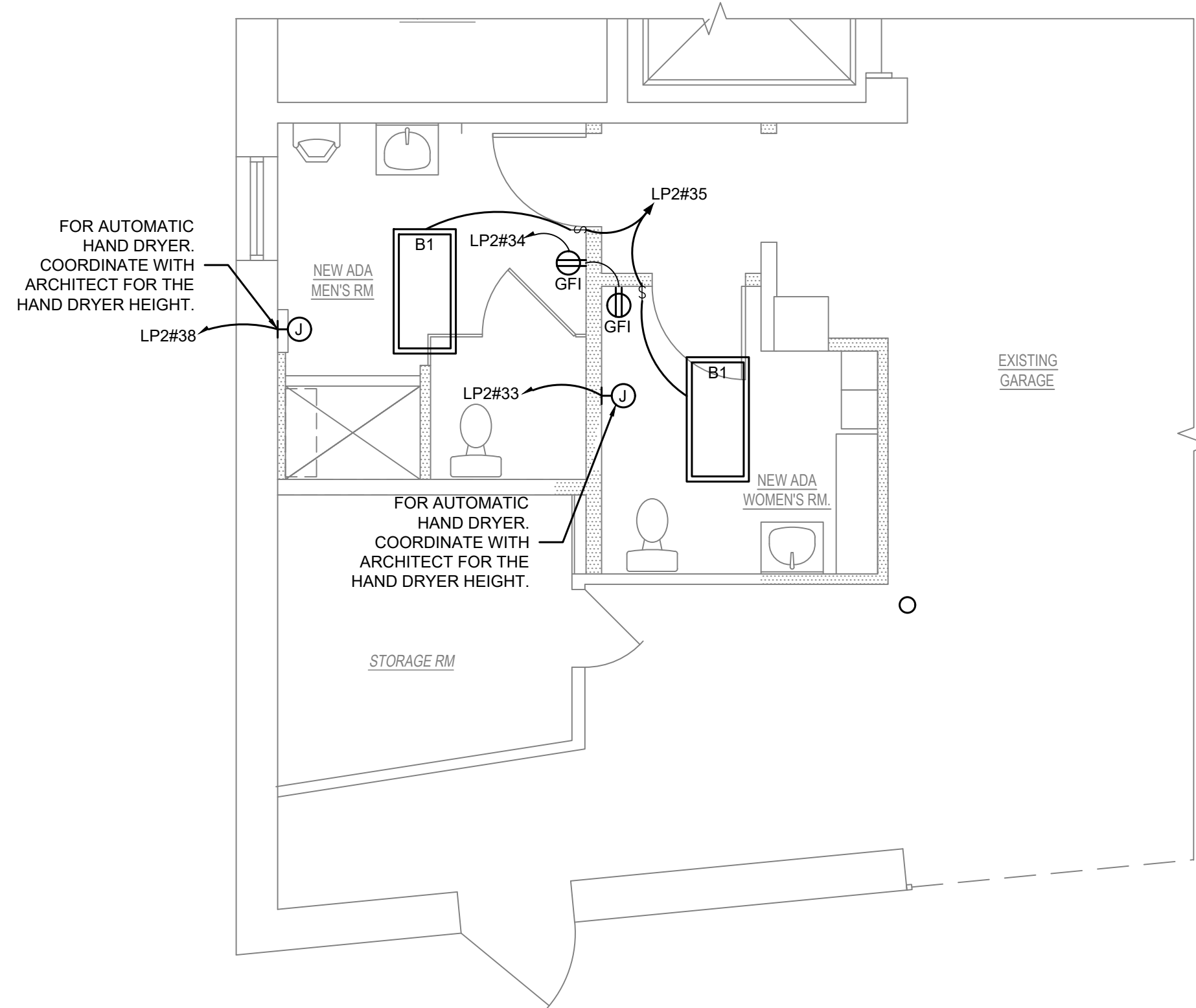
ELECTRICAL REMOVAL PARTIAL PLAN
JOB: 2023-12
DATE: 10-06-23
SCALE: AS SHOWN
DWN: KAZUHIRO DAYO

M,E,P.&FP CONSULTANT:

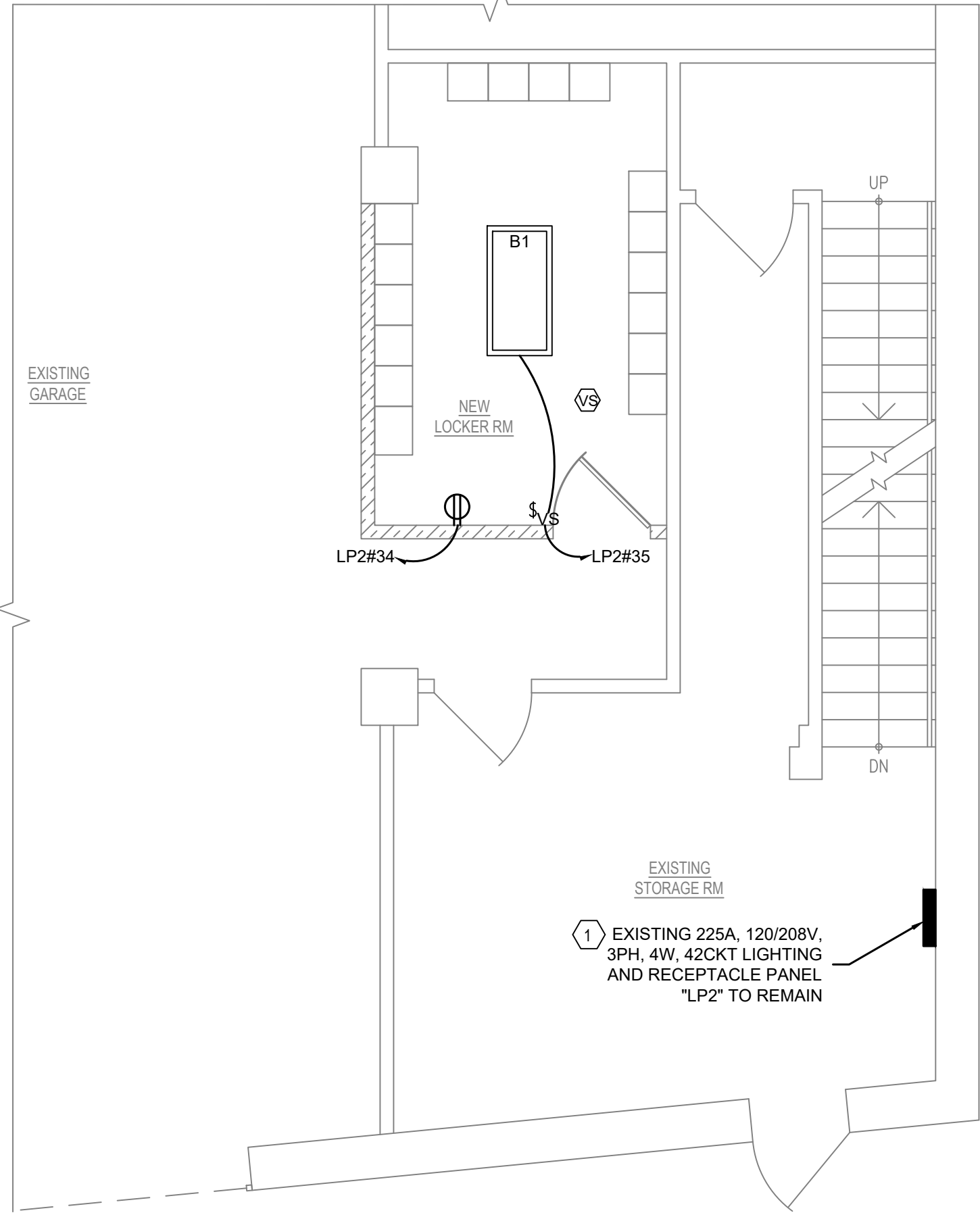
GPI Engineering Design Planning Construction Management
845.368.4050 GPINET.COM
Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901



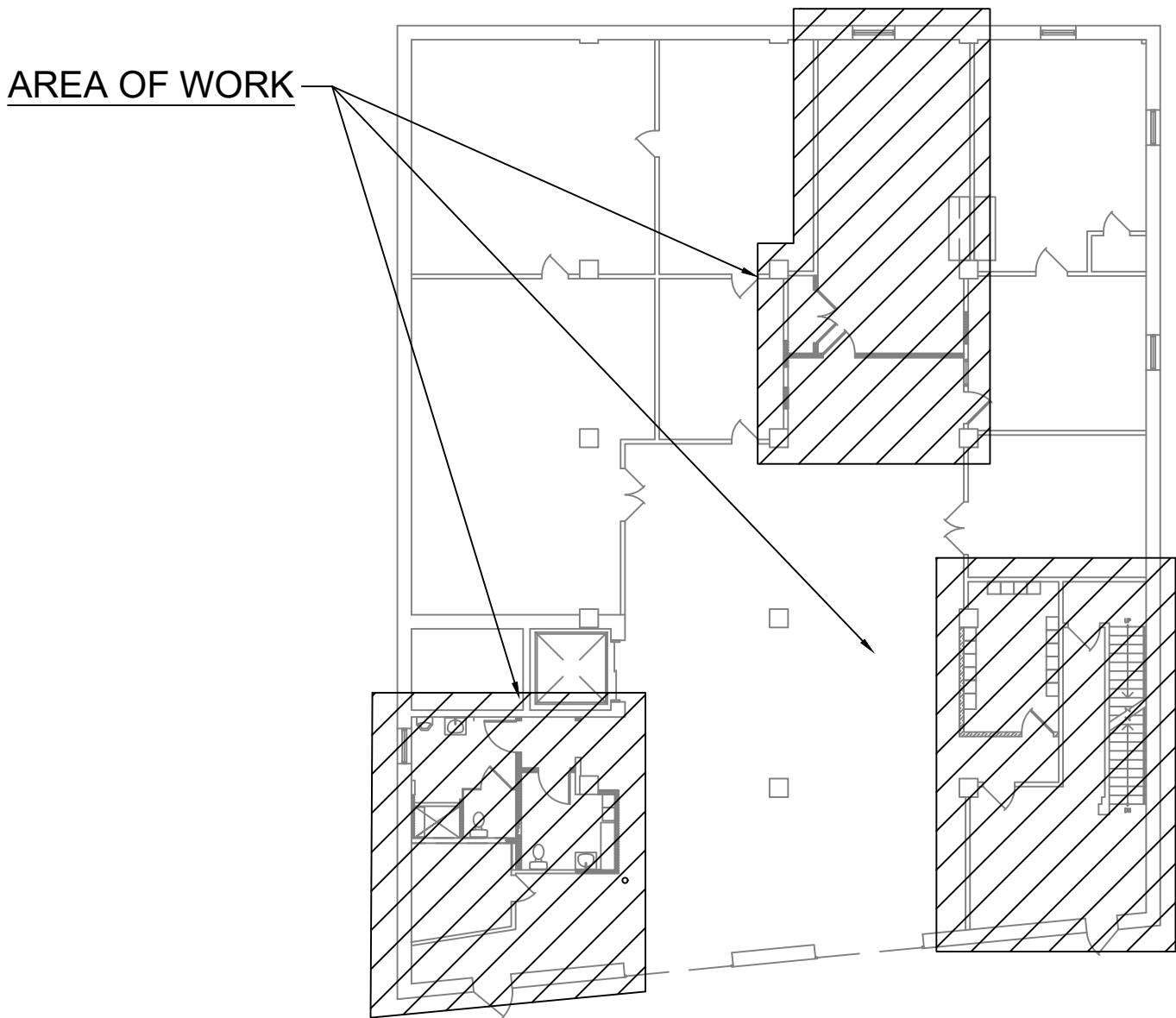
1 FIRST FLOOR PROPOSED PARTIAL PLAN
SCALE - 1/8" = 1'-0"



3 FIRST FLOOR PROPOSED PARTIAL PLAN
SCALE - 1/4" = 1'-0"



2 FIRST FLOOR PROPOSED PARTIAL PLAN
SCALE - 1/4" = 1'-0"



4 FIRST FLOOR KEY PLAN
SCALE - N.T.S.

KEYED NOTES:

- EXISTING 225A, 120/208V, 3 PH, 4W PANEL "LP2" TO REMAIN. PROVIDE (5)-20A 1P CIRCUIT BREAKER TO FEED THE NEW CIRCUITS.
- NEW LOCATION OF EXISTING CAMERA AFTER RELOCATION. EXTEND EXISTING CONDUIT AND PROVIDE NEW WIRES (CAT6 OR EQUIVALENT) FROM SOURCE FOR COMPLETE OPERATION OF THE CAMERA. FINAL LOCATION SHALL BE COORDINATED AT FIELD WITH OWNER OR AS PER MANUFACTURERS RECOMMENDATION.

NO.	DATE	REVISION
1	10-06-23	COORDINATION SET

INTERIOR RENOVATIONS AT
40 PELHAM ROAD, NEW ROCHELLE
NEW YORK 10801

Element
Architectural Group

12 NORTH STATE ROUTE 17, SUITE 220, PARAMUS, NEW JERSEY 07652
PH 201.368.7752 FAX 201.368.7756 NJ LIC. AIO12156; NY LIC. 024305

ELECTRICAL INSTALLATION PLAN	JOB:	2023-12
	DATE:	10-06-23
	SCALE:	AS SHOWN
	DWN:	KAZUHIRO DAYO

M,E,P.&FP CONSULTANT:
GPI
845.368.4050
Greenman-Pedersen, Inc.
2 Executive Boulevard, Suite 202
Suffern, NY 10901









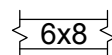


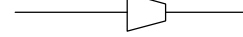





Engineering
Design
Planning
Construction Management
GPINET.COM

E-101.00

DWG. X OF 4

THIS PAGE INTENTIONALLY LEFT BLANK

SYMBOL & ABBREVIATIONS

SYMBOL	ABBREVIATION	DESCRIPTION	SYMBOL	ABBREVIATION	DESCRIPTION
-	AC-	AIR CONDITIONING UNIT		-	TEE UP
-	AD	ACCESS DOOR		-	ELBOW UP
-	AFF	ABOVE FINISHED FLOOR		-	FLOW ARROW
-	AHC	ABOVE HUNG CEILING		EX.	EXISTING TO REMAIN
-	AHU-	AIR HANDLING UNIT		REL.	REMOVE AND RELOCATE
-	AP	ACCESS PANEL		NEW	NEW WORK
-	BDD	BACKDRAFT DAMPER		DEM.	EXISTING TO BE REMOVED
-	BHP	BRAKE HORSEPOWER	GENERAL NOTES		
-	BTU	BRITISH THERMAL UNIT			
-	CFM	CUBIC FEET PER MINUTE	<p>1. CONTRACT DRAWINGS, AS FAR AS THEY RELATE TO THE GENERAL ARRANGEMENT AND LOCATION OF EQUIPMENT, SHEET METAL, AND PIPING, SHALL BE UNDERSTOOD AS DIAGRAMMATIC. ANY CHANGES TO EQUIPMENT, SHEET METAL, AND PIPING LOCATIONS NECESSARY TO AVOID INTERFERENCE WITH OTHER TRADES SHALL BE MADE AT NO EXTRA COST, AND MUST BE APPROVED BY THE ENGINEER.</p> <p>2. THE MECHANICAL CONTRACTOR SHALL INSTALL FIRE DAMPERS WITH ACCESS DOORS IN ALL DUCTS PENETRATING FIRE RATED WALLS, WHETHER SPECIFICALLY SHOWN ON THE DRAWINGS OR NOT.</p> <p>3. PROVIDE ALL PIPE OPENINGS THROUGH PARTITIONS WITH PIPE SLEEVES. FOR PIPES PENETRATING FIRE RATED PARTITIONS, THE SPACE BETWEEN THE PIPE AND THE SLEEVE SHALL BE SEALED WITH FIRE STOPPING MATERIAL. PENETRATIONS FOR PIPING SHALL BE MADE BY CORE DRILLING WHENEVER POSSIBLE.</p> <p>4. THE MECHANICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO THE BEGINNING OF WORK, AND SHALL COORDINATE ALL WORK WITH OTHER TRADES.</p> <p>5. THE MECHANICAL CONTRACTOR SHALL NOTE THAT, IN ADDITION TO THE SPECIFICATIONS AND DETAILS GIVEN IN THESE PLANS FOR PIPE HANGERS AND SUPPORTS, ALL HANGERS AND SUPPORTS SHALL BE DESIGNED AND INSTALLED IN COMPLIANCE WITH APPLICABLE SEISMIC CODES.</p> <p>6. THE MECHANICAL CONTRACTOR SHALL SUBMIT FOR REVIEW A COMPOSITE SHOP DRAWING.</p> <p>7. ALL WORK SHALL COMPLY WITH STATE BUILDING CODE, LOCAL BUILDING CODE, AND ENERGY CODE REQUIREMENTS. IN CASE OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND A GOVERNING CODE OR ORDINANCE, THE MORE STRINGENT STANDARD SHALL APPLY.</p> <p>8. THE OWNER'S PERMANENT HVAC EQUIPMENT SHALL NOT BE USED BY ANY CONTRACTOR DURING CONSTRUCTION FOR TEMPORARY HEATING, COOLING, OR VENTILATION. IF TEMPORARY HEATING, COOLING, OR VENTILATION IS REQUIRED AT ANY POINT DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TEMPORARY HEATING, COOLING, OR VENTILATION EQUIPMENT, DUCTWORK, CONTROLS, AND POWER AT HIS OWN EXPENSE.</p> <p>9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY VENTILATION AND EXHAUST AIR WHEN WELDING OR SOLDERING OPERATIONS ARE PERFORMED, AS REQUIRED BY OSHA.</p> <p>10. WHERE BUILDING STRUCTURAL COMPONENTS HAVE FIREPROOF MATERIAL, ANY AREA THAT IS DISTURBED OR DAMAGED AS A RESULT OF MECHANICAL WORK, INCLUDING THE INSTALLATION OF HANGERS FOR PIPING, DUCTWORK, OR EQUIPMENT, SHALL BE PATCHED WITH UL AND FM APPROVED FIREPROOFING TO MATCH EXISTING.</p> <p>11. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL NECESSARY PERMITS AND FOR PAYING RELATED FEES.</p>		
-	CL	CENTERLINE			
-	CP-	CONDENSATE PUMP			
-	DB	DRY BULB TEMPERATURE			
-	DIA. OR Ø	DIAMETER			
-	DX	DIRECT EXPANSION			
-	EA	EXHAUST AIR			
-	EAT	ENTERING AIR TEMPERATURE			
-	EF-	EXHAUST FAN			
-	EL	ELEVATION			
-	ER	EXHAUST REGISTER			
-	ESP	EXTERNAL STATIC PRESSURE			
-	FCU-	FAN COIL UNIT			
-	FPM	FEET PER MINUTE			
-	FPS	FEET PER SECOND			
-	GPM	GALLONS PER MINUTE			
-	HP-	HEAT PUMP			
-	HP	HORSE POWER			
-	HV-	HEATING AND VENTILATING UNIT			
-	HVAC-	HEATING, VENTILATING AND AIR CONDITIONING UNIT			
-	KX-	KITCHEN EXHAUST			
-	LAT	LEAVING AIR TEMPERATURE			
-	LF	LINEAR FEET			
-	LWT	LEAVING WATER TEMPERATURE			
-	MBH	1000 BRITISH THERMAL UNITS PER HOUR			
-	MER	MECHANICAL EQUIPMENT ROOM			
-	NC	NORMALLY CLOSED			
-	NIC	NOT IN CONTRACT			
-	OAI	OUTSIDE AIR INTAKE			
-	PSI	POUNDS PER SQUARE INCH			
-	RA	RETURN AIR			
-	RPM	REVOLUTIONS PER MINUTE			
-	SA	SUPPLY AIR			
-	SP	STATIC PRESSURE			
-	TSP	TOTAL STATIC PRESSURE			
-	TYP.	TYPICAL			
-	U.O.N.	UNLESS OTHERWISE NOTED			
-	WB	WET BULB TEMPERATURE			
-	WG	INCHES OF WATER GAUGE			
-	WMS	WIRE MESH SCREEN			
	AL	ACOUSTIC LINING			
	-	DUCT SIZE - 1ST FIGURE IS SIDE SHOWN			
	FC	FLEXIBLE CONNECTION			
	VD	VOLUME DAMPER			
	-	DUCT TRANSITION			
	-	MOTORIZED DAMPER			
	-	EXHAUST REGISTER			
	-	AIR INTO REGISTER			
	-	TEE DOWN			
	-	ELBOW DOWN			

HANGER SPACING SCHEDULE			
PIPING MATERIAL	SIZE (IN.)	MAXIMUM HORIZONTAL SPACING (FT.)	MAXIMUM VERTICAL SPACING (FT.)
COPPER PIPE	ALL	12	15

NOTES:

A.) THE MAXIMUM HORIZONTAL SPACING OF CAST-IRON PIPE HANGERS SHALL BE INCREASED TO 10 FT. WHERE 10 FOOT LENGTHS OF PIPE ARE INSTALLED.

B.) FOR SIZES 2 IN. AND SMALLER, A GUIDE SHALL BE INSTALLED MIDWAY BETWEEN REQUIRED VERTICAL SUPPORTS. SUCH GUIDES SHALL PREVENT PIPE MOVEMENT IN A DIRECTION PERPENDICULAR TO THE AXIS OF THE PIPE

C.) HANGERS, ANCHORS AND SUPPORTS SHALL SUPPORT THE PIPING AND THE CONTENTS OF THE PIPING. HANGERS AND STRAPPING MATERIAL SHALL BE OF APPROVED MATERIAL THAT WILL NOT PROMOTE GALVANIC ACTION.

HANGER ROD SCHEDULE		
PIPING MATERIAL	PIPE SIZE (IN.)	HANGER ROD DIAMETER (IN.)
TYPE L COPPER	½"-1"	⅜"
	1¼"-3"	½"
<p>NOTES:</p> <p>a.) THE MAXIMUM HORIZONTAL SPACING OF CAST-IRON PIPE HANGERS SHALL BE INCREASED TO 10 FT. WHERE 10 FOOT LENGTHS OF PIPE ARE INSTALLED.</p> <p>b.) FOR SIZES 2 IN. AND SMALLER, A GUIDE SHALL BE INSTALLED MIDWAY BETWEEN REQUIRED VERTICAL SUPPORTS. SUCH GUIDES SHALL PREVENT PIPE MOVEMENT IN A DIRECTION PERPENDICULAR TO THE AXIS OF THE PIPE</p>		

CONDENSATE DRAIN SIZING	
EQUIPMENT CAPACITY	MINIMUM CONDENSATE DRAIN PIPE DIAMETER (IN.)
UP TO 20 TONS OF REFRIGERATION	¾"
OVER 20 TONS OF REFRIGERATION	1"

NOTES:
 FOR SI: 1"=25.4mm, 1 TON OF CAPACITY=3.517 kW

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU·IN/(H·FT ² ·°F) ^B	MEAN RATING TEMPERATURE, °F	< 1	1 TO < 1½	1½ TO < 4	4 TO < 8	≥ 8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1.0	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	50	0.5	1.0	1.0	1.0	1.5

MECHANICAL PIPE MATERIAL SCHEDULE							
PIPE SYSTEM	SIZE	PIPE			FITTINGS		
		MATERIAL	TYPE / WEIGHT	STANDARD	MATERIALS	TYPE / WEIGHT	STANDARD
CONDENSATE DRAIN	ALL	COPPER	HARD TEMPER TYPE L	ASTM B88	COPPER	WROUGHT COPPER SOLDER JOINT	ANSI 16.18
REFRIGERANT	ALL	COPPER	HARD TEMPER TYPE K (ACR)	ASTM 280	COPPER	SILVER SOLDER 300 PSI	ANS B16.22



OLA Consulting Engineers

50 Broadway,
Hawthorne, NY 10532
914.747.2800

8 West 38th Street,
Suite 501
New York, NY 10018
646.849.4110

www.ola.com

CLIENT

CITY OF NEW ROCHELLE
DEPT. OF PUBLIC WORKS
515 NORTH AVENUE
NEW ROCHELLE, NEW YORK

1	ISSUED FOR BID	10/06/23
No.	ISSUE OR REVISION	DATE

No use, reproduction or dissemination may be made of this drawing and the concepts set forth without the prior written consent of OLA Consulting Engineers, PC. Copyright © 2023

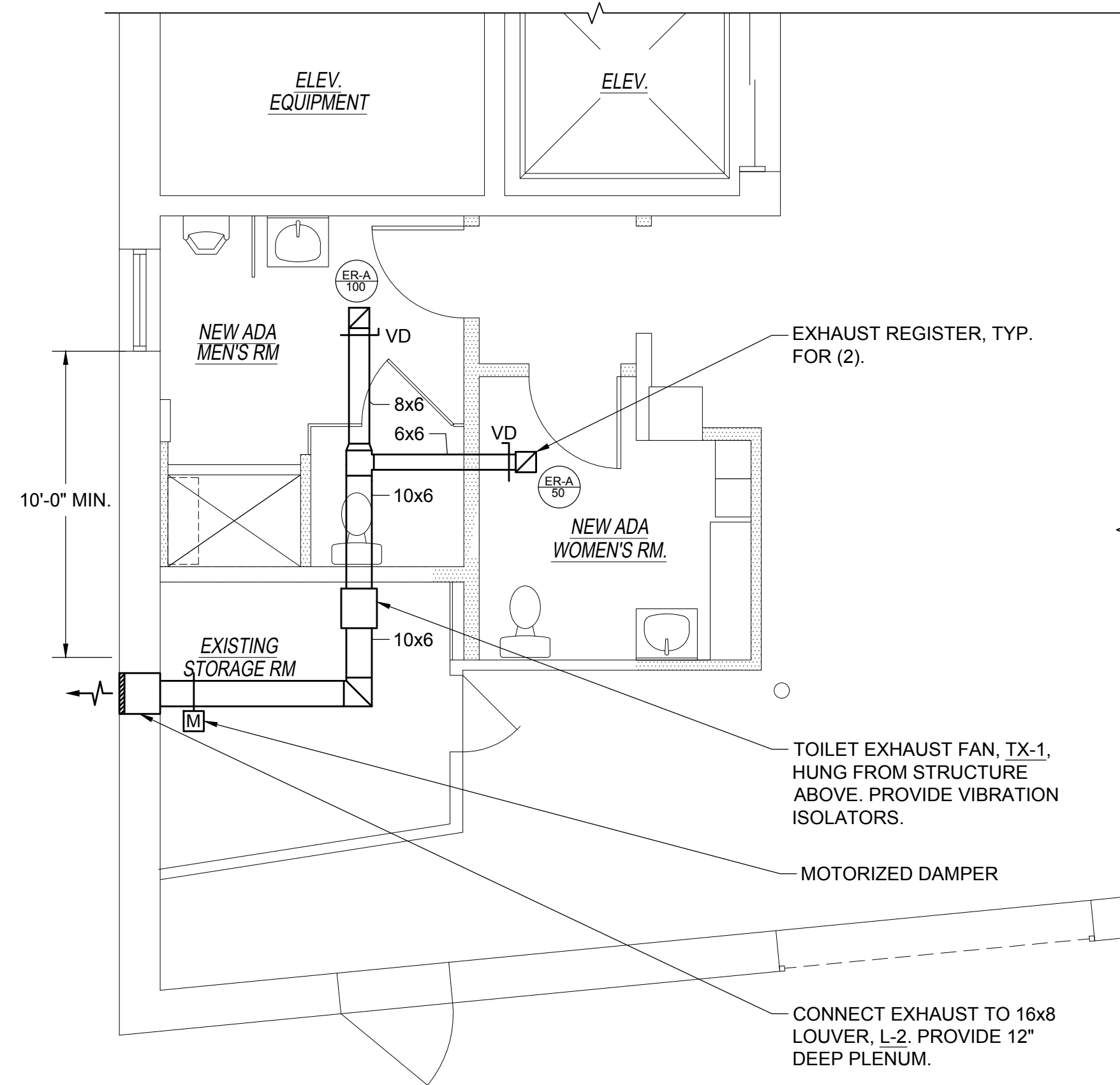
PROJECT TITLE

INTERIOR RENOVATION PROJECT
40 PELHAM ROAD
NEW ROCHELLE, NY 10801

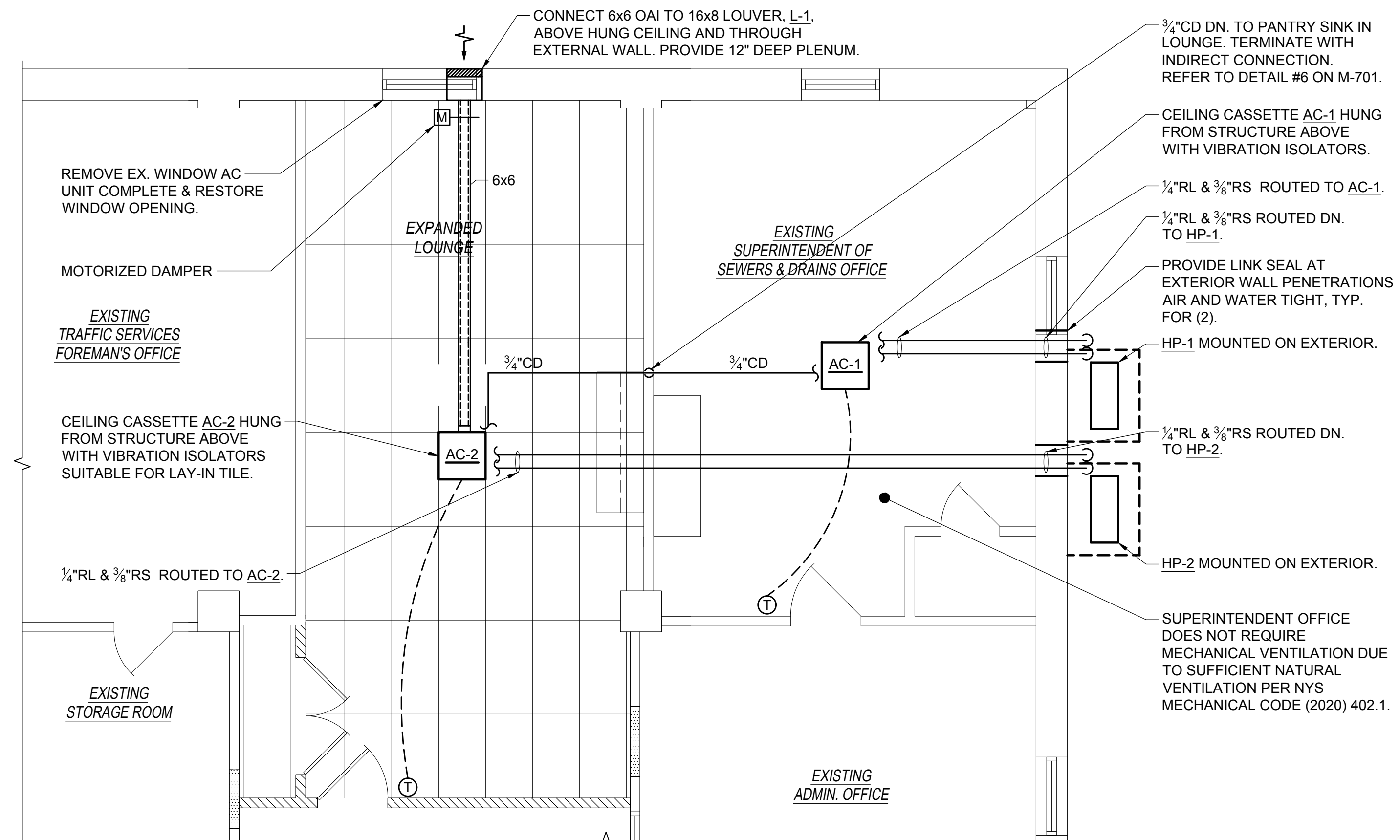
DRAWING TITLE

MECHANICAL SYMBOLS,
ABBREVIATIONS, NOTES, AND
SCHEDULES

SEAL	SCALE AS NOTED	PROJECT NO. NCNR0006.01
	DRAWN BY MN	DRAWING NO. M-001
	CHECKED BY CED	
	DATE 10/06/23	

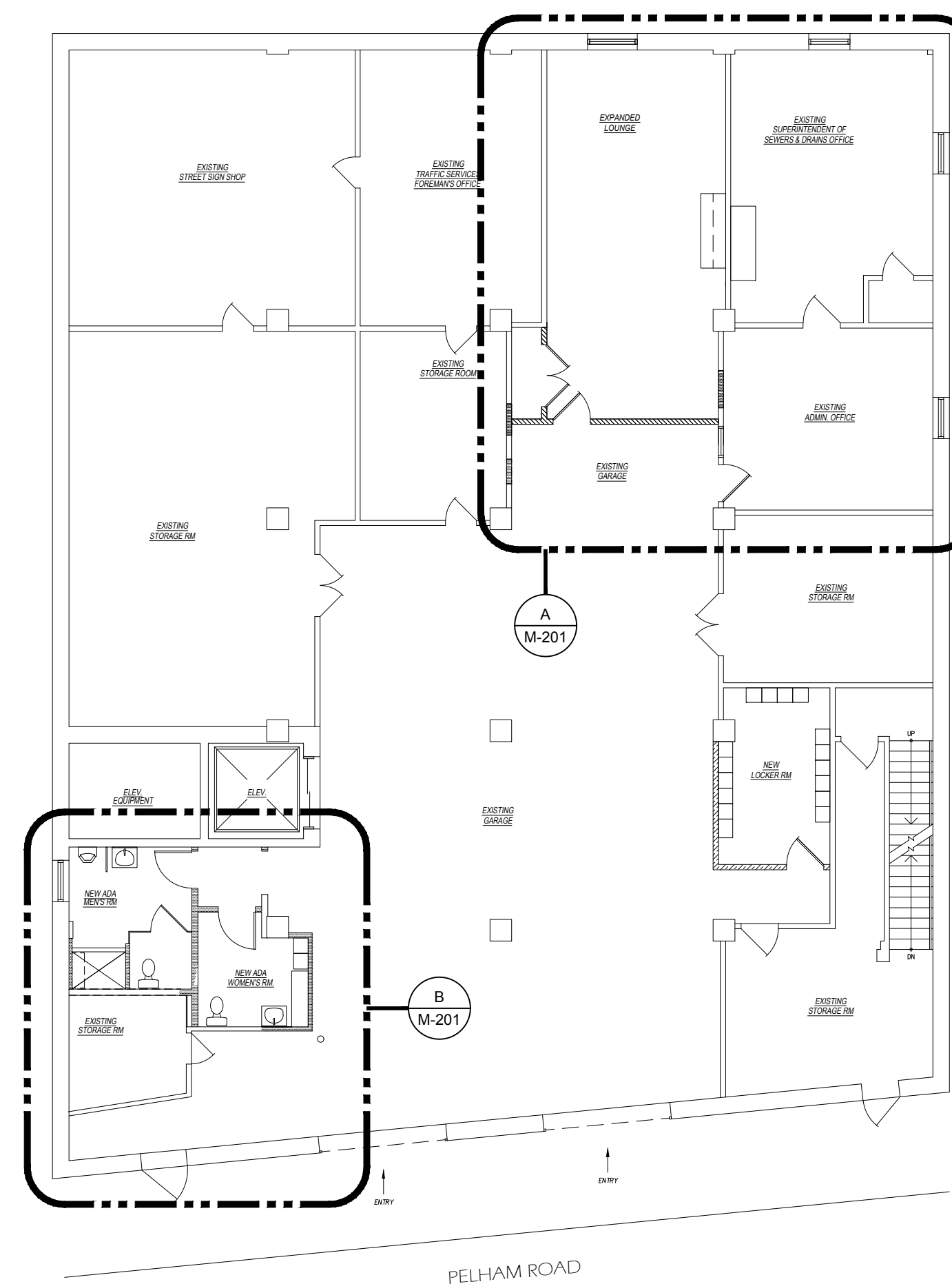


 3 MECHANICAL FIRST LEVEL PART PLAN B
SCALE: 1/4" = 1'-0"



 2 MECHANICAL FIRST LEVEL PART PLAN A
SCALE: 1/4" = 1'-0"

ADD/ALTERNATE:
1. ALL WORK ASSOCIATED WITH AC-1 AND HP-1 SHALL BE PRICED SEPARATELY. INCLUDING ALL ASSOCIATED REFRIGERANT PIPING, THERMOSTATS, OUTDOOR AIR DUCTWORK, EXTERIOR WALL PENETRATIONS, AND ALL REQUIRED MOUNTING HARDWARE AND SUPPORTS AS WELL AS THE REMOVAL OF THE EXISTING WINDOW AC UNIT.



 1 MECHANICAL FIRST LEVEL KEY PLAN
SCALE: 3/32" = 1'-0"

CLIENT

CITY OF NEW ROCHELLE
DEPT. OF PUBLIC WORKS
515 NORTH AVENUE
NEW ROCHELLE, NEW YORK

1	ISSUED FOR BID	10/06/23
No.	ISSUE OR REVISION	DATE

No use, reproduction or dissemination may be made of this drawing and the concepts set forth without the prior written consent of OLA Consulting Engineers, PC. Copyright © 2023

PROJECT TITLE

INTERIOR RENOVATION PROJECT
40 PELHAM ROAD
NEW ROCHELLE, NY 10801

DRAWING TITLE

MECHANICAL
FIRST LEVEL PART PLANS

SEAL	SCALE	PROJECT NO.
	AS NOTED	NCNR0006.01
	DRAWN BY MN	DRAWING NO.
	CHECKED BY CED	M-201
	DATE 10/06/23	

LOUVER SCHEDULE		
DESIGNATION	L-1	L-2
LOCATION	SEE PLANS	SEE PLANS
AREA SERVED	LOUNGE	BATHROOMS
MODEL	ESD-202	ESD-345
FREE AREA	0.20	0.29
DIMENSIONS (WxH)	16x8	12x12

NOTES:

1. LOUVERS BASED ON GREENHECK.
2. COORDINATE EXACT LOUVER SIZE WITH ARCHITECTURAL PLANS AND WITH WALL OPENINGS IN THE FIELD.
3. ALL LOUVERS SHALL BE STATIONARY, DRAINABLE BLADE WITH 45° BLADE ANGLE.
4. CUSTOM COLORED LOUVERS SHALL BE SELECTED BY ARCHITECT. SUBMIT COLOR CHART FOR REVIEW.
5. FURNISH 1/2" GALVANIZED BIRD SCREEN FOR ALL LOUVERS.
6. BLANK OFF UNUSED SECTIONS OF LOUVERS WITH SHEET METAL PANELS. PAINT PANELS TO MATCH LOUVER AND INSULATE WITH 1" RIDGED BOARD INSULATION.

TOILET EXHAUST FAN SCHEDULE	
DESIGNATION	TX-1
AREA SERVED	SEE PLANS
MODEL	SP-A390-VG
WEIGHT (lbs)	25
CFM	150
WATTS	29
SP (IN H ₂ O)	0.5
VOLTS/Hz/Ø	115/60/1
FLA (A)	1.5
INTERLOCK	TIMECLOCK

NOTES:

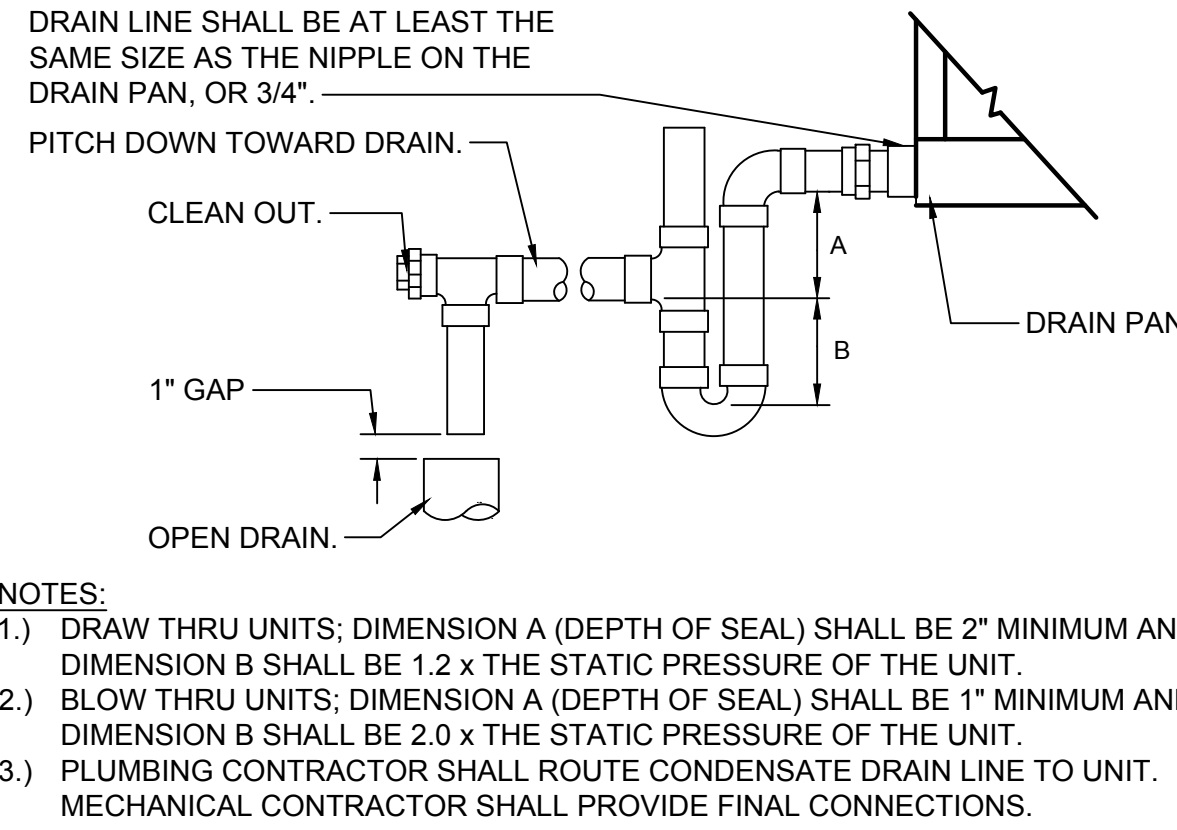
1. FANS SUPPLIED ON GREENHECK.
2. PROVIDE SPEED CONTROLLER FOR BALANCING.
3. DISCONNECT SWITCH SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
4. PROVIDE BACKDRAFT DAMPERS AND VIBRATION ISOLATORS.

EQUIPMENT NOTES

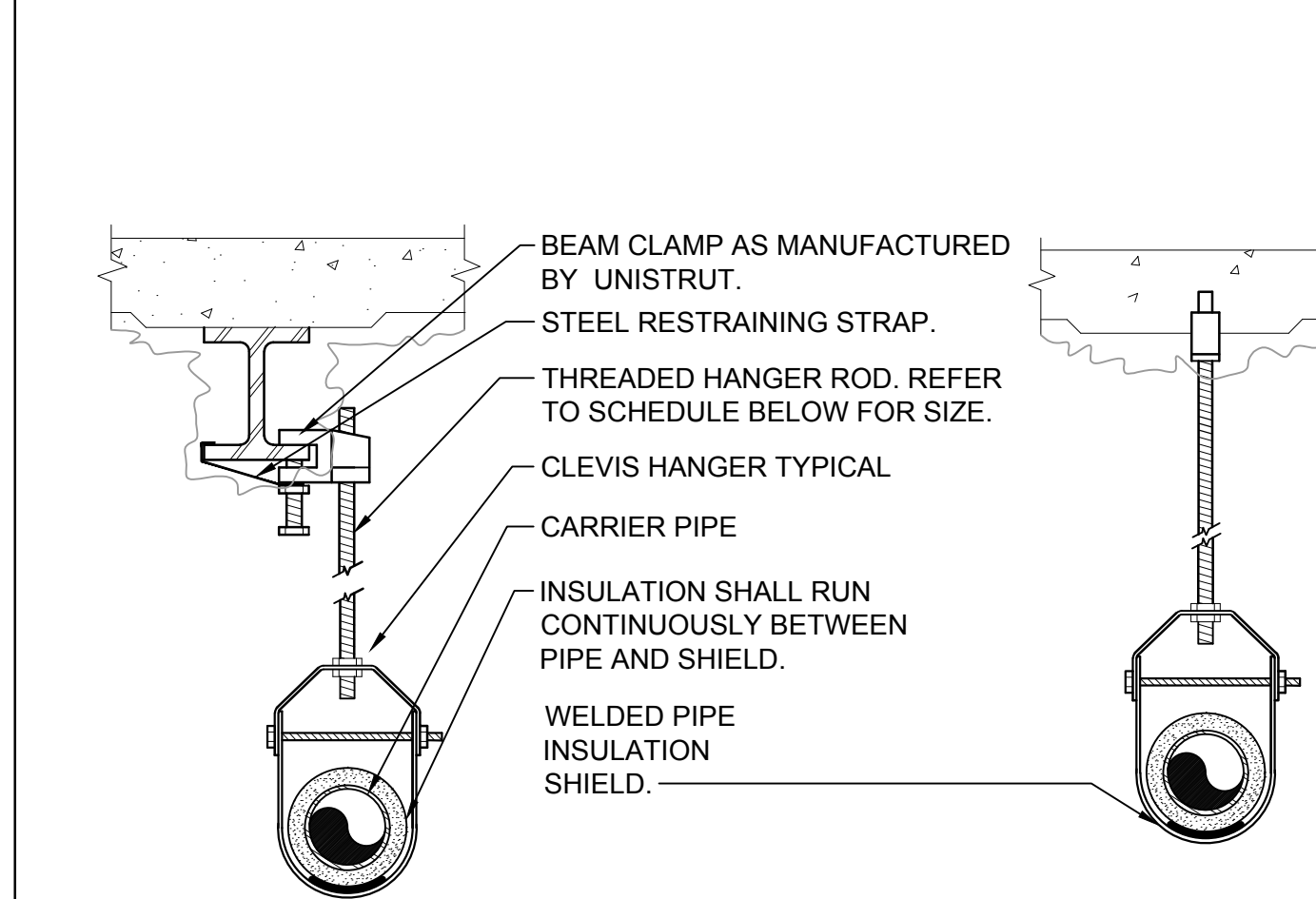
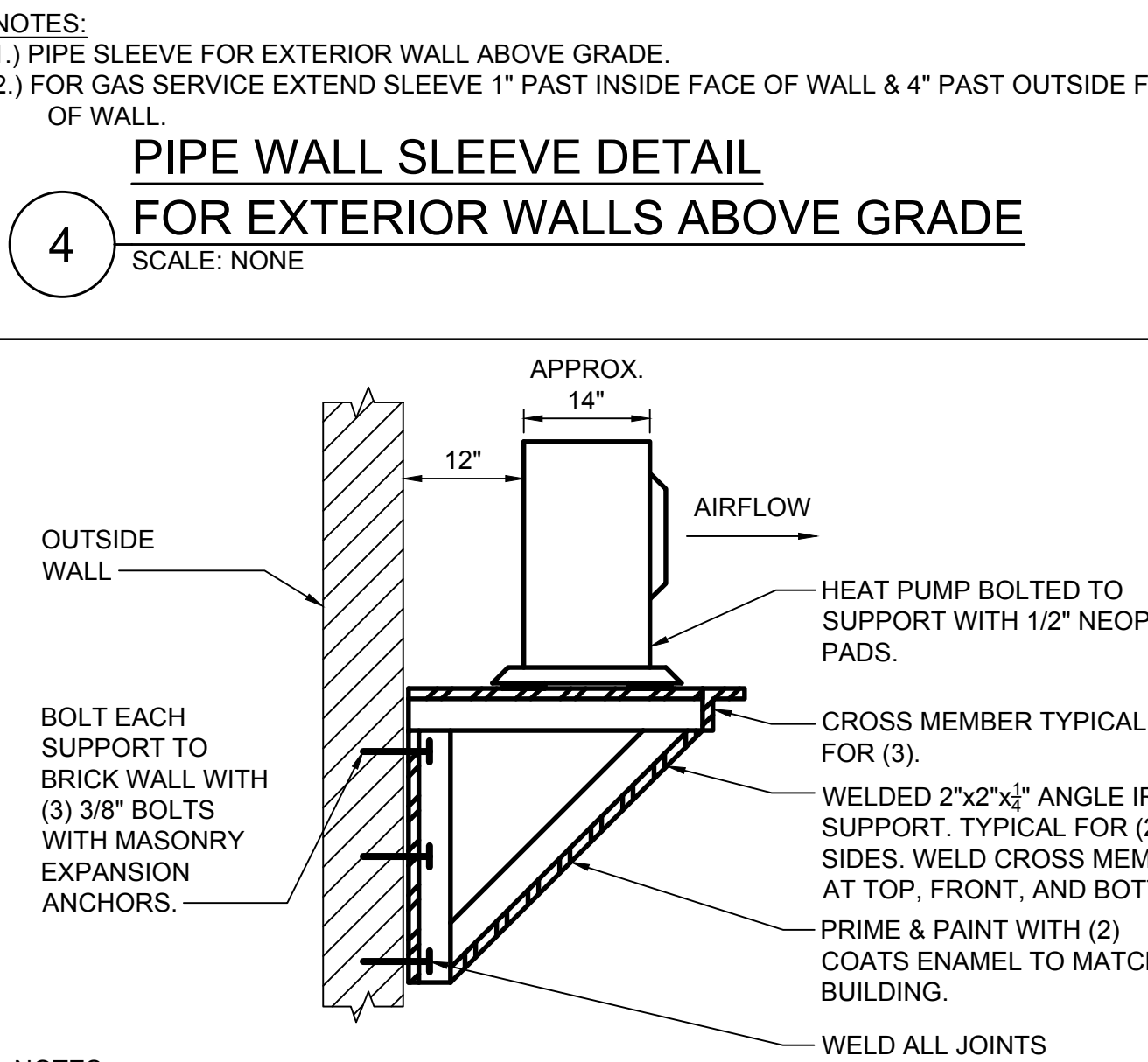
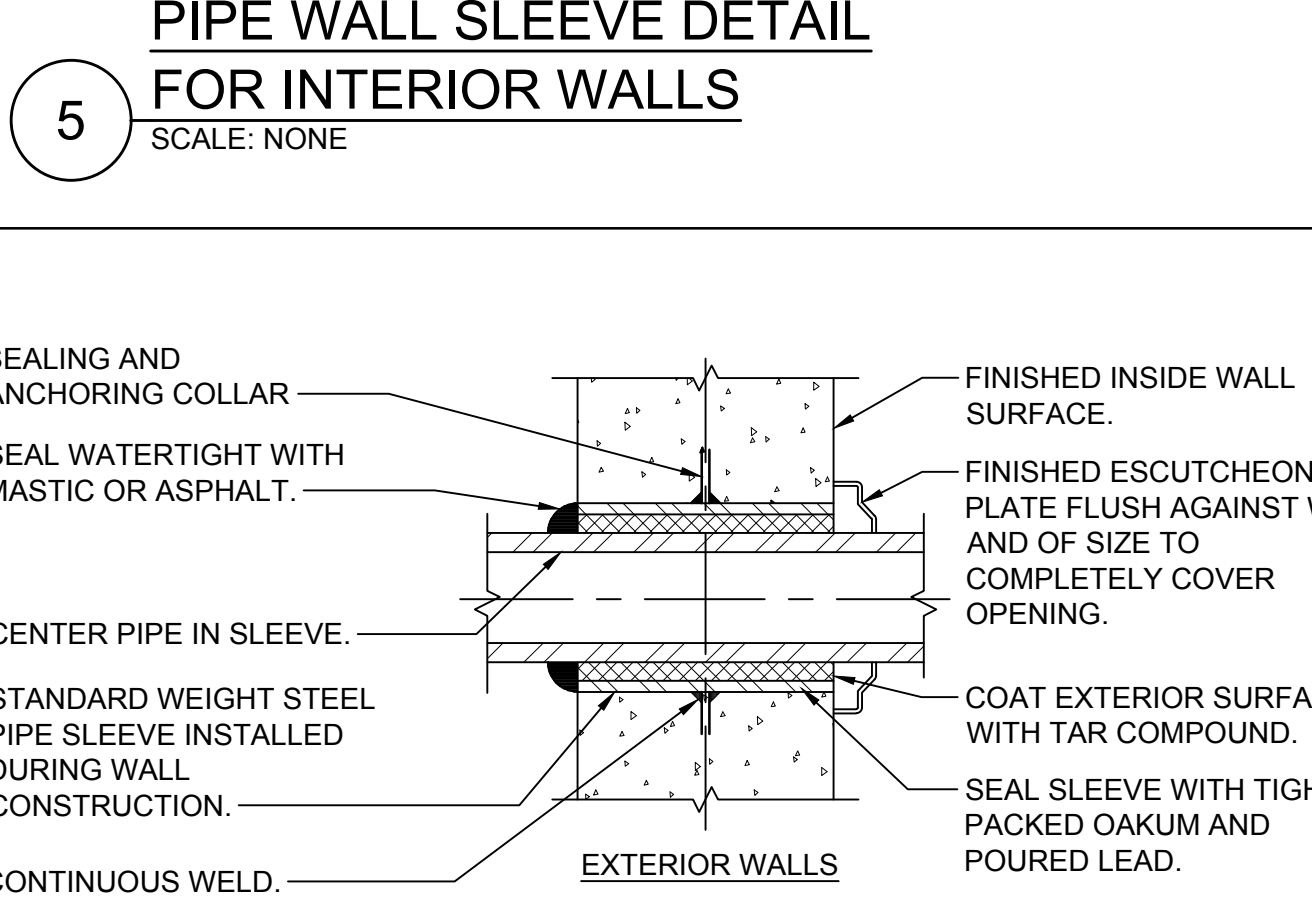
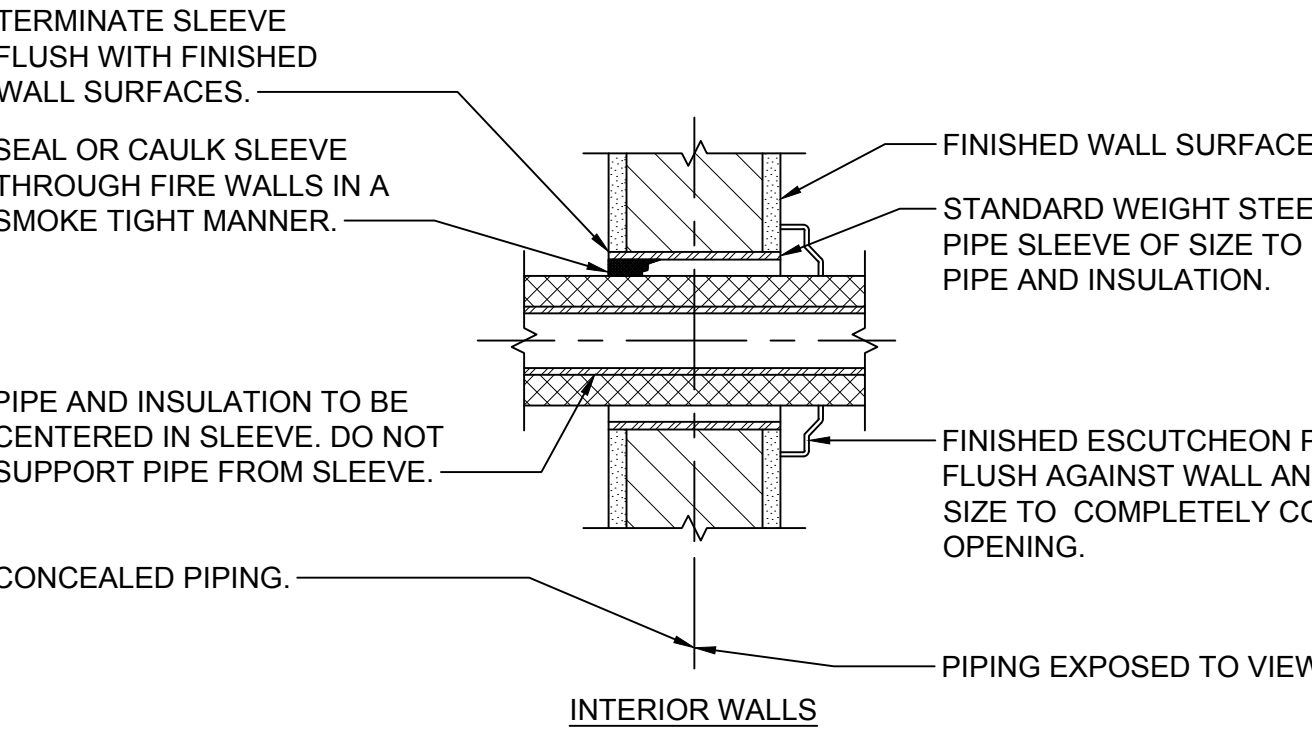
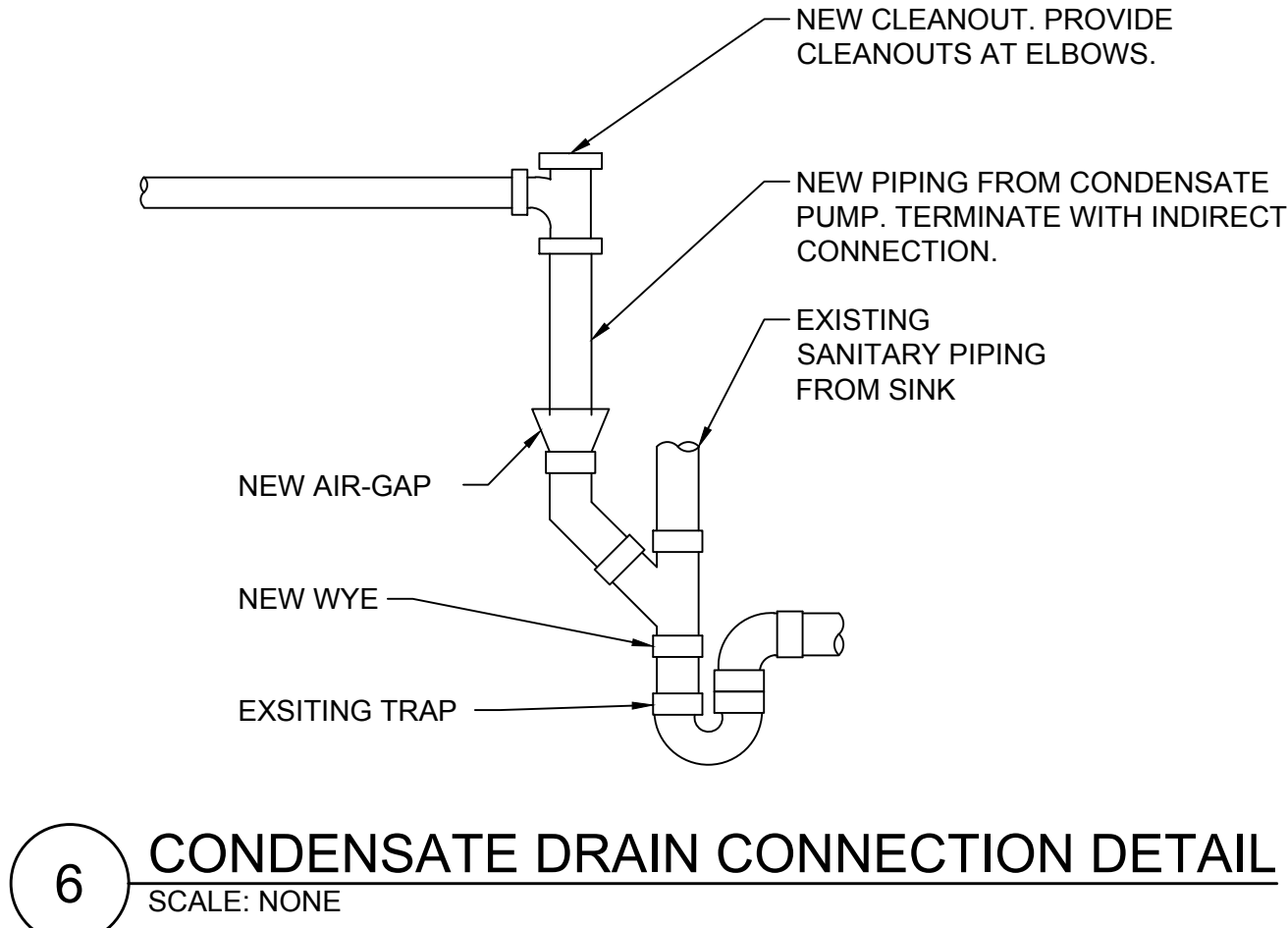
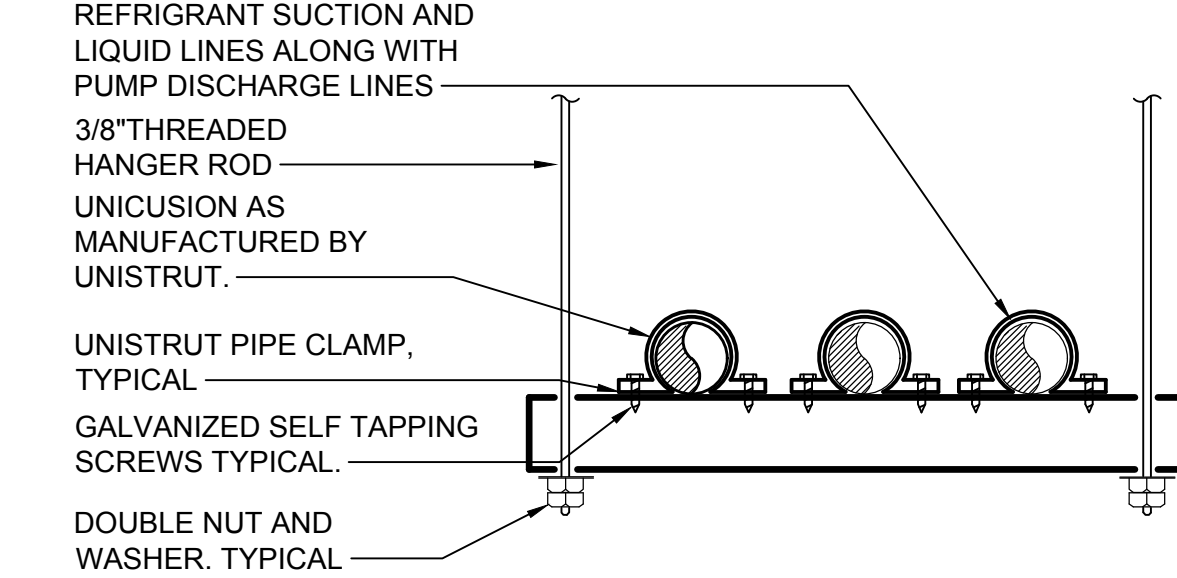
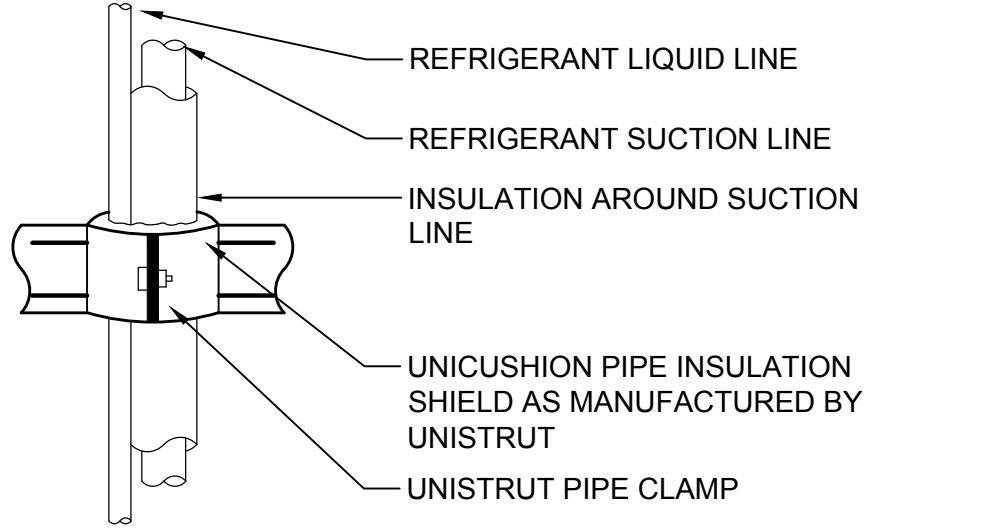
VOLUME CONTROL DAMPERS: FOR ALL ROUND & RECTANGULAR VOLUME CONTROL DAMPERS THAT ARE LOCATED ABOVE INACCESSIBLE CEILINGS, PROVIDE CABLE OPERATED DAMPERS. ROUND DAMPERS SHALL BE YOUNG BOWDEN MODEL 5020-CC. RECTANGULAR DAMPERS SHALL BE MODEL 830-CC2. CABLE CONTROLS SHALL BE MODEL 270-275 FOR CONCEALED LOCATIONS & MODEL 270-896C FOR LOCATIONS WHERE CABLES TERMINATE IN FINISHED SPACES. COORDINATE LOCATIONS IN THE FIELD.

MOTORIZED DAMPERS SHALL BE RUSKIN MODEL CD40, 4" DEEP EXTRUDED ALUMINUM AIRFLOW DAMPER. DAMPER SHALL HAVE OPPOSED BLADES, MOTOR AND LINKAGE. DAMPERS SHALL BE 120V/1 ϕ /60HZ, 3 AMPS MAX. FURNISH DISCONNECT SWITCH.

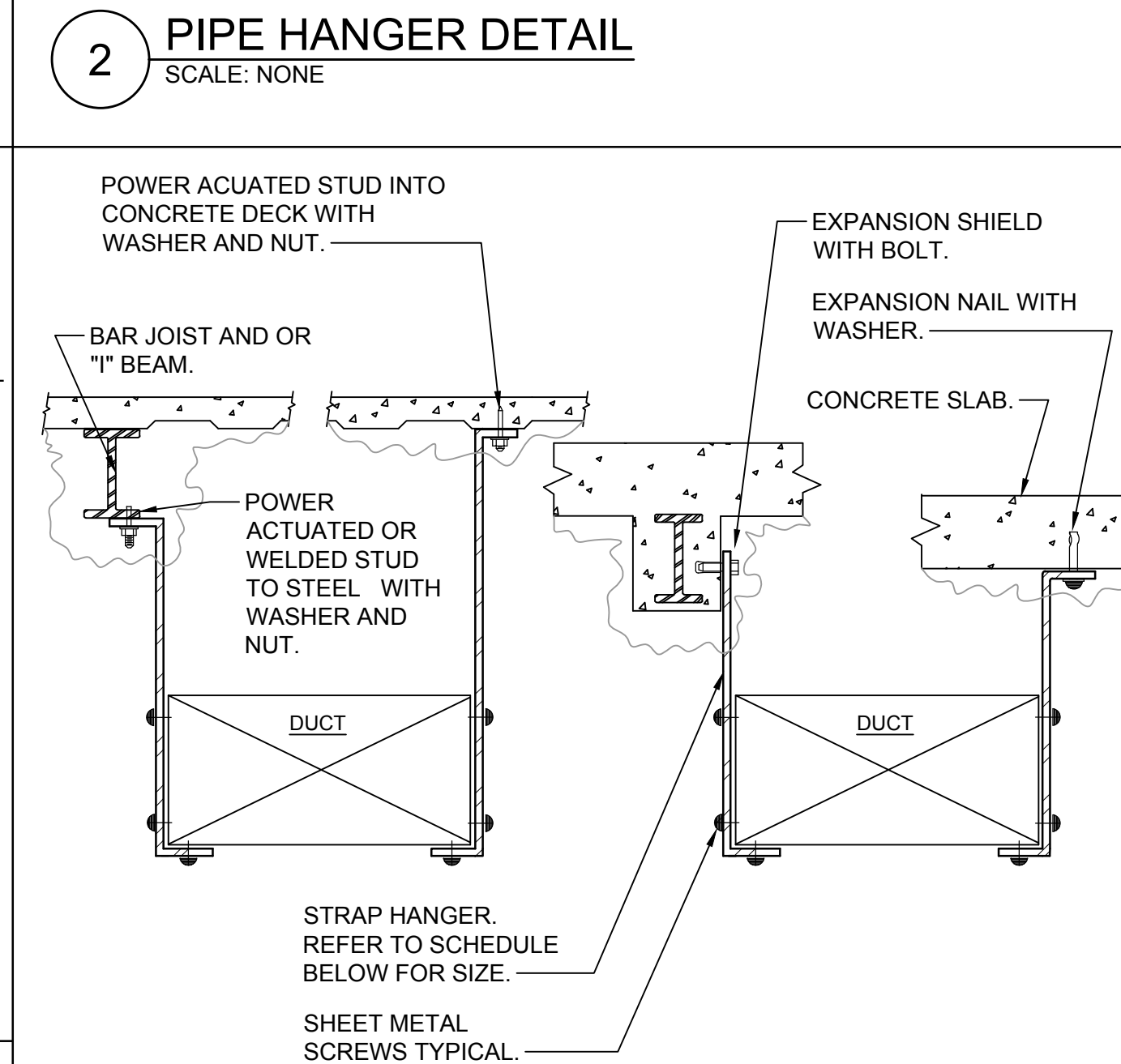
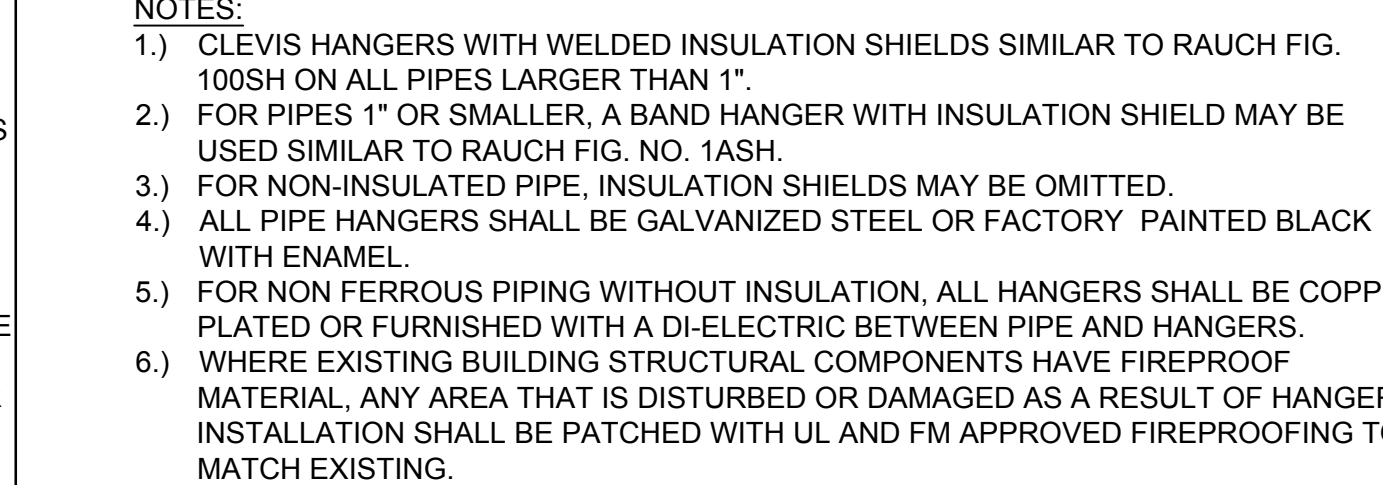
VIBRATION ISOLATORS: ALL INDOOR AND OUTDOOR HVAC EQUIPMENT SHALL BE MOUNTED ON SPRING VIBRATION ISOLATORS, WITH A RATED STATIC DEFLECTION OF AT LEAST 1". USE MASON TYPE "SLF" OR "SLFH" FOR FLOOR MOUNTED EQUIPMENT, RATED FOR MACHINE LOAD. USE MASON TYPE "30" OR "W30" FOR EQUIPMENT SUSPENDED FROM CEILING. ASSUMING THE EQUIPMENT IS MOUNTED TO PROVIDE FOR EQUAL LOAD DISTRIBUTION, EACH SPRING SHALL BE RATED FOR 1/4 THE UNIT'S TOTAL WEIGHT. SYSTEMS MUST BE ENGINEERED FOR 95% ISOLATION EFFICIENCY AT THE LOWEST ROTATIONAL SPEED OF THE UNIT.



DUCTLESS SPLIT-SYSTEM AC UNIT SCHEDULE				
INDOOR/OUTDOOR UNIT DESIGNATION	HP-1	HP-2	AC-1	AC-2
MANUFACTURER	LG	LG	LG	LG
MODEL NUMBER	LUU127HV	LUU127HV	LCN128HV4	LCN128HV4
LOCATION	MOUNTED ON EXTERIOR	MOUNTED ON EXTERIOR	SUPERINTENDENT OFFICE	LOUNGE
COOLING CAPACITY MIN/RATED/MAX (BTU/HR)	3,400 / 11,100 / 12,400	3,400 / 11,100 / 12,400	3,400 / 11,100 / 12,400	3,400 / 11,100 / 12,400
HEATING CAPACITY MIN/RATED/MAX (BTU/HR)	2,800 / 14,000 / 15,500	2,800 / 14,000 / 15,500	2,800 / 14,000 / 15,500	2,800 / 14,000 / 15,500
SEER / EER	19.4 / 12.6	19.4 / 12.6	-	-
HSPF	10.35	10.35	-	-
REFRIGERANT TYPE	R410A	R410A	R410A	R410A
RS PIPE SIZE (IN)	3/8"	3/8"	3/8"	3/8"
RL PIPE SIZE (IN)	1/4"	1/4"	1/4"	1/4"
CONDENSATE DRAIN PIPE SIZE (IN)	-	-	3/4"	3/4"
CFM H/M/L	-	-	335 / 283 / 247	335 / 283 / 247
HEIGHT x WIDTH x DEPTH (IN)	21 1/32 x 30 3/16 x 13 29/32	21 1/32 x 30 3/16 x 13 29/32	24 1/32 x 24 1/32 x 9 19/64	24 1/32 x 24 1/32 x 9 19/64
WEIGHT (LBS)	89	89	40	40
ELECTRICAL DATA:				
VOLTS/Ø/Hz	208-230 / 1 / 60	208-230 / 1 / 60	208-230 / 1 / 60	208-230 / 1 / 60
MCA (AMPS)	12.3	12.3	POWERED BY OUTDOOR UNIT	POWERED BY OUTDOOR UNIT
MOCP (AMPS)	15	15	POWERED BY OUTDOOR UNIT	POWERED BY OUTDOOR UNIT




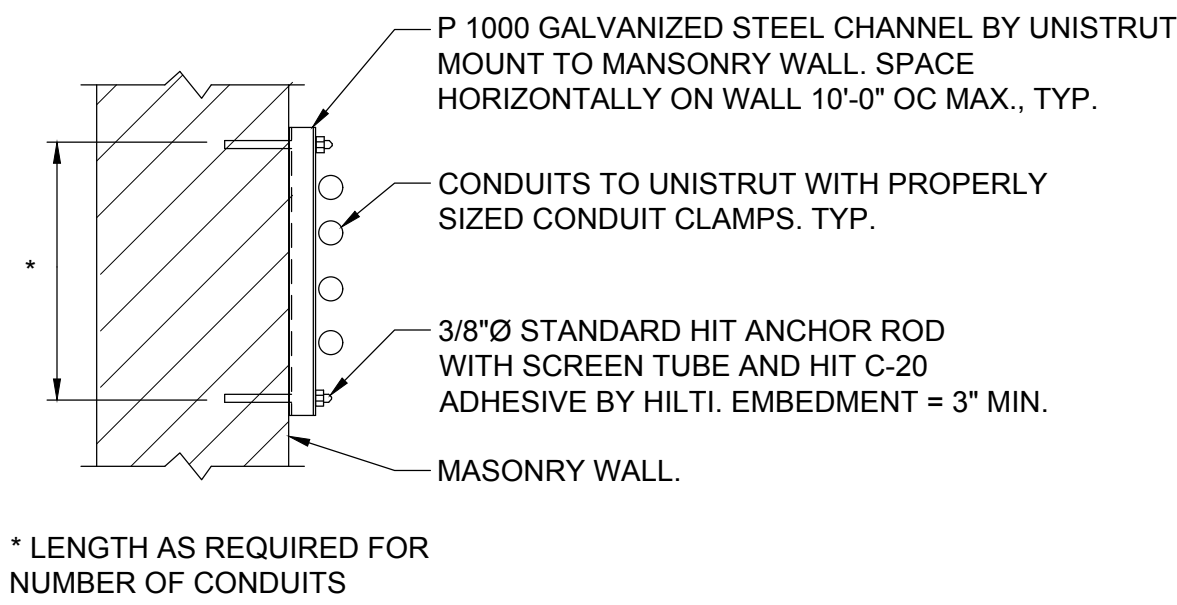
PIPE HANGER SCHEDULE					
PIPE DIA.	3/4"-2"	2 1/2"-3"	4"-5"	6"	8"-12"
HANGER DIA.	3/8"	1/2"	5/8"	3/4"	7/8"



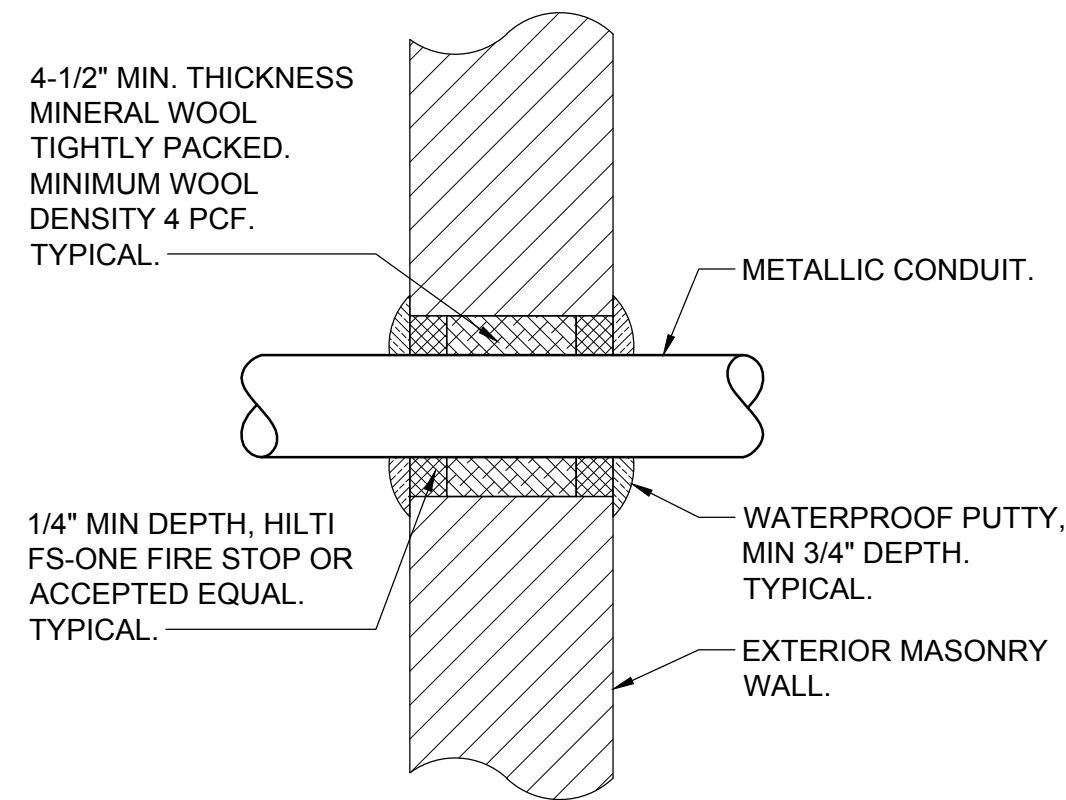
HANGER STRAP SCHEDULE		
DUCT SIZE	HANGER SIZE	MAXIMUM SPACING
UP TO 2 SQ. FT.	1" x $\frac{1}{16}$ "	8'-0"
2 SQ. FT. TO 4 SQ. FT.	1" x $\frac{3}{16}$ "	8'-0"
4 SQ. FT. TO 10 SQ. FT.	1" x $\frac{1}{2}$ "	6'-0"
OVER 10 SQ. FT.	1" x $\frac{3}{8}$ "	4'-0"



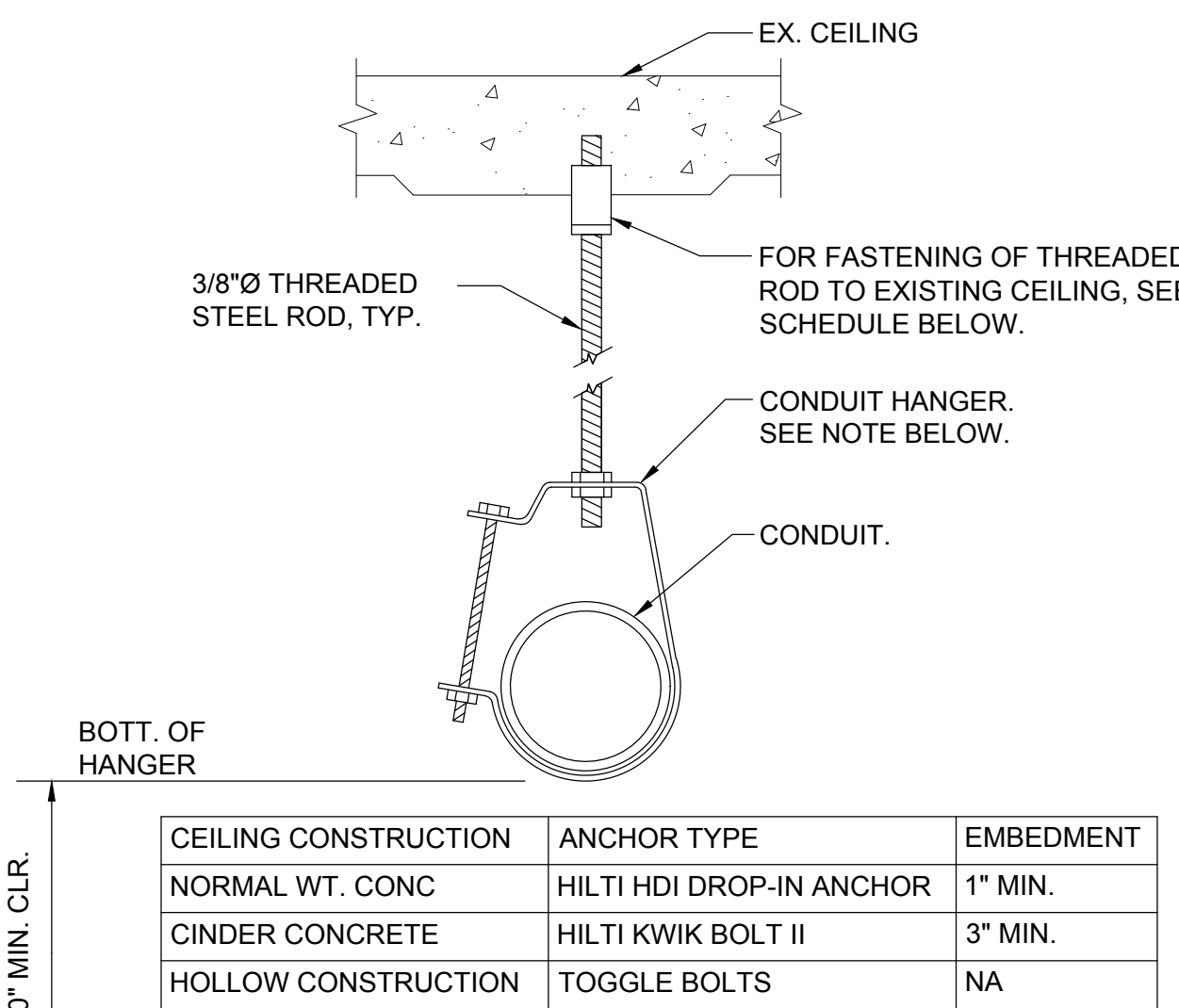
<div><div>OLA Consulting Engineers 50 Broadway, Hawthorne, NY 10532 914.747.2800 8 West 38th Street, Suite 501 New York, NY 10018 646.849.4110 olace.com</div></div>		
CLIENT		
CITY OF NEW ROCHELLE DEPT. OF PUBLIC WORKS 515 NORTH AVENUE NEW ROCHELLE, NEW YORK		
1	ISSUED FOR BID	10/06/23
No.	ISSUE OR REVISION	DATE
No use, reproduction or dissemination may be made of this drawing and the concepts set forth without the prior written consent of OLA Consulting Engineers, PC. Copyright © 2023		
PROJECT TITLE		
INTERIOR RENOVATION PROJECT 40 PELHAM ROAD NEW ROCHELLE, NY 10801		
DRAWING TITLE		
MECHANICAL DETAILS AND SCHEDULES		
SEAL	SCALE AS NOTED DRAWN BY MN CHECKED BY CED DATE 10/06/23	PROJECT NO. NCNR0006.01 DRAWING NO. M-701



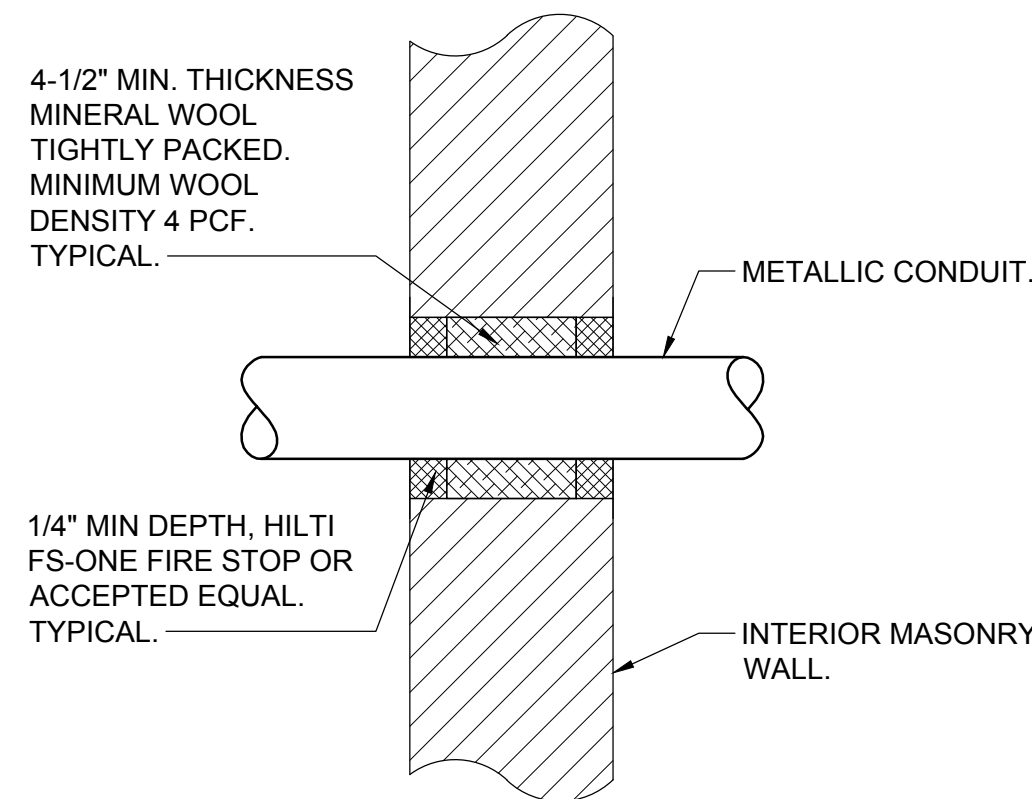
6 TYPICAL CONDUIT SUPPORT
ON MASONRY DETAIL
SCALE: NONE



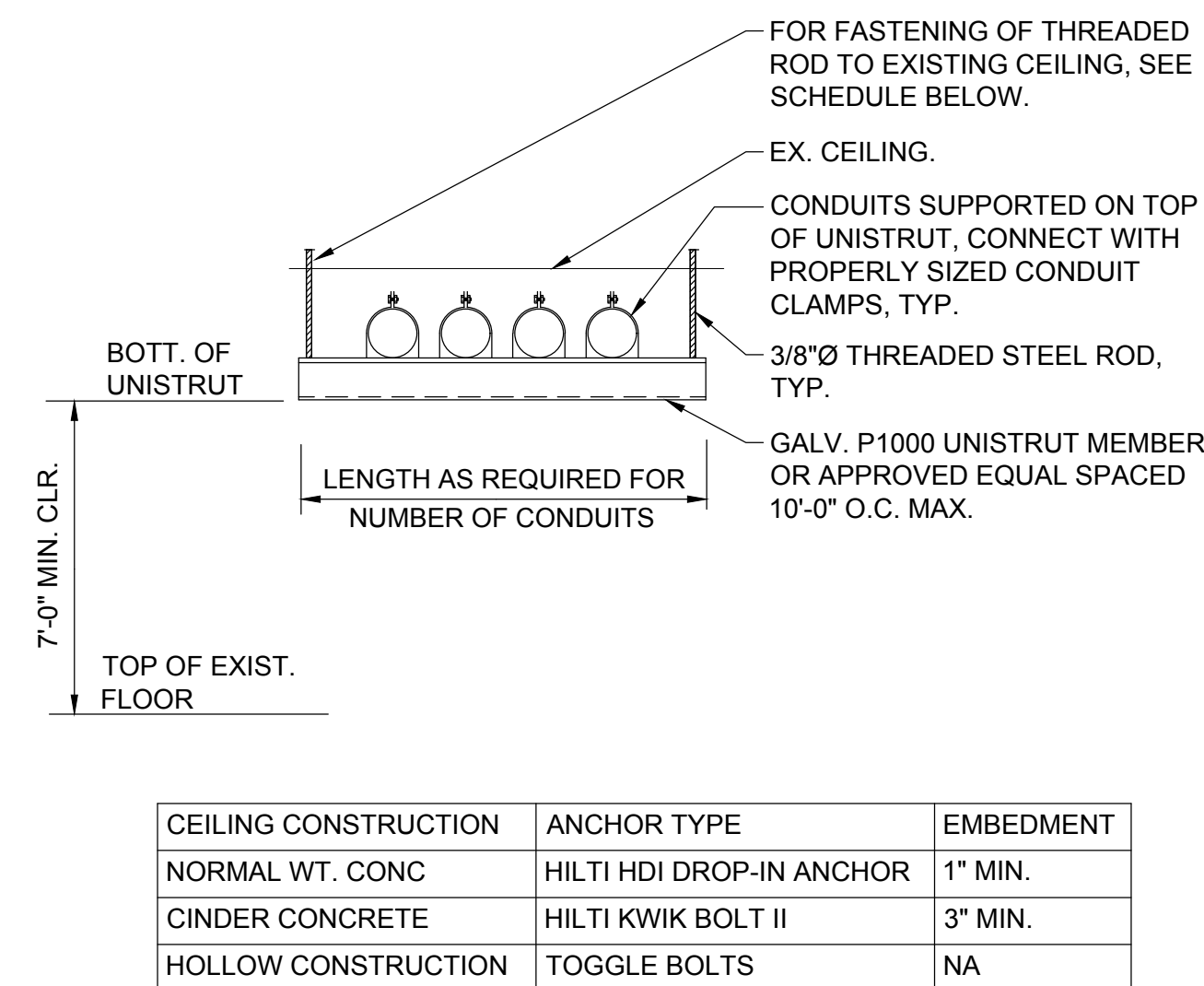
3 TYPICAL EXTERIOR MASONRY WALL ABOVE
GRADE CONDUIT PENETRATION DETAIL
SCALE: NONE



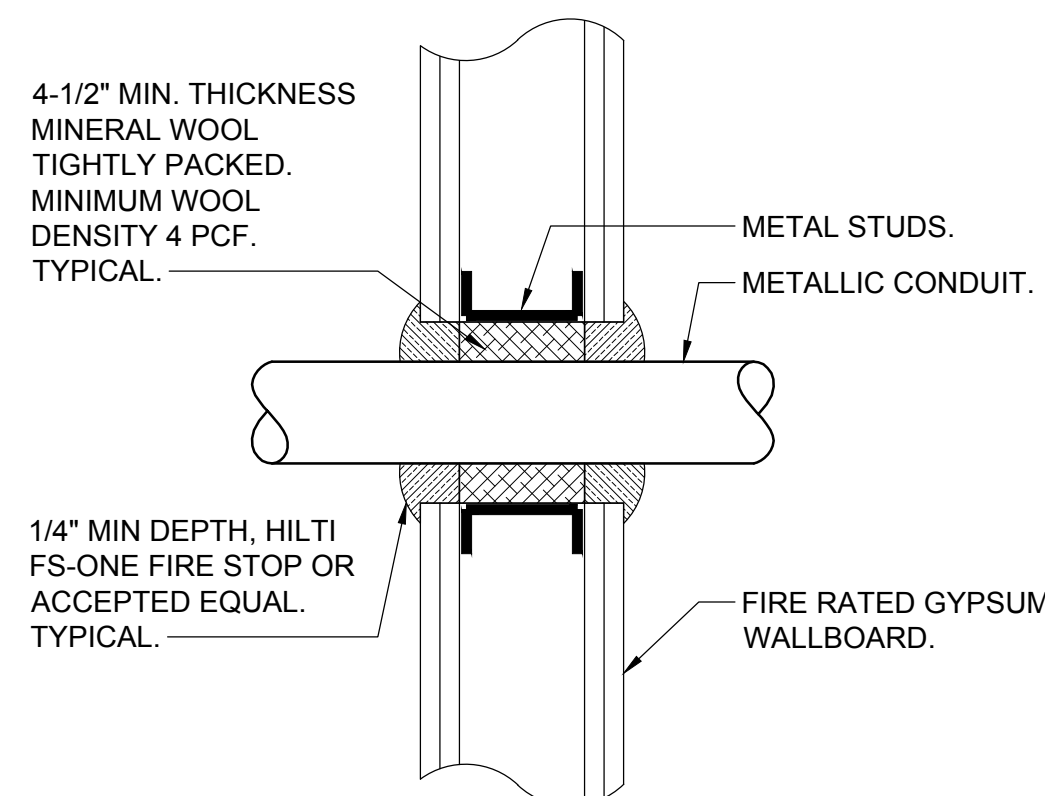
5 SINGLE CONDUIT HANGER DETAIL
SCALE: NONE



2 TYPICAL INTERIOR MASONRY WALL
CONDUIT PENETRATION DETAIL
SCALE: NONE



4 TRAPESE SUPPORT DETAIL
SCALE: NONE

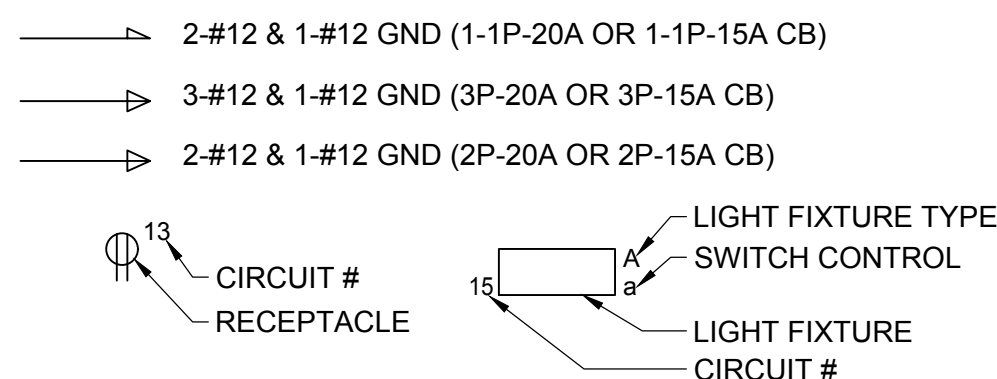


1 TYPICAL FIRE RATED GYPSUM WALL
CONDUIT PENETRATION DETAIL
SCALE: NONE

SYMBOLS AND ABBREVIATIONS

SYMBOL	ABBREVIATION	DESCRIPTION
	-	CONDUIT AND WIRING
	-	CONDUIT & WIRING TO BE REMOVED UON
	-	BURIED CONDUIT
	-	OVERHEAD CONDUCTORS
	-	HOMERUN TO PANEL, ARROWS INDICATE # 1P
	-	MULTI-POLE HOMERUN
	-	ELECTRICAL EQUIPMENT AS INDICATED
	-	ELECTRICAL EQUIPMENT TO BE REMOVED UON
	-	DUPLEX RECEPTACLE
	CB	CIRCUIT BREAKER
	-	FUSED SWITCH
	MD	MOTORIZED DAMPER
	A	AMPERE(S)
	AC	AIR CONDITIONER
	ACC	AIR CONDITIONER CONDENSER
	AFF	ABOVE FINISHED FLOOR
	AWG	AMERICAN WIRE GAUGE
	BCW	BARE COPPER WIRE
	BLDG	BUILDING
	C	CONDUIT
	CKT	CIRCUIT
	CLG	CEILING
	CU	COPPER
	DISC	DISCONNECT
	DWG	DRAWING
	EX.	EXISTING TO REMAIN
	F	FLOOR
	FBO	FURNISHED BY OTHERS
	GFI	GROUND FAULT INTERRUPTER
	KVA	KILO-VOLT-AMPERE
	KW	KILO-WATT
	MAX	MAXIMUM
	MCB	MAIN CIRCUIT BREAKER
	MIN	MINIMUM
	MLO	MAIN LUG ONLY
	NTS	NOT TO SCALE
	PBO	PROVIDED BY OTHERS
	PNL	PANEL
	SCH	SCHEDULE
	SW	SWITCH(ES)
	TYP	TYPICAL
	V	VOLT(S)
	WG	WIRE GUARD
	WP	WEATHERPROOF

TYPICAL BRANCH CIRCUIT WIRING LEGEND



- NOTES:
1. EACH 120V AND 277V CIRCUIT SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR. SHARED NEUTRAL HOMERUNS ARE NOT PERMITTED.
 2. CONDUCTORS SHALL BE INCREASED FOR VOLTAGE DROP AND DERATING AS PER APPLICABLE ELECTRICAL CODE. FOR CIRCUITS THAT ARE BETWEEN 100' AND 150' IN LENGTH, PHASE AND NEUTRAL CONDUCTORS SHALL BE #10 AWG. FOR CIRCUITS THAT ARE BETWEEN 150' AND 225' IN LENGTH, PHASE AND NEUTRAL CONDUCTORS SHALL BE #8 AWG. FOR LENGTHS GREATER THAN 225' IN LENGTH, VERIFY CONDUCTOR SIZES WITH ENGINEER.

DEFINITION OF TERMS

1. WHEREVER IN THE CONTRACT DOCUMENTS THE WORD "CLIENT" IS USED, IT MUST BE UNDERSTOOD THAT "CITY OF NEW ROCHELLE" IS INTENDED.
2. WHEREVER IN THE CONTRACT DOCUMENTS THE WORD "ENGINEER" IS USED, IT MUST BE UNDERSTOOD THAT "OLA CONSULTING ENGINEERS" IS INTENDED.
3. "WORK" MUST BE DEEMED TO CONSIST OF ALL LABOR AND OPERATIONS, TRANSPORTATION, HOISTING, MATERIALS, TOOLS, EQUIPMENT, SERVICES, INSPECTIONS, INVESTIGATIONS, COORDINATION AND SUPERVISION REQUIRED AND / OR REASONABLY NECESSARY TO PRODUCE THE CONSTRUCTION REQUIRED BY THE CONTRACT DOCUMENTS.
4. "FURNISH" MEANS THE DESIGN, FABRICATION, PURCHASE AND DELIVERY TO THE JOB SITE.
5. "INSTALL OR INSTALLATION" MEANS THE ACT OF PHYSICALLY PLACING, APPLYING, SETTING, ERECTING, ANCHORING, SECURING, ETC. CONSTRUCTION MATERIALS, EQUIPMENT, FURNISHINGS, APPLIANCES, AND SIMILAR ITEMS SPECIFIED AND FURNISHED AT THE JOB SITE. INSTALLATION OF SPECIFIED ITEMS MUST BE COMPLETE IN ALL RESPECTS.
6. "PROVIDE" MEANS TO FURNISH AND INSTALL CONSTRUCTION MATERIAL, EQUIPMENT, ETC. AS DEFINED ABOVE.
7. THE FOLLOWING ARE DEFINITIONS OF SHOP DRAWING STAMP ACTIONS:
 - A. "NO EXCEPTIONS TAKEN" MEANS THAT THE SHOP DRAWING IS CORRECT AS TO PERFORMANCE, CAPACITY, ETC. AND SUBSTANTIAL CONFORMANCE TO THE CONTRACT DRAWINGS AND SPECIFICATIONS. FABRICATION AND/OR PURCHASE MAY COMMENCE.
 - B. "MAKE CORRECTIONS NOTED" MEANS THAT THE SHOP DRAWING IS CORRECT AS TO PERFORMANCE, CAPACITY, ETC. AND SUBSTANTIAL CONFORMANCE TO THE CONTRACT DRAWINGS AND/OR SPECIFICATIONS, SUBJECT TO AND IN COMPLIANCE WITH THE ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWING. FABRICATION AND/OR PURCHASE MAY COMMENCE.
 - C. "AMEND AND RESUBMIT" MEANS THAT THE COMMENTS AND/OR CORRECTION ARE SO EXTENSIVE AND IMPORTANT THAT THE REVIEWER WANTS TO SEE HOW THE COMMENTS AND/OR CORRECTIONS ARE RESOLVED PRIOR TO RELEASE FOR FABRICATION AND/OR PURCHASE. FABRICATIONS AND/OR PURCHASE MAY NOT COMMENCE.
 - D. "REJECTED" MEANS THAT THE SHOP DRAWING DOES NOT COMPLY OR CONFORM TO THE CONTRACT DRAWINGS AND/OR SPECIFICATIONS. FABRICATION AND/OR PURCHASE MAY NOT COMMENCE.

NOTES:

1.) ALL SYMBOLS AND ABBREVIATIONS MAY NOT BE APPLICABLE FOR THIS PROJECT.

GENERAL NOTES

2. ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED (UON) EXISTING TO REMAIN (EX.).
3. THE DRAWINGS ARE TO BE CONSIDERED SCHEMATIC ONLY AND DO NOT NECESSARILY SHOW THE EXACT LOCATIONS AND DETAILS OF THE WORK TO BE INSTALLED.
4. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND PAYING ALL FEES ASSOCIATED WITH THIS WORK INCLUDING FILING WITH THE UTILITY COMPANY (AS REQUIRED), AND WITH LOCAL AUTHORITY HAVING JURISDICTION.
5. ALL CONDUCTORS SHALL BE COPPER UON "ON DRAWINGS".
6. ELECTRONIC FILES OF THE MECHANICAL AND ELECTRICAL DRAWINGS ARE AVAILABLE TO THE CONTRACTOR. THE ENGINEER MAY GRANT THE CONTRACTOR A LIMITED LICENSE TO MAKE A DERIVATIVE WORK OF THE DATABASE FOR THE PURPOSE OF SHOP DRAWINGS, SUBMITTALS AND AS-BUILT DRAWINGS. UPON REQUEST, THE ENGINEER SHALL PROVIDE A RELEASE FORM THAT MUST BE SIGNED AND RETURNED BY THE CONTRACTOR PRIOR TO RELEASE OF THE ELECTRONIC FILES.
7. CIRCUIT NUMBERS ARE FOR INFORMATION PURPOSES ONLY. ACTUAL CIRCUIT NUMBERS SHALL BE DETERMINED IN THE FIELD.
8. WHERE GFI RECEPTACLES ARE CIRCUITED WITH GENERAL CONVENIENCE RECEPTACLES, THE GFI RECEPTACLE SHALL BE THE LAST DEVICE ON THE CIRCUIT.
9. INSTALL CONDUIT EXPANSION FITTINGS AT ALL LOCATIONS WHERE CONDUITS CROSS BUILDING OR STRUCTURE EXPANSION JOINTS.
10. UNLESS OTHERWISE NOTED MOTOR RATED TOGGLE SWITCHES FOR MECHANICAL RETURN FANS AND AIR CONDITIONING UNITS SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE ALL WORK WITH THE MECHANICAL CONTRACTOR.
11. DISCONNECT SWITCHES FOR MOTORIZED DAMPERS AND CFSD/SD SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. SWITCHES NOT SHOWN ON PLANS.
12. EACH DUPLEX AND QUAD RECEPTACLE SHALL BE LABELED WITH THE CIRCUIT NUMBER WHICH IT SERVES. ALPHANUMERICS TO BE 1/8" HIGH AND BLACK ON CLEAR BACKGROUND. LABELS SHALL BE SELF ADHESIVE. IDENTIFY ASSOCIATED PANEL AND CIRCUIT NUMBER.
13. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CUTTING, PATCHING, PAINTING, AND FINAL RESTORATION REQUIRED TO FACILITATE THE DEMOLITION AND INSTALLATION OF ALL ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO PANELBOARDS, CONDUITS, WIRING, DEVICES, FIXTURES, ETC. INCLUDING ABOVE CEILINGS. CONTRACTOR TO REMOVE AND REPLACE CEILINGS, AND OPEN AND PATCH WALLS, AS REQUIRED TO EXECUTE THE ELECTRICAL WORK.



OLA Consulting Engineers

50 Broadway,
Hawthorne, NY 10532
914.747.2800

8 West 38th Street,
Suite 501
New York, NY 10018
646.849.4110

olace.com

CLIENT

CITY OF NEW ROCHELLE
DEPT. OF PUBLIC WORKS
515 NORTH AVENUE
NEW ROCHELLE, NEW YORK

1	ISSUED FOR BID	10/06/23
No.	ISSUE OR REVISION	DATE

No use, reproduction or dissemination may be made of this drawing and the concepts set forth without the prior written consent of OLA Consulting Engineers, PC. Copyright © 2023

PROJECT TITLE

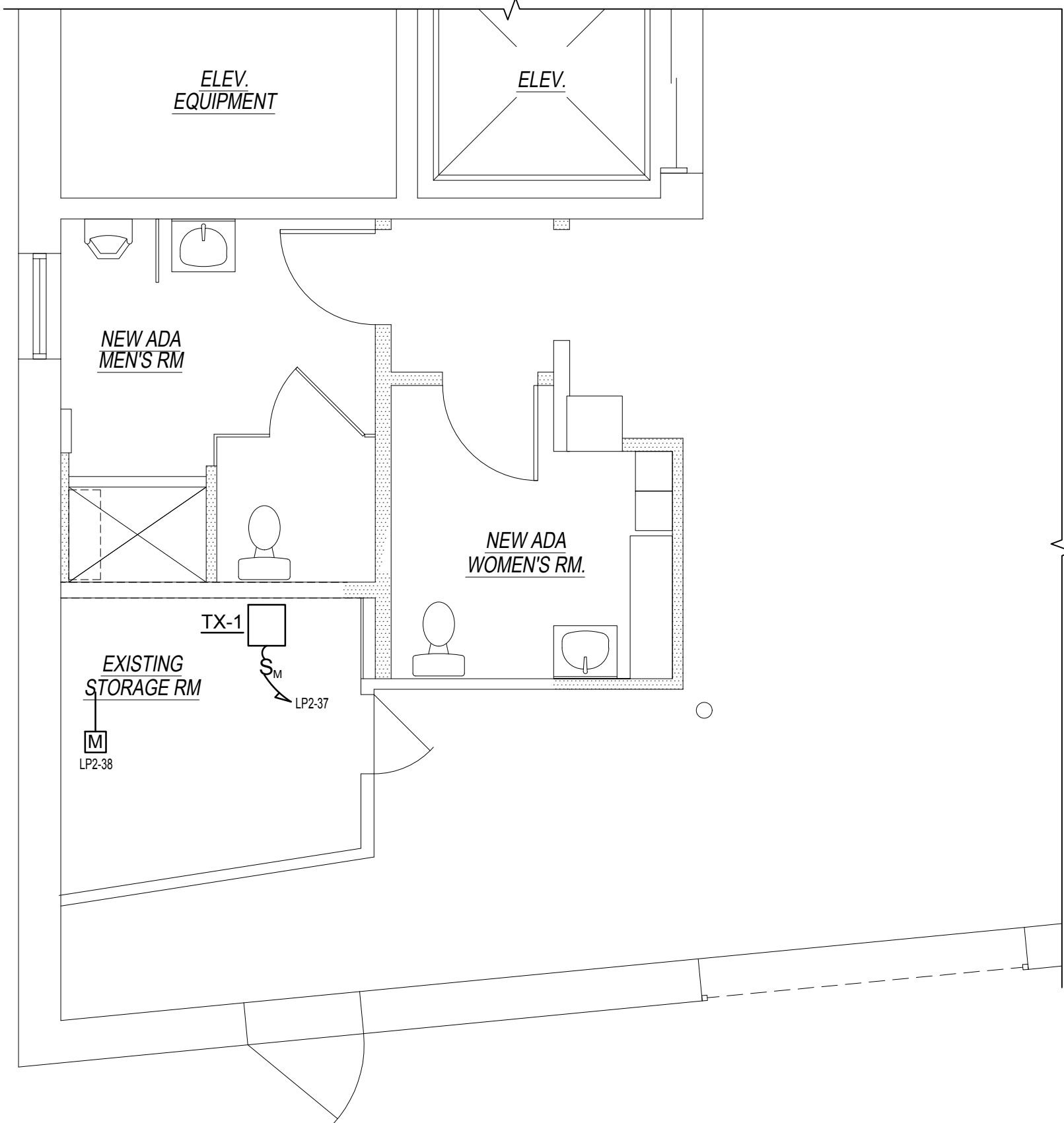
INTERIOR RENOVATION PROJECT
40 PELHAM ROAD
NEW ROCHELLE, NY 10801

DRAWING TITLE

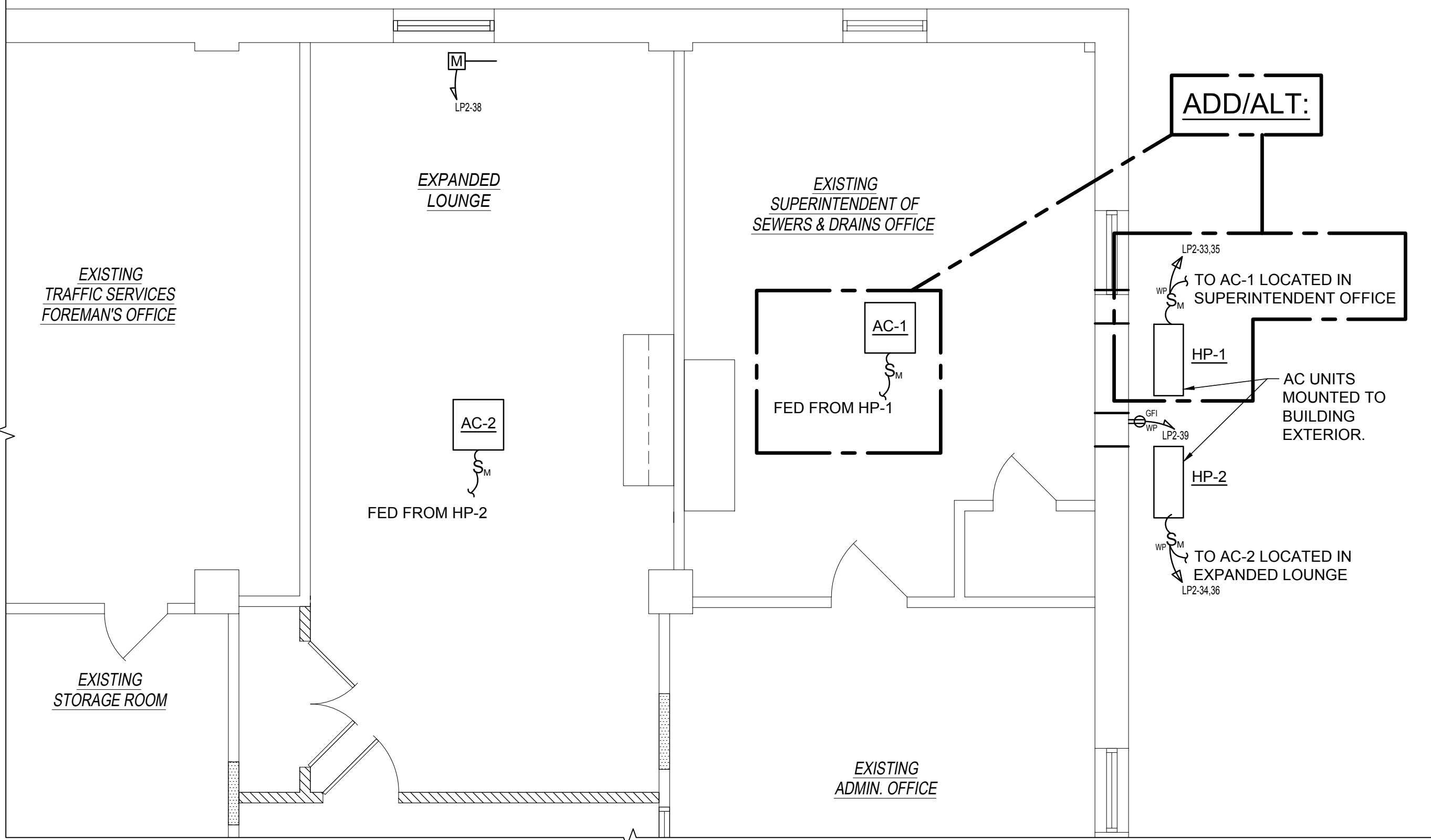
ELECTRICAL SYMBOLS, ABBREVIATIONS, GENERAL NOTES AND DETAILS

SEAL	SCALE AS NOTED	PROJECT NO. NCNR0006.01
	DRAWN BY JJ	DRAWING NO.
	CHECKED BY ML	E-001
	DATE 10/06/23	

CITY OF NEW ROCHELLE
DEPT. OF PUBLIC WORKS
515 NORTH AVENUE
NEW ROCHELLE, NEW YORK



3 ELECTRICAL FIRST LEVEL PART PLAN B
SCALE: 1/4" = 1'-0"



2 ELECTRICAL FIRST LEVEL PART PLAN A
SCALE: 1/4" = 1'-0"

ADD/ALT:

EX. LP2 PANEL SCHEDULE							
MAIN RATING: 225A		MAIN C.B.: MLO					
VOLTAGE: 208Y/120V		PHASE: 3		WIRE: 4		MOUNTING: SURFACE	
CIRC. NO.	LOAD DESCRIPTION	BKR. AMPS	NO. OF POLES	NO. OF POLES	BKR. AMPS	LOAD DESCRIPTION	CIRC. NO.
1	EX. LOAD	20	1	1	20	EX. LOAD	2
3	EX. LOAD	20	1	1	20	EX. LOAD	4
5	EX. LOAD	20	1	1	20	EX. LOAD	6
7	EX. LOAD	20	1	1	20	EX. LOAD	8
9	EX. LOAD	20	1	1	20	EX. LOAD	10
11	EX. LOAD	20	1	1	20	EX. LOAD	12
13	EX. LOAD	20	1	1	20	EX. LOAD	14
15	EX. LOAD	20	1	1	20	EX. LOAD	16
17	EX. LOAD	20	1	1	20	EX. LOAD	18
19	EX. LOAD	20	1	1	20	EX. LOAD	20
21	EX. LOAD	20	1	1	20	EX. LOAD	22
23	EX. LOAD	30	2	2	30	EX. LOAD	24
25							26
27							28
29	EX. LOAD	15	3	3	50	EX. LOAD	30
31							32
33	HP-1	15*	2	2	15*	HP-2	34
35							36
37	TX-1	20*	1	1	20*	MOTORIZED DAMPERS	38
39	REC - EXTERIOR GFI	20*	1	-	-	BLANK	40
41	BLANK	-	-	-	-	BLANK	42

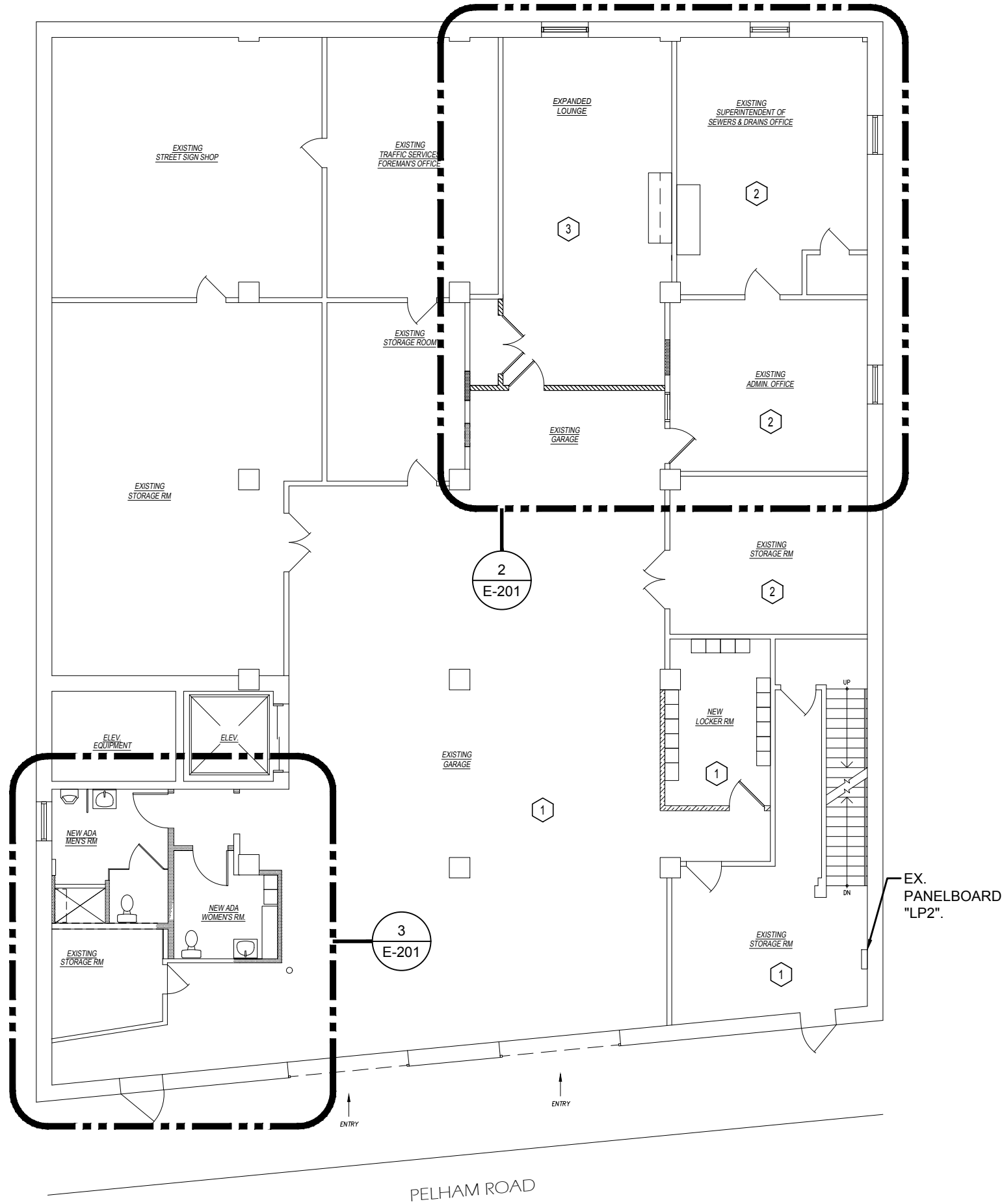
LK - PROVIDE LOCKING TABS ON C.B.; GF - GFI TYPE C.B.; GP - GFP TYPE C.B.; AF - ARC FAULT TYPE C.B.; ST - SHUNT TRIP C.B.

NOTES:
1. EXISTING PANELBOARD TYPE: SQUARE D NQOB.
2. * INDICATES CIRCUIT BREAKERS TO BE PROVIDED AS PART OF PROJECT.

ADD/ALTERNATE:
1. ALL WORK ASSOCIATED WITH AC-1 AND HP-1 SHALL BE PRICED SEPARATELY, INCLUDING ALL ASSOCIATED WIRING, CIRCUIT BREAKERS, DISCONNECT SWITCHES, EXTERIOR WALL PENETRATIONS, AND ALL REQUIRED MOUNTING HARDWARE AND SUPPORTS.

CEILING TYPE LEGEND:

- 1 OPEN CEILING
- 2 GYP CEILING
- 3 DROP CEILING



1 ELECTRICAL FIRST LEVEL KEY PLAN
SCALE: 3/32" = 1'-0"

1	ISSUED FOR BID	10/06/23
No.	ISSUE OR REVISION	DATE

No use, reproduction or dissemination may be made of this drawing and the concepts set forth without the prior written consent of OLA Consulting Engineers, P.C. Copyright © 2023

PROJECT TITLE
INTERIOR RENOVATION PROJECT
40 PELHAM ROAD
NEW ROCHELLE, NY 10801

DRAWING TITLE
ELECTRICAL
FIRST LEVEL PART PLANS

SEAL	SCALE	PROJECT NO.
	AS NOTED	NCNR0006.01
	DRAWN BY JJ	DRAWING NO.
	CHECKED BY ML	E-201
	DATE 10/06/23	