City of Auburn, Maine

"Maine's City of Opportunity"

Financial Services

October 28, 2016

Dear Bidder:

The City of Auburn is accepting written proposals for a **General Contractor** for the **Hasty Community Center Renovations Project,** located at 48 Pettingill Park Road, Auburn, ME. The City reserves the right to accept or reject any or all proposals in whole or in part and to waive any informality the City may determine necessary. The City also reserves to itself the exclusive right to accept any proposals when it is deemed by the City to be in its best interest. The City of Auburn is governed by Title 1 M.R.S.A. § 401-410, otherwise known as the Freedom of Information Act, which considers bid specifications as public documents. In awarding any proposal, the City may consider, but not be limited to, any of the following factors: Bidder qualifications, price, experience, financial standing with the City, warranties, references, bonding, delivery date, and service of Bidder. Vendors/Contractors shall be current on all amounts due to the City of Auburn prior to the City entering into any contract agreement. All proposals must include FOB to Auburn, Maine unless otherwise specified.

A **mandatory** pre-bid meeting to review the work site is scheduled for **Wednesday, November 9, 2016 at 9:00 a.m.** at the Hasty Community Center, 48 Pettingill Park Road, Auburn, ME. Please contact Derek Boulanger at dboulanger@auburnmaine.gov to confirm participation. Proposals will not receive consideration unless submitted in accordance with the following instructions to bidders. Please mark sealed envelopes plainly:
"Hasty Community Center Renovations – Bid #2017-008."

Questions regarding this Request for Proposals should be directed to Derek Boulanger, Facilities Manager/Purchasing Agent, at (207) 333-6601, ext. 1135.

Please submit your proposal to the City of Auburn by **2:00 p.m. Thursday, December 1, 2016.** Proposals will be opened at 2:00 p.m. Proposals must be delivered to **Derek Boulanger, Facilities Manager/Purchasing Agent, 60 Court Street, Auburn, ME 04210** on or before the date and time appointed. No proposals will be accepted after the time and date listed above.

Sincerely,

Derek Boulanger
Facilities Manager/
Purchasing Agent

60 Court Street • Auburn, ME 04210
(207) 333-6600 Voice • (207) 333-6601 Automated • (207) 333-6620 Fax
www.auburnmaine.gov

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CONDITIONS AND INSTRUCTIONS TO BIDDERS

1. Bidders shall use the enclosed bid form for quotations. Whenever, in bid forms, an article is defined by using a trade name or catalog number, the term "or approved equal", if not inserted, shall be implied.

2. Submit a separate unit price for each item unless otherwise specified in the bid request. Award will be made on a basis of each item, or as a group, whichever is in the best interest of the City. Prices stated are to be "delivered to destination".

3. Bid proposals must be completed in full, in ink, and must be signed by firm official. Bid proposal **must be notarized** prior to bid being sealed and will be disqualified if not notarized. Bids may be withdrawn prior to the time set for the official opening.

4. Bids will be opened publicly. Bidders or representatives may be present at bid opening.

5. Awards will be made to the lowest responsible bidder, considering the quality of the materials, date of delivery, cost which meets specification and is in the best interest to the City of Auburn.

6. All transportation charges, including expense for freight, transfer express, mail, etc. shall be prepaid and be at the expense of the vendor unless otherwise specified in the bid.

7. The terms and cash discounts shall be specified. Time, in connection with discount offered, will be computed from date of delivery at destination after final inspection and acceptance or from date of correct invoice, whichever is later.

8. The City is exempt from payment of Federal Excise Taxes on the articles not for resale, Federal Transportation Tax on all shipments and Maine Sales Tax and Use Taxes. Please quote less these taxes. Upon application, exemption certificate will be furnished with the Purchase Order when required.

9. Time of delivery shall be stated. If time is of the essence, the earliest date may be a factor in the bid award.

10. No contract may be assigned without the written consent of the Finance Director or her designate. The contract shall not be considered valid until a purchase order has been issued to the successful bidder.

11. Please state **"Hasty Community Center Renovations – Bid #2017-008."** on submitted sealed envelope.

12. The City of Auburn reserves the right to waive any formality and technicality in bids whichever is deemed best for the interest of the City of Auburn.

13. All work shall be completed within 110 calendar days from the date of contract signing. Liquidated damages of $750/calendar day will be assessed on uncompleted work.

GENERAL CONDITIONS

1. Equal Employment Opportunity

The City of Auburn is an Equal Opportunity Employer and shall not discriminate against an applicant for employment, and employee or a citizen because of race, color, sex, marital status, physical and/or mental handicap, religion, age, ancestry or natural origin, unless based upon a bona-fide occupation qualification. Vendors and contractor or their agents doing business with the City shall not violate the above clause or the Civil Rights Acts of 1964. Violations by vendors shall be reviewed on a case-by-case basis and may mean an automatic breach of contract or service to the City of Auburn.

2. Save Harmless

The Bidder agrees to protect and save harmless the owner from all costs, expenses or damages that may arise out of alleged infringement of patents of materials used.

3. Subcontracting

The Bidder shall not subcontract any part of the work or materials or assign any monies due it without first obtaining the written consent of the municipality. Neither party shall assign or transfer its interest in the contract without the written consent of the other party.

4. Warranty

The Bidder warrants that all work will be of good quality and free from faults and defects, and in conformance with the specifications. All work not so conforming to these standards may be considered defective. The Bidder agrees to be responsible for the acts and omissions of all of its employees and all subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Bidder.

5. Bonds, Retainage, and Payments

A bid bond shall be submitted with appropriate bid forms in the amount of 5% of the total contract value. Also, payment and performance bonds will be required from the contractor who is awarded this contract. Retainage in the amount of 10% will be held from each progress payment and shall be released at the discretion of the Project Engineer. Payments shall be made by the City to the Contractor 30 days after receipt of the request for payment.

BID PROPOSAL FORM

Due: Thursday, December 1, 2016

To: City of Auburn
Derek Boulanger,
Facilities Manager/Purchasing Agent
60 Court Street
Auburn, ME 04210

The undersigned individual/firm/business guarantees this price for Thirty days (60) from the bid due date. The undersigned submits this proposal without collusion with any other person, individual, firm, or agency. The undersigned ensures the authority to act on behalf of the corporation, partnership, or individual they represent; and has read and agreed to all of the terms, requests, or conditions written herein by the City of Auburn. By signing this bid form, the firm listed below hereby affirms that its bid meets the minimum specifications and standards as listed above and as amended in Addendums #_____ Dated_____.

Signature _____ Name (print)_____

Title_____ Company_____

Address_____

Telephone No._____ Fax No. _____

Email Address:_____

STATE OF MAINE
_____, SS. Date: _____

Personally appeared _____ and acknowledged the foregoing instrument to be his/her free act and deed in his/her capacity and the free act and deed of said company.

_____
Notary Public

_____
Print Name
Commission Expires_____

SCHEDULE OF VALUES

PROJECT NAME: **"Hasty Community Center Renovations – Bid #2017-008."**

CONTRACTOR SCHEDULE OF VALUES

Item	Description	Value
1.	General Conditions	$_____ . ____
2.	Bonds	$_____ . ____
3.	Insurance	$_____ . ____
4.	Demolition	$_____ . ____
5.	Cast-In-Place Concrete	$_____ . ____
6.	Masonry Mortaring and Grouting	$_____ . ____
7.	Reinforced Unit Masonry	$_____ . ____
8.	Cold Formed Metal Framing	$_____ . ____
9.	Metal Fabrications	$_____ . ____
10.	Rough Carpentry	$_____ . ____
11.	Finish Carpentry	$_____ . ____
12.	Thermal Insulation	$_____ . ____
13.	Joint Sealers	$_____ . ____
14.	Hollow Metal Doors and Frames	$_____ . ____
15.	Roll-Up Door	$_____ . ____
16.	Automatic Entrances	$_____ . ____
17.	Aluminum-Framed Storefronts	$_____ . ____
18.	Door Hardware	$_____ . ____
19.	Glazing	$_____ . ____
20.	Gypsum Board Assemblies	$_____ . ____
21.	Acoustical Ceilings	$_____ . ____
22.	Resilient Flooring	$_____ . ____
23.	Rubber Floor Tile	$_____ . ____
24.	Painting and Coating	$_____ . ____
25.	Signage	$_____ . ____

26.	Metal Toilet Compartments	$_____ . ____
27.	Toilet and Bath Accessories	$_____ . ____
28.	Hangers and Supports for Plumbing Piping and Equipment	$_____ . ____
29.	Plumbing Insulation	$_____ . ____
30.	Domestic Water Piping	$_____ . ____
31.	Domestic Water Piping Specialties	$_____ . ____
32.	Sanitary Waste and Vent Piping	$_____ . ____
33.	Plumbing Fixtures	$_____ . ____
34.	HVAC Insulation	$_____ . ____
35.	Metal Ducts	$_____ . ____
36.	Air Duct Accessories	$_____ . ____
37.	HVAC Power Ventilators	$_____ . ____
38.	Diffusers, Registers and Grilles	$_____ . ____
39.	Electrical Power	$_____ . ____
40.	Electrical Lighting	$_____ . ____
46.	**TOTAL BASE BID (Sum of Items 1 thru 40)**	**$_____ . ____**

TOTAL OF ALL LINE ITEMS IN SCHEDULE OF VALUES MUST EQUAL TOTAL BASE BID.

THERE MUST BE AMOUNTS IN EACH OF THE SPECIFIED ITEMS ABOVE.

FAILURE TO PROPERLY COMPLETE THIS ATTACHEMENT WILL BE CONSIDERED A NON RESPONISVE PROPOSAL AND WILL BE REJECTED.

BID BOND

KNOW ALL BY THESE PRESENTS, that we, the undersigned, _____as Principal, and _____ as Surety, are hereby held and firmly bound unto _____as OWNER in the penal sum of _____for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____day of _____, 2016.

The Condition of the above obligation is such that whereas the principal has submitted to _____a certain BID,

attached hereto and hereby made a part hereof to enter into a contract in writing, for the _____

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for all and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S)
Principal

Surety

By:_____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

CONTRACTOR PERFORMANCE BOND

Bond No.: ***insert bond number***

We, the undersigned, ***insert company name of Contractor***, ***select type of entity*** of ***insert name of municipality*** in the State of ***insert name of state*** as principal, and ***insert name of surety*** as Surety, are hereby held and firmly bound unto ***select title of obligee*** in the penal sum of the Contract Price $ ***insert the Contract Price in numbers*** for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract, for the construction of ***insert name of project as designated in the contract documents***, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

CONTRACTOR PERFORMANCE BOND

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract.

Contractor

_____

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

_____

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

CONTRACTOR PAYMENT BOND

Bond No.: ***insert bond number***

We, the undersigned, ***insert company name of Contractor***, ***select type of entity*** of ***insert name of municipality*** in the State of ***insert name of state*** as principal, and ***insert name of surety*** as Surety, are hereby held and firmly bound unto ***select title of obligee*** in the penal sum of the Contract Price $ ***insert the Contract Price in numbers*** for the use and benefit of claimants, defined as an entity having a contract with the principal or with a subcontractor of the principal for labor, materials, or both labor and materials, used or reasonably required for use in the performance of the contract, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract, for the construction of ***insert name of project as designated in the contract documents***, and shall fully reimburse the oblige for all outlay and expense with said oblige may incur in making good any default of said principal, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

CONTRACTOR PAYMENT BOND

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this ***insert day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the construction contract.

Contractor

_____

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

_____

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

SAMPLE CONTRACT AGREEMENT

AIA® Document A105™ – 2007

Standard Form of Agreement Between Owner and Contractor for a Residential or Small Commercial Project

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

The Architect:
(Name, legal status, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

State or local law may impose requirements on contracts for home improvements. If this document will be used for Work on the Owner's residence, the Owner should consult local authorities or an attorney to verify requirements applicable to this Agreement.

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TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

§ 1.1 The Contractor shall complete the Work described in the Contract Documents for the Project. The Contract Documents consist of

.1 this Agreement signed by the Owner and Contractor;

.2 the drawings and specifications prepared by the Architect, dated , and enumerated as follows:

Drawings:

Number	Title	Date

Specifications:

Section	Title	Pages

.3 addenda prepared by the Architect as follows:

Number	Date	Pages

.4 written orders for changes in the Work issued after execution of this Agreement; and

.5 other documents, if any, identified as follows:

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The number of calendar days available to the Contractor to substantially complete the Work is the Contract Time. The date of commencement of the Work shall be the date of this Agreement unless otherwise indicated below. The Contractor shall substantially complete the Work, no later than ( ) calendar days from the date of commencement, subject to adjustment as provided in Article 10 and Article 11.
(Insert the date of commencement, if it differs from the date of this Agreement.)

ARTICLE 3 CONTRACT SUM

§ 3.1 Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

($)

§ 3.2 For purposes of payment, the Contract Sum includes the following values related to portions of the Work:
(Itemize the Contract Sum among the major portions of the Work.)

Portion of Work	Value

§ 3.3 Unit prices, if any, are as follows:
(Identify and state the unit price; state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 3.4 Allowances included in the Contract Sum, if any, are as follows:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price

§ 3.5 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 3.6 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work.

ARTICLE 4 PAYMENT

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12, as follows:
(Insert below timing for payments and provisions for withholding retainage, if any.)

§ 4.2 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate below, or in the absence thereof, at the legal rate prevailing at the place of the Project.

%

ARTICLE 5 INSURANCE

§ 5.1 The Contractor shall provide Contractor's general liability and other insurance as follows:
(Insert specific insurance requirements and limits.)

Type of insurance	Limit of liability ($0.00)

§ 5.2 The Owner shall provide property insurance to cover the value of the Owner's property, including any Work provided under this Agreement. The Contractor is entitled to receive an increase in the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance.

§ 5.3 The Contractor shall obtain an endorsement to its general liability insurance policy to cover the Contractor's obligations under Section 8.12.

§ 5.4 Each party shall provide certificates of insurance showing their respective coverages prior to commencement of the Work.

§ 5.5 Unless specifically precluded by the Owner's property insurance policy, the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, suppliers, agents and employees, each of the other; and (2) the Architect, Architect's consultants and any of their agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance or other insurance applicable to the Work.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 THE CONTRACT

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 THE WORK

The term "Work" means the construction and services required by the Contract Documents, and includes all other labor, materials, equipment and services provided, or to be provided, by the Contractor to fulfill the Contractor's obligations.

§ 6.3 INTENT

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

§ 6.4 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

Documents prepared by the Architect are instruments of the Architect's service for use solely with respect to this Project. The Architect shall retain all common law, statutory and other reserved rights, including the copyright. The Contractor, subcontractors, sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the instruments of service solely and exclusively for execution of the Work. The instruments of service may not be used for other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Architect.

ARTICLE 7 OWNER

§ 7.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all necessary surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, the Owner shall obtain and pay for other necessary approvals, easements, assessments and charges.

§ 7.2 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work which is not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

§ 7.3 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies. In such case, the Contract Sum shall be adjusted to deduct the cost of correction from payments due the Contractor.

§ 7.4 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

§ 7.4.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefor.

ARTICLE 8 CONTRACTOR

§ 8.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 8.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies or omissions discovered to the Architect.

§ 8.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work.

§ 8.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 8.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner or Architect have made a timely and reasonable objection.

§ 8.4 LABOR AND MATERIALS

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

§ 8.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

§ 8.5 WARRANTY
The Contractor warrants to the Owner and Architect that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents.

§ 8.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes that are legally required when the Contract is executed.

§ 8.7 PERMITS, FEES AND NOTICES
§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work.

§ 8.7.2 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the Architect in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules and regulations.

§ 8.8 SUBMITTALS
The Contractor shall promptly review, approve in writing and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents.

§ 8.9 USE OF SITE
The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents and the Owner.

§ 8.10 CUTTING AND PATCHING
The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 8.11 CLEANING UP
The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery and surplus material; and shall properly dispose of waste materials.

§ 8.12 INDEMNIFICATION
To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder.

ARTICLE 9 ARCHITECT
§ 9.1 The Architect will provide administration of the Contract as described in the Contract Documents. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The Architect will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work,

since these are solely the Contractor's responsibility. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor.

§ 9.5 The Architect has authority to reject Work that does not conform to the Contract Documents.

§ 9.6 The Architect will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.7 The Architect will promptly interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request from either the Owner or Contractor.

§ 9.8 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 9.9 The Architect's duties, responsibilities and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly in writing. If the Owner and Contractor can not agree to a change in the Contract Sum, the Owner shall pay the Contractor its actual cost plus reasonable overhead and profit.

§ 10.2 The Architect will have authority to order minor changes in the Work not involving changes in the Contract Sum or the Contract Time and not inconsistent with the intent of the Contract Documents. Such orders shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall carry out such orders promptly.

§ 10.3 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to equitable adjustment.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 CONTRACT SUM

The Contract Sum stated in the Agreement, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 12.2 APPLICATIONS FOR PAYMENT

§ 12.2.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for Work completed in accordance with the values stated in the Agreement. Such Application shall be supported by data substantiating the Contractor's right to payment as the Owner or Architect may reasonably require. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment

may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing.

§ 12.2.2 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or other encumbrances adverse to the Owner's interests.

§ 12.3 CERTIFICATES FOR PAYMENT

The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part.

§ 12.4 PROGRESS PAYMENTS

§ 12.4.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Contract Documents.

§ 12.4.2 The Contractor shall promptly pay each subcontractor and supplier, upon receipt of payment from the Owner, an amount determined in accordance with the terms of the applicable subcontracts and purchase orders.

§ 12.4.3 Neither the Owner nor the Architect shall have responsibility for payments to a subcontractor or supplier.

§ 12.4.4 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the requirements of the Contract Documents.

§ 12.5 SUBSTANTIAL COMPLETION

§ 12.5.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

§ 12.5.2 When the Work or designated portion thereof is substantially complete, the Architect will make an inspection to determine whether the Work is substantially complete. When the Architect determines that the Work is substantially complete the Architect shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish the responsibilities of the Owner and Contractor, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 12.6 FINAL COMPLETION AND FINAL PAYMENT

§ 12.6.1 Upon receipt of a final Application for Payment, the Architect will inspect the Work. When the Architect finds the Work acceptable and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment.

§ 12.6.2 Final payment shall not become due until the Contractor submits to the Architect releases and waivers of liens, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests or encumbrances arising out of the Contract.

§ 12.6.3 Acceptance of final payment by the Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 13 PROTECTION OF PERSONS AND PROPERTY

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury or loss to employees on the Work, the Work and materials and

equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, or by anyone for whose acts the Contractor may be liable.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of one year after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 ASSIGNMENT OF CONTRACT

Neither party to the Contract shall assign the Contract as a whole without written consent of the other.

§ 15.2 TESTS AND INSPECTIONS

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the Architect requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections or approvals that do not become requirements until after the Contract is executed.

§ 15.3 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 TERMINATION BY THE CONTRACTOR

If the Architect fails to certify payment as provided in Section 12.3 for a period of 30 days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 12.4.1 for a period of 30 days, the Contractor may, upon seven additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, and costs incurred by reason of such termination.

§ 16.2 TERMINATION BY THE OWNER FOR CAUSE

§ 16.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the subcontractors;
- **.3** persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or
- **.4** is otherwise guilty of substantial breach of a provision of the Contract Documents.

§ 16.2.2 When any of the above reasons exist, the Owner, after consultation with the Architect, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may

- **.1** take possession of the site and of all materials thereon owned by the Contractor, and
- **.2** finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

§ 16.3 TERMINATION BY THE OWNER FOR CONVENIENCE

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 17 OTHER TERMS AND CONDITIONS

(Insert any other terms or conditions below.)

This Agreement entered into as of the day and year first written above.
(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name, title and address)	*(Printed name, title and address)* LICENSE NO.: JURISDICTION:

Additions and Deletions Report for

AIA® Document A105™ – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 09:45:19 on 08/30/2010.

There are no differences.

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, Blaine M. Buck, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 09:45:19 on 08/30/2010 under Order No. 9569708616_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A105™ – 2007, Standard Form of Agreement Between Owner and Contractor for a Residential or Small Commercial Project, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

CITY OF AUBURN, MAINE

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Bid Documents

October 28, 2016

APPENDIX A

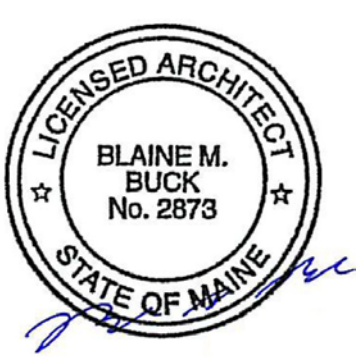
CONSTRUCTION SPECIFICATIONS

CITY OF AUBURN, MAINE

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008



100% Bid Specifications

October 28, 2016

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DIVISION 26 – ELECTRICAL

DRAWINGS

END OF SECTION 00 01 00

SECTION 00 01 02
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: Hasty Community Center Renovations, located at 48 Pettingill Park Road, Auburn, Maine.

B. The Owner, hereinafter referred to as Owner: The City of Auburn, Maine.

C. Owner's Representative: Cordjia Capital Projects Group
   1. Contact: Mitch Daigle
   2. Address: 16 Tannery Lane, Suite 23; PO Box 1367
   3. City, State, Zip: Camden, Maine 04843
   4. Phone / Fax: (207) 236-9970 / (207) 236-9971
   5. E-mail: mdaigle@cordjiacpg.com

1.02 PROJECT DESCRIPTION

A. The project consists of selective demolition, asbestos abatement, accessibility improvements, renovations and finish upgrades, painting, lighting & electrical upgrades, exhaust fan upgrades, and plumbing upgrades for the Hasty Community Center building. The building included in this specification is owned and operated by The City of Auburn, Maine located at City Hall, 60 Court Street in Auburn, Maine.

B. Contract Terms: A105-2007, Standard Form of Agreement Between Owner and Contractor for a Residential or Small Commercial Project.

C. A Bid Bond in the amount of 5% of the bid amount is required.

D. The selected contractor will be required to furnish 100% Performance and Payment Bonds.

C. Phasing of the Work: The selected Contractor may be required to participate with the Owner and the Owners Representative to phase the scope of work based on available funding.

D. The premises at the project site are open for examination by bidders with advance notice and approval from the Owner during the following hours:
   1. Monday through Friday: 8:00 a.m. to 3:00 p.m.

1.03 PROJECT CONSULTANTS

A. Owner's A&E Consultant & Owners Representative: Cordjia Capital Projects Group
   1. Address: 16 Tannery Lane, Suite 23; PO Box 1367
   2. City, State, Zip: Camden, Maine 04843
   3. Phone / Fax: (207) 236-9970 / (207)236-9971
   4. E-mail: mdaigle@cordjiacpg.com

1.04 PROCUREMENT TIMETABLE

A. Mandatory Pre-Bid Meeting: 9:00 AM on November 9, 2016 at the Hasty Community Center.

B. Last Request for Information Due: November 28, 2016 prior to 2:00 PM.

C. Bid Due Date: December 1, 2016, before 2:00 p.m. local time.

D. Contract Negotiations: Within 15 working days after due date.

E. Notice of Award: Within 20 working days after due date.

F. Proposals May Not Be Withdrawn Until: 60 calendar days after bid due date.

G. Substantial Completion Date: Contractor to provide best price schedule but not later than 110 calendar days from date of commencement or March 31, 2017.

H. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.05 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:
   1. From the Owner's Representative for a non-refundable fee of:
      a. $80 for one complete set of specifications and full scale drawings.
      b. Electronic PDF file emailed at no charge.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 00 01 02

SECTION 01 00 00

ADMINISTRATIVE PROVISIONS

PART 1 GENERAL

1.01 CONTRACT REQUIREMENTS

A. Scope of Work

1. The Work of the Contract includes selective demolition, asbestos abatement, accessibility improvements, renovations and finish upgrades, painting, lighting & electrical upgrades, exhaust fan upgrades, and plumbing upgrades for the Hasty Community Center building in accordance with the Contract Documents.

B. Contract Method

1. Basis of award of this Contract will be in accordance with the Conditions and Instructions to Bidders section within the RFP.

2. Contract type: A105-2007, Standard Form of Agreement Between Owner and Contractor for a Residential or Small Commercial Project. A Sample Agreement is located within the RFP.

3. The project will be constructed under a single lump sum contract.

C. Work Sequence

1. Work of the Contract and related provisions are as described in the Contract Documents.

D. Contractor Use of Premises

1. Work of this Contract includes coordinating the work with the daily operations of the Owner.

2. Limit use of premises for Work and construction operations only, allow for Owner occupancy, work by other Contractors, and public access.

4. Limit access to Owner's site, hours of operations are 7:00 A.M. - 6:00 P.M. If Contractor would like to work on weekends or federal and state holiday’s he/she must request permission from Owner three working days in advance. The Owner reserves the right to accept or reject the Contractor’s request.

6. Coordinate use of premises under direction of Owner.

7. The Contractor shall be responsible for his/her security in Construction Area until substantial completion. The contractor shall coordinate security of Building with Owner.

E. Owner Occupancy:

1. Owner will occupy the facility during entire period of construction, to conduct Owner's normal operations. The Contractor shall cooperate with Owner to minimize conflict to the Owner's operations.

F. Owner-furnished Products:

1. Toilet Paper Dispensers, Soap Dispensers and Paper Towel Dispensers; Contractor shall be responsible to notify Owner when Owner-furnished products are ready for installation by the Contractor.

G. Schedule of Allowances: Not Used

H. Additive Alternate: Not Used

I. Unit Prices: Not Used

J. Applications for Payment:

1. Submit Two (2) copies of each application using a form that is acceptable to the Owner and the Architect/Engineer, hereafter referred to solely as Owner.

K. Coordination:

1. Work of this Contract includes coordination of the entire Work of the Project.

2. The Contractor shall obtain and pay for all necessary construction/building permits. The Contractor shall send two (2) copies of all permits to the Owner and post at the project site in accordance with the issuing authority.

3. Coordinate work with all utilities. Interruption of services shall be coordinated with an appropriate official at the facility to minimize the disruption of operations within the facility.

4. Notify an appropriate official at the facility at least three days in advance of the need to move furnishings, equipment, materials, etc. from areas to be affected by the construction.

5. Control on-site activities to minimize the disruption of the occupants.

6. Coordinate the work of equipment and material suppliers and subcontractors.

7. Make arrangements for the timely delivery of materials and supplies to the job site and for their temporary storage on site.

8. Maintain the project site in a neat condition.

9. Assist the Owner during periodic site visits and in the review of construction.

10. Maintain up to date progress records and as-built drawings.

L. Conflicts

1. Contractor shall notify Owner in writing of any real or apparent conflicts in the Contract Documents and, except in cases of emergency, await Owner's determination before proceeding.

2. The Owner's Project Manager shall resolve conflicts that arise during construction.

3. If two or more solutions are indicated in the Contract Documents, the Contractor shall assume the cost of the more expensive solution unless otherwise directed by the Owner.

M. Field Engineering

1. The Contractor shall be responsible for all field engineering as required.

2. The Contractor shall be responsible for obtaining any permits necessary.

N. Reference Standards

1. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

2. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is given.

3. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

1.02 SCHEDULING AND PHASING OF WORK

A. Substantial Completion: Work of the Contract must be Substantially Completed by ***March 31, 2017*** so that the Owner can have full use of the facility. Final completion of all Work of this Contract shall be by ***April 22, 2017***.

1. Except as otherwise specified, Substantial Completion is hereby defined to mean a stage of completion sufficient for the Owner to have full beneficial use and occupancy of the structure involved, less only minor corrections and repairs that can be performed without undue annoyance to building occupants which shall be documented on the "punch list" as specified hereinafter. Beneficial use and occupancy means removal of all debris, interior and exterior scaffolding, surplus equipment and material and cleaning as required under the Contract completed.

2. Normal building operations will continue throughout the length of the Project. The successful Contractor shall develop a schedule of work that is respectful of the Owner's needs but with a mutual understanding that temporary relocation of personnel within the facility may be required.

3. Within ten (10) working days following receipt of the fully executed formal Contract Agreement by the Contractor, the Contractor shall prepare a proposed Phasing and Progress Schedule. The final Schedule shall be as mutually agreed to by the Owner and Contractor, and within the following guidelines:

    a. The Owner's business operations must continue throughout the entire construction period.

    b. Work within the building interior must comply with the Owner's requirements for continued use and occupancy.

    c. Applicable egress codes must be complied with during the construction period. In particular, building entrances and exit ways must be kept open at all times.

1.03 REGULATORY REQUIREMENTS

A. Conform to Local, State and Federal codes.

1.04 PROJECT MEETINGS

A. Requirements:

1. Contractor shall, upon acceptance of a Contract and before commencing Work, contact the Owner and request a pre-construction conference.

B. Pre-construction Conference:

1. The Owner will administer a pre-construction conference for execution of Owner-Contractor Agreement and exchange of information and preliminary submittals.

C. Construction Progress Meetings:

1. The Contractor shall schedule and administer Project meetings throughout progress of the Work, called meetings, and pre-installation conferences.

2. The Contractor shall make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to Owner, participants, and those affected by decisions made at meetings.

3. Attendance: Job superintendent, major Subcontractors and suppliers, Owner and those appropriate to agenda topics for each meeting.

4. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

1.05 SUBMITTALS

A. Procedures:

1. In all submittals always refer to the project name and bid number.

2. Submit the number of copies which Contractor requires, plus two copies, which will be retained by Owner.

3. Submittals can be delivered electronically to both the Architect/Engineer and Owner. If submitting by e-mail, submit to the Architect/Engineer for approval, and the Owner for review, at the e-mail address below:

   Architect/Engineer: mdaigle@cordjiacpg.com

   Owner: dboulanger@auburnmaine.gov

4. Submittals can be delivered in paper form. Deliver copies of submittals to Architect/Engineer for approval at the address below:

   Mitch Daigle
   16 Tannery Lane, Suite 23
   PO Box 1367
   Camden, ME 04843

   And one (1) copy to the Owner for review:

   Derek Boulanger
   Facilities Manager / Purchasing Agent
   City of Auburn
   60 Court St.
   Auburn, Me 04210

5. Submittal Sheets:
   a. Transmit each item, as specified, using a form that is acceptable to the Owner;
   b. Identify Project, Bid No., Contractor, Subcontractor, major supplier;
   c. Identify drawing sheet and detail number, and Specification Section number, as appropriate;
   d. Identify deviations from Contract Documents.

6. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

7. Architect/Engineer shall have 14 calendar days for review of submittals.

8. After the Architect/Engineer's review of submittal, revise and resubmit as required identifying changes made since previous submittal.

9. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

B. Construction Progress Schedule:

1. Submit an Initial Construction Progress Schedule in duplicate, see 1.02.A.3 this section for submission information. After review by Owner revise and resubmit as required.
2. The Contractor shall submit a Final Construction Progress Schedule within 4 calendar days of Owner review.
3. Show submittal dates required for Shop Drawings, Product Data, and Samples, and product delivery dates, including those furnished by Owner and those under Allowances as applicable.
4. Submit revised construction schedules with each Application for Payment, reflecting changes since previous submittal.

C. Schedule Of Values:

1. Submit Contract Schedule Of Values within 10 days after date of Owner - Contractor Agreement.
2. Submit Contract Schedule Of Values on a form that is acceptable to the Owner, such as the AIA G703 form.
3 Format: Table of Contents of this Project Manual.
4. Include in each line item a directly proportional amount of Contractor's overhead and profit.
5. Revise schedule of values to list change orders, for each application for payment.

D. Shop Drawings:

1. Shop drawings will be submitted to Owner, in accordance with para. 1.05 of this Section.

E. Product Data:

1. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work.
2. Submit the number of copies required in 1.05.A.2, this Section.

F. Manufacturer’s Instructions:

1. Submit the number of copies required in 1.05.A.2, this Section, of Manufacturer's Instructions.

G. Informational Submittals:

1. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
    a. Name, address, and telephone number of entity performing subcontract or supplying products.

b. Number and title of related Specification Section(s) covered by subcontract.

c. Drawing number and detail references, as appropriate, covered by subcontract.

2. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

a. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.06 QUALITY CONTROL

A. Quality Control, General

1. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Workmanship

1. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

2. Perform work by persons qualified to produce workmanship of specified quality.

3. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking and as otherwise indicated by the manufacturer.

C. Manufacturers' Instructions

1. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Owner before proceeding.

D. Manufacturers' Certificates

1. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, those products that meet or exceed specified requirements.

1.07 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Electricity

1. The Contractor shall be allowed to hook to existing electrical panel in building, for temporary power. The Contractor will not disrupt power at building. The Owner will only pay for cost of electricity and reserves the right to deny should the use become excessive.

2. The Contractor shall provide all temporary electrical panels.

3. The Contractor shall be responsible to fix any damages, caused by modifications for temporary services.

B. Lighting

1. The Contractor shall provide source of temporary lighting.

C. Heat, Ventilation

1. The Contractor shall provide source of heating as required that is beyond the heating and ventilation supplied by the Owner under normal operating conditions. The Contractor shall not use electrical heating units, if the Owner is supplying electrical power to the Contractor.

D. Water

1. The Contractor shall be allowed to hook to existing water in building, for temporary water supply. The Contractor will pay for cost of water usage for dust control and compaction [large amounts of water].

E. Sanitary Facilities

1. The Contractor shall provide their own Sanitary Facilities.

F. Barriers

1. Provide as required to prevent public entry to construction areas, to provide for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.

G. The Contractor will provide as necessary:

1. Office Trailer: Weather tight, with lighting, electrical receptacles, heating, cooling and drawing display table. The office trailer will have separate office space for the project manager to conduct his/her daily business.

2. Storage Sheds for Tools, Materials, and Equipment: Weather tight, with adequate space for organized storage and access, and lighting for inspection of stored materials.

3. His/her own on-site telephone, if so required for the conduct of his/her business.

4. Protected storage, if necessary.

5. Temporary barricades to separate the Contract Site areas from the Owner's area or public area.

H. Protection and Restoration

1. The Contractor shall be responsible for all damages to furnishings, equipment, supplies, existing construction, including finished surfaces, caused by Work of Contract.

2. The Contractor shall be fully responsible for maintaining weather-tight integrity of the roofing system and wall systems, including permanent and temporary flashings, during the entire construction period.

3. The Contractor's responsibilities shall include the cost to repair damage to the existing building's structure, finishes and contents associated with the Contractor's failure to maintain the watertight integrity of the roofing system and wall system, whether permanent or temporary, at no additional cost to the Owner.

4. The Contractor shall protect paved areas and lawns around the Building from damage associated with the construction. Costs to repair damage to paved areas and lawns will be deducted from Contractor's final payment to cover Owner's expenses to repair damage should the Contractor fail to repair the damages to the Owners satisfaction. The Owner will determine if damages are minor or major.

I. Security

1. Provide security program and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.

J. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

K. Cleaning during Construction

1. Throughout the construction period the Contractor shall be responsible for maintaining building and site areas affected by the Work in a standard of cleanliness.

    a. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing protection of materials.

    b. Completely remove all scrap, debris, waste material and other items not required for construction from the site at least once a week.

    c. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

2. Conduct daily inspection, more often if necessary, to verify that requirements for cleanliness are being satisfied.

3. Provide required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

4. Use only those cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

L. Removal

1. Unless otherwise specified, materials to be removed, including all components and accessories, become property of the Contractor and shall be promptly removed from the Contract Site and legally disposed of at Contractor's expense.

2. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

3. Clean and repair damage caused by installation or use of temporary facilities. Restore existing facilities used during construction to specified, or to original, condition.

4. The Contractor shall be responsible for removing and disposing of solid wastes (including construction/demolition debris) per Section 01 35 43.

1.08 MATERIAL AND EQUIPMENT

A. Products

1. Products include material, equipment, and systems.
2. Comply with Specifications and referenced standards as minimum requirements.
3. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
4. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by the Contract Documents.
5. ACBM (ASBESTOS CONTAINING BUILDING MATERIALS) ARE NOT ALLOWED, materials containing asbestos in any manner or quantity are not allowed on this Project. If such materials are installed they shall be removed and replaced at no additional cost to the Owner.

B. Transportation and Handling

1. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
2. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
3. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Storage and Protection

1. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

2. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
3. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
4. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

D. Products List

1. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

E. Substitutions

1. Substitutions shall be submitted to Architect/Engineer a minimum of 7 days prior to bid date for review. Any substitutions not submitted 7 days prior to bid date shall not be reviewed or considered.

2. Do not assume that "or Equal" or terms of similar meaning indicate automatic approval of substitute products.

3. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

4. Request constitutes a representation that the Contractor:

   a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

   b. Will provide the same warranty for substitution as for specified product.

   c. Waives claims for additional costs, which may subsequently become apparent.

5. The Owner will determine acceptability of proposed substitution, and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

1.09 REPORTS

A. Weekly Construction Reports: Prepare a weekly construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.

4. High and low temperatures and general weather conditions, including presence of rain or snow.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events.
8. Stoppages, delays, shortages, and losses.
9. Orders and requests of authorities having jurisdiction.
10. Change Orders received and implemented.
11. Construction Change Directives received and implemented.
12. Services connected and disconnected.
13. Equipment or system tests and startups.

1.10 CONTRACT CLOSEOUT

A. Closeout Procedures

1. Submit Closeout Documentation to the Architect/Engineer 10 days prior to the Substantial Completion Date. The Architect/Engineer shall confirm that the Contractor has fulfilled the Contract Closeout Documentation Requirements 10 days prior to the Substantial Completion Date. The Contractor shall not submit for Final Application for Payment until the Architect/Engineer has notified the Owner that Contractor has fulfilled the Contract Closeout Documentation Requirements.

2. When the Owner considers the Work of this contract has reached Substantial Completion, the Contractor and Owner shall sign a Certificate of Substantial Completion. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. This Certificate of Substantial Completion will be prepared by the Architect/Engineer. When the Certificate of Substantial Completion has been signed by the Owner and the Contractor, the completed Certificate of Substantial Completion shall set the date for Substantial Completion of the work or a designated portion of the work.

3. When the Contractor considers the Work of this contract has reached final completion, the Contractor shall 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 OWNER's inspection. This written notification shall be submitted to the Owner 7 calendar days prior to the proposed inspection date. The Contractor shall not call for final inspection of any portion of the Work that is not complete and permanently installed. The Contractor will be found liable for the re-inspection expenses of individuals called to final inspection meetings prematurely.

4. In addition to submittals required by the conditions of the Contract, provide release of all liens, claims and submit final requisition.

5. The Contractor's failures to comply with Closeout Procedures, if the Closeout Documentation Requirements are not completed by the Substantial Completion Date. The Owner reserves the right to recover the costs to complete the Closeout Documentation Requirements from the Retainage. The Owner reserves the right to hire an Architect/Engineer to complete the required Contract Closeout Documentation.

B. Final Cleaning

1. Execute prior to final inspection.

2. Clean site; sweep hard surfaced areas, rake clean other surfaces.

3. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site. Owner will be responsible for cleaning after final acceptance.

C. Project Record Documents

1. Store documents separate from those used for construction.

2. Keep documents current; do not permanently conceal any work until Owner has inspected and required information has been recorded.

3. At Contract Closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION

3.01 FINAL CLEANING

A. Execute final cleaning before final project assessment.

1. Clean Project site, yard, and grounds, in areas disturbed by construction activities of rubbish, waste material, litter, and other foreign substances.

2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits. Rake landscaped areas.

3. Remove tools, construction equipment, machinery, and surplus material from Project site.

4. Clean exposed interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.

5. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

6. Sweep hard flooring surfaces broom clean.

7. Vacuum carpet and similar soft surfaces, removing debris; clean according to manufacturer's recommendations if visible soil or stains remain.

8. Clean transparent materials, including mirrors and glass in doors and windows.

9. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

10. Remove labels that are not permanent.

11. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and other foreign substances.

12. Replace filters of operating equipment.

13. Remove waste and surplus materials, rubbish, and construction facilities from site.

14. Leave Project clean and ready for occupancy.

3.02 STARTING OF SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect/Engineer seven days before start-up of each item.

C. Verify 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.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation before start-up, and to supervise placing equipment or system in operation.

H. Submit a written report stating the equipment or system has been properly installed and is functioning correctly.

3.03 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks before date of Substantial Completion.

B. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at equipment location.

D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

E. Required instruction time for each item of equipment and system is specified in individual sections.

3.04 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

3.05 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, not less than weekly.

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 used.

3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish main floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of the Work.

4. Field changes of dimension and detail.

5. Details not on original Contract drawings.

G. Submit Closeout Documentation to the Architect/Engineer 10 days prior to the Substantial Completion Date. The Architect/Engineer shall confirm that the Contractor has fulfilled the Contract Closeout Documentation Requirements 10 days prior to the Substantial Completion Date.

3.06 OPERATION AND MAINTENANCE DATA

A. Submittal Requirements:

1. Submit three (3) copies of data on 8-1/2 x 11-inch text pages, bound in three (3) separate D side ring binders with durable plastic covers. **Contractor shall also provide O&M Manual in electronic form on CD/DVD**.

2. Prepare binder cover with printed title "OPERATION AND MAINTENANCE", title of project, location, bid number, and subject matter of binder when multiple binders are required. A spine label with same information should also be provided.

3. Subdivide each binder's contents with permanent page dividers, logically organized, with tab titles clearly printed. Tabs should be organized and titled based on the Table of Contents.

B. Manual Submission

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer 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 documents within ten days after acceptance.

3. Submit one copy of completed volumes 15 days before final inspection. Draft copy will be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required before final submission.

4. Submit two sets of revised final volumes in final form within 10 days after Receipt from Owner.

C. Contents

1. Project Summary: The first page in binder should include a paragraph describing the Project followed by a Contact List. The Contact List is to include Owner name along with company name, contact name, address, and telephone number for the Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Drawings: Provide reduced copies of each plan printed on 11 x 17 pages and insert them after the Project Summary page. Also provide a CD/DVD in the back of each binder containing Record Drawing files in Adobe PDF format. AutoCAD drawings shall be delivered as stand-alone without X-references.

3. Table of Contents: Provide a Table of Contents (TOC) for the binder and place behind the reduced plans. If multiple binders are necessary, include a TOC for the entire submission, then a TOC for the individual binder. TOC should be a listing of all products or systems and the 6 required components below each.

4. Product/System Components: Provide the following information for each product and/or system. Provide additional requirements as specified in individual product specification sections.

    a. OVERVIEW and INFORMATION:
        i. Equipment Register: equipment description, model number(s), date of installation, installer w/contact info, supplier w/contact info, manufacturer w/contact info, warranty date, warranty details, estimated life / useful life.
        ii. Description of Complete Installation: A general description of the installation to provide a general understanding of the equipment and its operation.
        iii. Specific System Description: A technical description of each system of the installation, written to ensure it can be clearly understood by persons not familiar with the installation.
        iv. Performance Data: Technically description of the mode of operation of each system provided. This section provides functionality details.
        v. When applicable, include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

    b. OPERATIONS:

i. Manufacturers' technical literature as appropriate. For other than common accessories, where no manufacturer literature is available, provide a precise and concise description of the operation procedure in plain English.
ii. Safe start-up, break-in, routine operation, shut-down, and emergency operations for the equipment installed including a logical step-by-step sequence of instructions for each procedure. Include summer, winter and special operating instructions.
iii. List of all limiting conditions for equipment.
iv. Control Sequence and flow diagrams for the system installed.
v. A legend for color-coded services. A legend of the symbols used on the drawings, unless included on the drawings.
vi. Schedules of the parameter settings of each protective device, including fixed and adjustable circuit breakers, protective relays, adjustable photoelectric switches, pressure switches, and any other control and monitoring device, as established during commissioning and maintenance.

c. MAINTENANCE:
i. Emergency procedures, including telephone numbers for emergency services, and procedures for fault-finding.
ii. Manufacturers' technical literature, as appropriate. Include original manufacturers' parts list, illustrations, assembly drawings, and diagrams required for maintenance.
iii. Detailed recommendations for the frequency of performance of routine maintenance tasks
iv. List of procedures and tasks associated with preventative (routine) maintenance.
v. Procedures for safe trouble shooting, disassembly, repair and reassembly, cleaning, alignment, inspection and adjustment, including a logical step-by-step sequence of instructions for each procedure.
vi. Include summer, winter and special maintenance instructions.
vii. Maintenance Schedule: schedule of the frequency of the required or recommended maintenance, testing and inspection for each type of equipment. The schedule is to include weekly and monthly attendance times.
viii. Installation and dismantling instructions: Instructions for the proper installation and dismantling of the equipment.
ix. Spares and Consumables:
1. Schedule of spares (including bearings) with an expected operating life less than 40,000 hours. Include expected replacement frequency, item label manufacturer name, address, and telephone number, catalogue number name and address of local distributor.
2. Schedule of Consumable Items (oil, grease, belts, bearings) to be used during servicing.
3. Furnish spare parts, consumable items, and extra products in quantities specified in individual specification sections and/or as recommended by manufacturer or requested by Owner. Deliver to project site and place in location as directed by Owner; *obtain receipt before final payment*.

d. TECHNICAL DATA
i. Manufacturers' technical literature assembled specifically for the project and **excluding irrelevant material.**
ii. Each product data sheet marked to clearly identify the specific products and components used in the installation and the data applicable. Additional instructions

and illustrations, as required, to identify and changes to the manufacturers' data or to illustrate the function of each component in the installation.

iii. Provide performance curves and engineering data
iv. Include control diagrams by controls manufacturer as installed.
v. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
vi. Shop drawings.

e. WARRANTIES
i. Provide originals of Manufacturers' warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, *within ten days after completion of applicable item of work.*
ii. All Guarantees
iii. Certificates of compliance for all electrical and plumbing works, where applicable.
iv. If installation is not by the manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's approval of the installing firm.

3.07 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

B. Verify documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Submit before final Application for Payment.

E. Time of Submittals:

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, before final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

END OF SECTION 01 00 00

SECTION 01 35 43
ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.01 DEFINITIONS OF CONTAMINANTS:

A. Sediment: Soil and other debris that has been eroded and transported by runoff water.

B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations, and from community activities.

C. Rubbish: A variety of combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans and bones.

D. Debris: Includes combustible and noncombustible wastes such as ashes, waste materials that result from construction or maintenance and repair work, leaves, and tree trimmings.

E. Chemical Wastes: Includes salts, acids, alkalies, herbicides, pesticides, and organic chemicals.

F. Sanitary Wastes: See Section 01 00 00, para. 1.07. E.1.

G. Sewage: Wastes characterized as domestic sanitary sewage.

H. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

I. Oily Waste: Includes petroleum products and bituminous materials.

1.02 ENVIRONMENTAL PROTECTION REQUIREMENTS:

A. General:

1. Provide and maintain during the life of the contract, environmental protection as defined herein. Provide environmental protective measures as required to control pollution that develops during normal construction practice. Provide also environmental protection measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution.

PART 2 - PRODUCTS: NOT USED

PART 3 - EXECUTION

3.01 PROTECTION OF NATURAL RESOURCES:

A. General:

1. The natural resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specifications.

B. Land Resources:

1. Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special approval of the Owner. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

C. Protection:

1. Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operators. Remove displaced rocks from uncleared areas. Protect monuments, markers and works of art.

D. Repair and Restoration:

1. Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment operations. Obtain approval of the repair or restoration from the Owner prior to its initiation.

E. Temporary Construction:

1. Obliterate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and all other vestiges of construction. Temporary roads, parking areas, and similar temporary use areas shall be graded in conformance with surrounding areas, tilled, and seeded. Include topsoil or nutriment during the seeding operation as necessary to establish a suitable stand of grass.

F. Water Resources:

1. Perform all work in such a manner that any adverse environmental impact on water resources is reduced to a level acceptable to the Owner.

G. Oil Substances:

1. Take special measures to prevent oily or hazardous substances from entering the ground, drainage areas or local bodies of water. Surround all temporary fuel oil, petroleum, or liquid chemical storage tanks with a temporary berm of sufficient size and strength to contain the contents of the tanks in the event of content leakage or spillage.

H. Fish and Wildlife Resources:

1. During the performance of the work take such steps as required to prevent interference or disturbance to fish and wildlife. Do not alter water flows or otherwise significantly disturb native

habitat adjacent to the project area which are critical to fish and wildlife except as may be indicated or specified.

I. Historical and Archaeological Resources:
   1. Carefully preserve and report immediately to the Owner all items having any apparent historical or archaeological interest which are discovered in the course of any construction activities.

3.02 EROSION AND SEDIMENT CONTROL MEASURES:

A. Burn-off:

   1. Burn-off of ground cover is not permitted.

B. Protection of Erodible Soils:

   1. All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and backslopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected soils.

C. Temporary Protection to Erodible Soils:

   1. Utilize the following methods to prevent erosion and control sedimentation.

D. Mechanical Retardation and Control of Runoff:

   1. Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

E. Vegetation and Mulch:

   1. Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such contamination of these and other methods necessary for effective erosion control.

3.03 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES:

A. General:

   1. Handle and dispose of wastes in accordance with this specification section. If directions conflict with another included specification, the other specification shall take precedence.

   2. Track the disposal of all solid, hazardous and chemical wastes and provide Waste Disposal Tracking as required by Local, State and Federal regulations.

3. The preparation, cooking, and disposing of food is strictly prohibited on the project site.

4. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Obliterate signs of temporary construction and activities incidental to construction of permanent work in place.

B. Solid Wastes:

1. Pick up solid wastes and place in containers which are emptied on a regular schedule at the Contractor's expense.

2. Solid wastes shall be recycled whenever practicable.

3. The Contractor shall be responsible for contacting disposal facilities to determine what types of solid waste they will accept. The Contractor shall dispose of solid wastes only at facilities allowed to accept such material per Federal, State, and Local regulations.

C. Sewage, Odor, and Pest Control:

1. Dispose of sewage through connection to an authorized sanitary sewage system. Where such a system is not available, use chemical toilets or comparable effective units and periodically empty wastes. Include provisions for pest control and elimination of odors.

D. Chemical Wastes:

1. Store chemical waste in corrosion resistant containers labeled to identify type of waste and date filled. Remove containers from the project site, and dispose of chemical waste in accordance with Federal, State, and Local regulations. For oil and hazardous material spills which may be large enough to violate Federal, State, or Local regulations, notify the Owner and appropriate regulating Agency immediately.

E. Petroleum Products:

1. Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting Federal, State and Local regulations.

3.04 DUST CONTROL:

A. General:

1. Keep dust down at all times, including nonworking hours, weekends, and holidays. Sprinkle or treat with dust suppressors, the soil at the site, haul roads, and other areas disturbed by operations. Petroleum products will not be used as suppressors. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning of non-particulate debris, such as steel reinforcing bars. No unnecessary shaking of bags is permitted where bagged cement, concrete mortar and plaster is used.

3.05 NOISE:

A. General:
   1. When available, make the maximum use of "low-noise-emission products" as certified by EPA. No blasting or use of explosives is permitted without written permission of the Owner and then only during designated times.

END OF SECTION 01 35 43

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes procedural requirements for cutting and patching.

1.02 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.03 RELATED REQUIREMENTS

A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS

B. Section 01 35 43 – ENVIRONMENTAL PROTECTION

C. Section 02 41 00 – DEMOLITION

1.04 QUALITY ASSURANCE

A. General: Contractor shall take reasonable care prior to all cutting and drilling in order to minimize unintended damage to concealed conduits, cables, pipes, reinforcing steel, etc. In circumstances where the absence of such concealed elements is not established conclusively, utilize detection and mapping technology, e.g., X-ray or Sub-surface Interface Radar (SIR), to locate any such elements that may be present before proceeding with the cutting or drilling work.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational Elements include but are not limited to the following:

1. Air or smoke barriers.
2. Fire-protection systems.
3. Control systems.
4. Communication systems.
5. Conveying systems.
6. Electrical wiring systems.
7. Operating systems of special construction.

D. Miscellaneous Elements: Do not cut and patch elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in an increased maintenance or decreased operational life or safety. Miscellaneous Elements include but are not limited to the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings [that are scheduled to remain].
3. Exterior curtain-wall construction.
4. Equipment supports.

5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.05 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing and In-Place Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, shall match the visual and functional performance of existing materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting, patching and demolition to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to prevent interruption of services to occupied areas.
1. If existing services to occupied areas must be interrupted, coordinate and receive approval of the interruption of services prior to starting work.

3.03 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that shall eliminate evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
      b. Restore damaged pipe covering to its original condition.

D. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   1. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

E. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance. Patch and paint ceilings where existing equipment (i.e. light fixtures) are scheduled to be removed.

F. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

G. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 29

SECTION 02 41 00
DEMOLITION

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 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

1.04 SUBMITTALS

A. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
2. Identify demolition firm and submit qualifications.
3. Include a summary of safety procedures.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Not Used

PART 3 - EXECUTION

3.01 SCOPE

A. Remove portions of existing building as indicated or described.

B. Remove other items indicated, for salvage and relocation as directed by the Owner.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.
2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
3. Provide, erect, and maintain temporary barriers and security devices.
4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

B. Do not begin removal until receipt of notification to proceed from City of Auburn.

C. Protect existing structures and other elements that are not to be removed.

D. If hazardous materials are discovered during removal operations, stop work and notify Architect and City of Auburn; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.03 SELECTIVE DEMOLITION FOR 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 demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

C. Protect existing work to remain.
   1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   2. Repair adjacent construction and finishes damaged during removal work at no additional cost to the Owner.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 41 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

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 SECTION INCLUDES

A. Floors and slabs on grade.

B. Concrete reinforcement.

C. Joint devices associated with concrete work.

D. Concrete curing.

E. Concrete floor shim & floor level transitions.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2010.

B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010.

C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.

E. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Billet-Steel Bars for Concrete Reinforcement; 2014.

G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.

H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

J. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.

K. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

L. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2013).

M. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.04 SUBMITTALS

A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

B. Mix Design: Submit proposed concrete mix design.

1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures. Minimum compressive strength shall be 3000 psi @ 30 days.

C. Samples: Submit samples of under-slab vapor retarder to be used.

1.05 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2- PRODUCTS

2.01 REINFORCEMENT

A. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.

1. WWR Style: 4 x 8-W6 x W10.

B. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C 33.

C. Water: Clean and not detrimental to concrete.

2.03 ACCESSORY MATERIALS

A. Under-slab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by

manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.

1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.

2.04 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

1. Products:

a. SpecChem, LLC; Strong Bond Acrylic Bonder.

b. W.R. Meadows, Inc.; ACRY-LOK-.

B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

2.05 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.

1. Products:

a. Dayton Superior Corporation; AquaFilm Concentrate J74.

b. SpecChem, LLC; SpecFilm Concentrate or SpecFilm RTU.

c. W.R. Meadows, Inc; Evapre or Evapre-RTU.

2.06 FLOOR SHIM & FLOOR LEVEL TRANSITIONS

A. Cementious shim or underlayment for concrete slab smoothing or repair.

1. Products:

a. Ardex Forty finish or approved equal product; Ardex Americas.

PART 3- EXECUTION

3.01 PREPARATION

A. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use latex bonding agent only for non-load-bearing applications.

C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints a minimum of 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.02 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire. Provide mechanical connection to existing slab.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 SLAB JOINTING

A. Pin new slab to existing slab with #4 bars at 24” on center.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:

1. Exposed Concrete Floors: 1/4 inch in 10 ft.
2. Under Seamless Resilient Flooring: 1/4 inch in 10 ft.
3. Under Carpeting: 1/4 inch in 10 ft.

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

A. Repair surface defects, immediately after removing formwork.

B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.07 FLOOR SHIM & LEVEL TRANSITIONS

A. Follow manufacturer’s instructions for preparation, installation and curing.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.

2. Final Curing: Begin after initial curing but before surface is dry.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements shall be replaced at no additional cost to the Owner.

3.09 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION 03 30 00

SECTION 04 05 11
MASONRY MORTARING AND GROUTING

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 SECTION INCLUDES

A. Mortar for masonry including crack repair.

B. Grout for masonry.

1.03 RELATED REQUIREMENTS

A. Section 04 27 31 - Reinforced Unit Masonry: Installation of mortar and grout.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Products and execution for grouting steel door frames installed in masonry.

1.04 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2010.

C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.

E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.

F. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.

I. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar; 2011b.

J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

K. ASTM C476 - Standard Specification for Grout for Masonry; 2010.

1.05 SUBMITTALS

A. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 - PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

B. Mortar Mix Designs: ASTM C270, Property Specification.

1. Interior, Loadbearing Masonry: Type N.

C. Grout Mix Designs:

1. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.

a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.

b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.02 MATERIALS

A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.

1. Type: Type N.

2. Color: Standard gray.

B. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.

   1. Color: Standard gray.

C. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

D. Portland Cement: ASTM C150.

   1. Type: Type I - Normal.

   2. Color: Standard gray.

E. Masonry Cement: ASTM C91.

   1. Type: Type N.

F. Hydrated Lime: ASTM C207, Type S.

G. Quicklime: ASTM C5, non-hydraulic type.

H. Mortar Aggregate: ASTM C144.

I. Grout Aggregate: ASTM C404.

J. Water: Clean and potable.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

D. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified or repair of cracks is required.

B. Install mortar and grout at new steel lintel installations.

END OF SECTION 04 05 11

SECTION 04 27 31
REINFORCED UNIT MASONRY

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 SECTION INCLUDES

A. Concrete Block.

B. Concrete Brick.

C. Mortar and Grout.

D. Reinforcement and Anchorage.

E. Lintels.

F. Accessories.

1.03 RELATED REQUIREMENTS

A. Section 04 05 11 - Masonry Mortaring and Grouting.

B. Section 05 50 00 - Metal Fabrications.

C. Section 07 90 05 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.04 REFERENCE STANDARDS

A. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.

B. ASTM C55 - Standard Specification for Concrete Building Brick; 2011.

1.05 SUBMITTALS

A. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar and grout.

B. Shop Drawings: Indicate bar sizes, spacing’s, reinforcement quantities, bending and cutting schedules, reinforcement supporting and spacing devices, and accessories.

C. Design Data: Indicate required mortar strength, unit assembly strength in each plane, and supporting test data.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.07 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.

2. Special Shapes: Provide non-standard blocks configured for corners.

B. Concrete Brick:

1. Size: As required for in-filled openings.

2. Special Shapes: Provide non-standard brick configured for corners.

2.02 MORTAR AND GROUT MATERIALS

A. Mortar and Grout: As specified in Section 04 05 11.

2.03 REINFORCEMENT AND ANCHORAGE

A. Single Wythe Joint Reinforcement: Truss type; ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

B. Provide vertical pins, #3 minimum to anchor wall to slab.

2.04 ACCESSORIES

A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Clean reinforcement of loose rust.

C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar as work progresses.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.05 REINFORCEMENT AND ANCHORAGE

A. Joint Reinforcement: Install horizontal joint reinforcement 8 inches on center, solid grout all new walls.

B. Vertical Reinforcement and Anchorage: Pin to concrete slab at 24 inches maximum on center, 8 inches maximum from openings and ends of walls.

C. Install steel lintels as shown or described.

3.06 GROUTING

A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.

B. Low-Lift Grouting:

1. Limit height of pours to 16 inches.
2. Limit height of masonry to 16 inches above each pour.
3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

3.07 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

C. Size control joint in accordance with Section 07 90 05 for sealant performance.

3.08 TOLERANCES

A. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

B. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

C. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

3.09 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.10 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

3.11 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 27 31

SECTION 05 40 00
COLD-FORMED 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 SECTION INCLUDES

A. Formed steel stud framing and bridging.

1.03 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.04 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

C. ASTM C955 - Standard Specification for Non- Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.

D. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

E. ASTM C754 – Installation of non-bearing steel studs with gypsum board.

1.05 SUBMITTALS

A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.

B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

PART 2- PRODUCTS

2.01 FRAMING SYSTEM

A. Provide primary and secondary non-bearing stud framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Provide galvanized 20 GA. minimum.

2.03 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Plates, Gussets, Clips: Formed Sheet Steel, thickness determined for conditions encountered; finish to match framing components.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.04 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

PART 3- EXECUTION

3.01 INSTALLATION OF COMPONENTS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

3.02 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch.

B. Maximum Variation of any Member from Plane: 1/4 inch.

END OF SECTION 05 40 00

SECTION 05 50 00

METAL FABRICATIONS

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 SECTIONS INCLUDES

A. Shop fabricated steel.

1.03 RELATED REQUIREMENTS

A. Section 09 90 00 - Painting and Coating: Paint finish.

1.04 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.

B. ASTM A153/A153M – N/A

C. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength; 2012.

E. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.

F. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc.; 2011.

1.05 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and details where applicable.

PART 2 - PRODUCTS

2.01 MATERIALS – STEEL

A. Steel Sections: ASTM A36/A36M, ASTM A500 ASTM A53.

B. Plates: ASTM A283, A36.

C. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.

D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FINISHES – STEEL

A. Prime Painting: One coat.

B. Finish Painting: One coat.

2.03 FABRICATION TOLERENCES

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.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

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 indicated.

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 05 50 00

SECTION 06 10 00
ROUGH CARPENTRY

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 SECTION INCLUDES

A. Non-structural dimension lumber framing.

B. Miscellaneous framing and sheathing.

C. Concealed wood blocking, nailers, and supports.

D. Miscellaneous wood nailers, furring, and grounds.

1.03 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.04 SUBMITTALS

A. Product Data: Provide technical data on wood products and materials.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.02 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.03 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.04 CLEANING

A. Waste Disposal.

1. Comply with applicable regulations.

2. Do not burn scrap on project site.

3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 10 00

SECTION 06 20 00
FINISH CARPENTRY

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 SECTION INCLUDES

A. Misc. wood trim.

1.03 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 09 90 00 - Painting and Coating: Painting and finishing of finish carpentry items.

1.04 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.06 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.

2. Manufacturer’s standard color selections.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 - PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Wood trim.

2.02 BOARD STOCK.

A. #1 Pine trim or Shelves.

2.03 FASTENINGS

A. Adhesive suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

2.04 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 20 00

SECTION 07 21 00
THERMAL INSULATION

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 SECTION INCLUDES

A. Batt insulation and vapor retarder in exterior walls and roof where existing penetrations are removed.

B. Batt insulation in Cold- Formed Metal Framing for sound insulation.

1.03 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing.

B. Section 06 10 00 - Rough Carpentry: Construction for batt insulation.

1.04 REFERENCE STANDARDS

A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

1.05 SUBMITTALS

A. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

PART 2 - PRODUCTS

2.01 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.

2.02 ACCESSORIES

A. Sheet Vapor Retarder: White polyethylene film for above grade application, 10 mil thick.

B. Tape, plastic, white.

PART 3 - EXECUTION

3.01 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. At Cold-Formed Metal Framing do not install Vapor Retarder.

3.02 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 21 00

SECTION 07 90 05
JOINT SEALERS

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 SECTION INCLUDES

A. Sealants and joint backing.

1.03 RELATED REQUIREMENTS

A. Section 08 80 00 - Glazing: Glazing sealants and accessories.

B. Section 08 11 13 - Hollow Metal Doors & Frames

.

1.04 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2010.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

1.05 SUBMITTALS

A. Product Data: Provide data indicating sealant chemical characteristics.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

A. Correct defective work within a five year period after Date of Substantial Completion.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.01 SEALANTS

A. Type A - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.

1. Applications: Use for:

a. Concealed sealant bead in sheet metal work.

B. Type B - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.

1. Color: Match adjacent finished surfaces.

2. Applications: Use for:

a. Interior wall and ceiling control joints.

b. Joints between door and window frames and wall surfaces.

c. Other interior joints for which no other type of sealant is indicated.

2.02 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 PREPARATION

A. Remove loose materials and foreign matter that could 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 C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.02 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 C1193.

C. Install bond breaker where joint backing is not used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Tool joints concave.

3.03 CLEANING

A. Clean adjacent soiled surfaces.

3.04 PROTECTION

A. Protect sealants until cured.

END OF SECTION 07 90 05

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

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 SECTION INCLUDES

A. Non-fire-rated steel interior doors and frames.

B. Thermally insulated exterior steel doors and frames.

1.03 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 08 80 00 - Glazing.

C. Section 09 90 00 - Painting and Coating.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.

C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

E. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

F. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

H. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

I. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2006.

1.05 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, thermal performance, and identifying location of different finishes, if any.

1.06 QUALITY ASSURANCE

A. Maintain at the project site a copy of all reference standards dealing with installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 - PRODUCTS

2.01 DOORS AND FRAMES

A. Requirements for All Doors and Frames:

1. Accessibility: Comply with ICC A117.1 and ADA Standards.

2. Door Top Closures: Flush with top of faces and edges.

3. Door Texture: Smooth faces.

4. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.

5. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.02 STEEL DOORS

A. Exterior Doors:

1. Core: Insulated.
2. Thickness: 1 3/4".
3. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M.
4. Insulating Value: U-value of 0.70, when tested in accordance with ASTM C1363.
5. Weatherstripping: At door edge or frame on head, jambs and sill.

B. Interior Doors, Non-Fire-Rated:

1. Grade: ANSI A250.8 - SDI-100.
2. Thickness: 1 3/4".

2.03 STEEL FRAMES

A. General:

1. Comply with the requirements of grade specified for corresponding door.
2. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
3. Frames in Masonry Walls: Size to suit masonry coursing with head member to fill opening without cutting masonry units.

B. Exterior Door Frames: Face welded, seamless with joints filled.

1. Weatherstripping: At door edge or frame on head, jambs and sill.

C. Interior doors shall be KD.

2.04 ACCESSORY MATERIALS

A. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

B. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

C. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.05 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 - EXECUTION

3.01 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.02 INSTALLATION

A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Coordinate installation of hardware.

3.03 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 11 13

SECTION 08 36 13

ROLL-UP DOORS

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 SECTION INCLUDES

A. Overhead coiling roll-up door.

B. Operating hardware and supports and track.

1.03 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Steel channel opening frame.

B. Section 06 10 00 - Rough Carpentry: Rough wood framing and blocking for door opening.

1.04 REFERENCE STANDARDS

A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a.

1.05 SUBMITTALS

A. Operation Data: Include normal operation, troubleshooting, and adjusting.

B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer: Company specializing in performing the work of this section with minimum 10 years of experience.

1.07 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Door Company. Steel roll-up door.

B. Other Acceptable Manufacturers:
   1. Clopay Corporation: www.clopaydoor.com. Steel roll-up door.
   2. Wayne-Dalton Corporation: www.wayne-dalton.com. Model 500 steel roll-up door.

2.02 MATERIALS

A. Springs: Heavy duty/high cycle springs.

B. Track and operator to match door style, size and weight.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare opening to permit correct installation of door unit.

3.02 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

C. Fit and align door assembly including hardware.

F. Install perimeter trim.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 1/16 inch.

B. Maximum Variation from Level: 1/16 inch.

C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.

D. Maintain dimensional tolerances and alignment with adjacent work.

3.04 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

3.05 CLEANING

A. Clean doors and frames in accordance with manufacturer's instructions.

3.06 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION 08 36 13

SECTION 08 42 29
AUTOMATIC ENTRANCES

PART 1 GENERAL

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.01 SECTION INCLUDES

A. Packaged power-operated door openers.

1.03 REFERENCE STANDARDS

A. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; Builders Hardware Manufacturers Association; 2011 (ANSI/BHMA A156.10).

1.04 SUBMITTALS

A. Shop Drawings:
   1. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.

B. Product Data: Provide data on system components, sizes, features, and finishes.

C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.

D. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.

E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Auburn's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 WARRANTY

A. Provide two year manufacturer warranty.

PART 2 PRODUCTS

2.01 POWER OPERATED DOORS

A. All Power Operated Doors: Provide products that comply with the requirements of the authorities having jurisdiction; unless otherwise indicated, provide equipment selected for the actual weight of the doors and for medium to heavy pedestrian traffic. Example: Gyrotec 710, surface mounted, bottom access, out swing with wireless switch.
   1. Swinging Door Operators: In addition to other requirements, provide surface mounted door operator with automatic closer.
      a. Finish exposed equipment components to match door and frame finish.

2.03 CONTROLS

A. Push Plate Actuator: Standard wall mounted, surface mounted momentary contact type; satin stainless steel plate; 3 inches in diameter; labeled PUSH.

B. Provide both interior and exterior push plate actuator.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install equipment in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust door equipment for correct function and smooth operation.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.06 MAINTENANCE

A. Provide service and maintenance of operating equipment for one year from Date of Substantial Completion, at no extra charge to City of Auburn.

END OF SECTION 08 42 29

SECTION 08 43 13

ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications, apply to this Section.

1.01 SECTION INCLUDES

A. Aluminum Doors and Frames.

B. Fixed Glass / Sidelight and Frame.

B. Door Weatherstripping.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 – Door Hardware: Hardware items other than specified in this section.

B. Section 08 42 29 – Automatic Entrances.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

C. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 WARRANTY

A. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

B. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 - PRODUCTS

2.01 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Glazing Position: Centered (front to back).

2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

3. Finish: Pigmented organic coatings.

a. Factory finish all surfaces that will be exposed in completed assemblies.

b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.

5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.

6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
8. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

2.02 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Glazing stops: Flush.
B. Swing Doors: Glazed aluminum. Above mid rail, insulated panel below.
   1. Thickness: 1-3/4 inches.
   2. Top Rail: 4 inches wide.
   3. Mid rail: 6 inch high.
   3. Vertical Stiles: 4-1/2 inches wide.
   4. Bottom Rail: 12 inches wide.
   5. Glazing Stops: Square.
C. Sidelight: Match appearance of door.

2.03 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Fasteners: Stainless steel.
C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.04 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

2.05 HARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Other Door Hardware: Storefront manufacturer's standard type to suit application.

1. Finish on Hand-Contacted Items: Polished chrome.

2. For each door, include butt hinges, pivots, push handle, pull handle, exit device, narrow stile handle latch, and closer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Set thresholds in bed of mastic and secure.

K. Install hardware using templates provided.

L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.02 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.03 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.04 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.05 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION 08 43 13

SECTION 08 71 00
DOOR HARDWARE

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 SECTION INCLUDES

A. Hardware for hollow steel doors including:
   1. Hinges.
   2. Exit devices.
   3. Closers.
   4. Push bars and pull handles.
   5. Floor or wall stops.
   6. Installation of lock cylinders provided under this section.
   7. Thresholds.
   8. Integral weatherstripping, seals and door gaskets.

1.03 RELATED REQUIREMENTS

A. Section 08 11 13 – Hollow Metal Doors and Frames.

B. Section 08 36 13 – Roll-Up Door.

C. Section 08 43 13 – Aluminum-Framed Storefronts

1.04 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. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association; 2008 (ANSI/BHMA A156.3).

D. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; 2008 (ANSI/BHMA A156.4).

E. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; 2010 (ANSI/BHMA A156.8).

F. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; 2012 (ANSI/BHMA A156.22).

G. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

H. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

J. NFPA 101 - Life Safety Code; National Fire Protection Association; 2012.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

1.06 SUBMITTALS

A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

B. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.07 QUALITY ASSURANCE

A. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with 5 years of experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

PART 2 - PRODUCTS

2.01 DOOR HARDWARE - GENERAL

A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide all items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.
   3. Applicable provisions of NFPA 101, Life Safety Code.

2.02 HINGES

A. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors having closers.
   3. Provide hinges in the quantities indicated.
   4. Provide non-removable pins on exterior out-swinging doors.
   5. Where electrified hardware is mounted in door leaf, provide power transfer hinges.

B. Quantity of Hinges Per Door:
   1. Doors From 60 inches high up to 90 inches high: Three hinges.

2.03 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. Hardware Sets indicate locking functions required for each door.
   2. If no hardware set is indicated for a swinging door provide an office lockset.
   3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed. Coordinate with Owner for final keying.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.04 EXIT DEVICES

A. Locking Functions: Functions as defined in BHMA A156.3, and as follows:
   1. Entry/Exit, Free Swing: Key outside retracts latch, latch holdback (dogging) for free swing during occupied hours, not fire-rated; outside trim, lever or pull.

2.05 CLOSERS

A. Closers: Complying with BHMA A156.4.

1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
2. Provide a door closer on every exterior door.
3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
5. Provide closers per door schedule.

2.06 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.

1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide floor stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

2.07 GASKETING AND THRESHOLDS

A. Gaskets: Complying with BHMA A156.22.

1. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
    a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
2. On each exterior door, provide door bottom sweep, unless otherwise indicated.

B. Thresholds:

1. At each exterior door, provide a threshold unless otherwise indicated. Low profile shall be ½” high ADA compliant.

2.08 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:

1. Kickplate: Provide on push side of every door with closer, except storefront and all-glass doors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

B. Verify repairs necessary to existing door hardware and weatherstripping.

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 center line of hardware item:

1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."

3.03 ADJUSTING

A. Adjust hardware for smooth operation.

3.04 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Do not permit adjacent work to damage hardware or finish.

END OF SECTION 08 71 00

SECTION 08 80 00
GLAZING

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 SECTION INCLUDES

A. Glass, tempered and wired glass.

B. Glazing compounds and accessories.

1.03 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

1.04 REFERENCE STANDARDS

A. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).

B. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

1.05 SUBMITTALS

A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.01 GLAZING TYPES

A. Type S-3 - Wired Safety Glazing: Non-fire-rated.

1. Applications: Provide this type of glazing in the following locations:

a. Glazed door lights.

b. Locations indicated on the drawings.

3. Tint: Clear.

4. Thickness: 1/4 inch.

2.02 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; hardness of 5 to 30 Durometer Shore "A"; coiled on release paper; black color.

C. Glazing Clips: Manufacturer's standard type.

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

3.02 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.03 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.04 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION 08 80 00

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

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 SECTION INCLUDES

A. Gypsum wallboard.

B. Joint treatment and accessories.

1.03 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.04 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.

B. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

C. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

D. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011

E. ASTM C1002 - 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; 2007 (Reapproved 2013).

F. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

G. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

1.05 SUBMITTALS

A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 - PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

1. See PART 3 for finishing requirements.

2.02 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Thickness:
    a. Vertical Surfaces: 5/8 inch.
    b. Ceilings: 5/8 inch.

2.03 ACCESSORIES

A. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.

1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
2. Ready-mixed vinyl-based joint compound.
3. Chemical hardening type compound.

B. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.

C. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

3.03 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.05 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09 21 16

SECTION 09 51 00

ACOUSTICAL CEILINGS

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 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.03 RELATED REQUIREMENTS

A. Section 07 21 00 – Thermal Insulation: Acoustical insulation.

B. Section 26 05 00 – Basic Electrical Materials and Methods: Light fixtures in ceiling system.

1.04 REFERENCE STANDARDS

A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2007.

B. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.05 ADMINISTRATIVE REQUIREMENTS

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. Do not install acoustical units until after interior wet work is dry.

1.06 SUBMITTALS

A. Shop Drawings: Indicate grid layout and related dimensioning.

B. Product Data: Provide data on suspension system components.

C. Samples: Submit two samples 6"x6" inch in size illustrating material and finish of acoustical units.

D. Maintenance Materials: Furnish the following for the City of Auburn's use in maintenance of project.
   1. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.07 QUALITY ASSURANCE

A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance if indicated.

1.08 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:

   1. CertainTeed Ceilings, PERFORMA Fine Fissured, HHF-197
   2. Provide CertainTeed Ceilings PERFORMA, Vinylrock 1142-CRF-1 in toilet rooms.

2.02 SUSPENSION SYSTEM(S)

A. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.
   3. 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. (no overlaps)

C. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.

D. 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.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

C. 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.

D. 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.

E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

F. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

G. Do not eccentrically load system or induce rotation of runners.

H. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install with continuous gasket.
   2. Use longest practical lengths.

3.03 INSTALLATION - ACOUSTICAL 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. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

G. Install hold-down clips on each panel to retain panels tight to grid system in Vending Room #111.

3.04 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 09 51 00

SECTION 09 65 00
RESILIENT FLOORING

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 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.03 REFERENCE STANDARDS

A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2010)e1.

B. ASTM F1344 - Standard Specification for Rubber Floor Tile; 2012.

C. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2004 (reapproved 2010).

D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008.

1.04 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Selection Samples: Submit manufacturer's complete set of color samples for Owner’s initial selection.

C. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

E. Maintenance Materials: Furnish the following for City of Auburn's use in maintenance of project.

1. Extra Flooring Material: 50 square feet of each type and color.

2. Extra Wall Base: 25 linear feet of each type and color.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect roll materials from damage by storing on end.

1.06 FIELD CONDITIONS

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.

PART 2 - PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness, and:

1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
2. Size: 12 x 12 inch.
3. Thickness: 0.125 inch.
4. Pattern: Marbleized.

2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:

1. Height: 4 inch.
2. Thickness: 0.125 inch thick.
3. Finish: Satin.
4. Color: Color as selected from manufacturer's standards.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Filler for Coved Base: Plastic.

C. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

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 resilient base.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.

1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

3.05 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

3.08 SEALING & WAXING

A. One coat of sealer shall be applied after floor cleaning.

B. Apply 3 coats of wax after sealing.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 09 65 00

SECTION 09 68 15

RUBBER FLOOR TILE

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 SECTION INCLUDES

A. Interlocking 3/8” thick rubber fitness flooring.

1.02 RELATED REQUIREMENTS

A. Section 09 65 00 – Resilient Flooring.

1.03 REFERENCE STANDARDS

A. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2011.

1.04 SUBMITTALS

A. Shop Drawings: Indicate layout of tiles.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

D. Maintenance Materials: Furnish the following for owner's use in maintenance of project.
   1. Extra Tiles: Quantity equal to 5 percent of total installed.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Rubber Tile Type-1: Guardian Interlock System, 4 ft. by 4 ft.., 3/8” thick.
   1. Color: Black.

B. Manufactured by Humane Manufacturing Company LLC
805 Moore St., Baraboo, WI 53913, (800)369-6263
www.humanemfg.com
C. Other similar products by other manufacturer's may be submitted for approval.

2.02 ACCESSORIES

A. Sub-Floor Filler: White premix latex.
B. Adhesives are not required for the installation of this product.
C. Provide transition beveled edges where rubber floor tile meets other flooring materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install rubber tile in accordance with manufacturer's instructions.

C. Trim rubber tile neatly at walls and around interruptions.

D. Provide transitions to other flooring materials.

3.04 CLEANING

A. Clean and vacuum rubber floor tile surfaces.

END OF SECTION 09 68 15

SECTION 09 90 00
PAINTING AND COATING

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 SUBMITTALS

A. Provide submittals for all paint systems and types.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

2.02 PAINTS AND COATINGS – GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.

1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Supply each coating material in quantity required to complete entire project's work from a single production run.

3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:

1. Provide coatings that comply with the most stringent requirements specified in the following:

a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS – EXTERIOR: For non-factory finished metals.

A. Paint ME-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:

1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.

2. Semi-gloss: Two coats of alkyd enamel.

2.04 PAINT SYSTEMS – INTERIOR: For new and existing surfaces.

A. Paint I-OP - All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry, wood, uncoated steel, shop primed steel, and aluminum.

1. Applications: See 3.06, Schedule this section.

2. Two top coats and one coat primer.

3. Top Coat(s): MPI Interior Latex; MPI #43, 44, 52, 53, 54, 114.

4. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.

5. Primer(s): As recommended by manufacturer of top coats.

B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:

1. Applications: See 3.06, Schedule this section.

2. Two top coats and one coat primer.

3. Top Coat(s): MPI High Performance Architectural Interior Latex; MPI #139,140, 141.

4. Semi-Gloss: MPI gloss level 5;

5. Primer(s): As recommended by manufacturer of top coats.

C. Paint I-OP-MD-WC - Medium Duty Vertical/Overhead: Including gypsum board, plaster, concrete, concrete masonry, uncoated steel, shop primed steel, galvanized steel and aluminum.

1. Applications: See 3.06, Schedule this section.

2. Two top coats and one coat primer.

3. Top Coat(s): MPI Interior Epoxy-Modified Latex; MPI #115, 215.

4. Semi-Gloss: MPI gloss level 5;

5. Primer(s): As recommended by manufacturer of top coats.

D. Paint - Special for existing fiberglass faced (FRP) blocks in existing rooms.

1. Sherwin Williams Extreme Bond interior/exterior bonding primer B51W00150.

2. Sherwin Williams Pre-Catalized Waterbased Epoxy K45-150 Series, eg-shell.

3. Primer and 2 top coats.
4. Color selected by owner.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that new surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine existing surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. 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. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects including rust and scaling.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. 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.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

K. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

L. Uncorroded 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 or power tool 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.

M. 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.

N. Interior Wood Surfaces 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.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

G. All colors shall be selected by owner.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Touch-up damaged coatings after Substantial Completion.

3.06 SCHEDULE - PAINT SYSTEMS

A. Concrete, Concrete Block,: Finish all surfaces exposed to view.
   1. Interior: I-OP, semi-gloss

B. Gypsum Board: Finish all surfaces exposed to view.
   1. Interior Ceilings and Bulkheads: I-OP-, flat.
   2. Interior Walls: I-OP, satin.

C. Wood: Finish all surfaces exposed to view.
   1. Interior trim and frames: I-OP-MD-DT, semi-gloss.

D. Steel Doors and Frames: Finish all interior surfaces exposed to view; I-OP-MD-DT, semi-gloss.

E. Steel Fabrications: Finish all surfaces exposed to view, except Above 8 ft. floor.
   1. Interior: I-OP-MD-WC, semi-gloss.
   2. Above 8 ft. use dry fall I-OP-DF, flat.

F. Shop-Primed Metal Items: Finish all surfaces exposed to view.
   1. Finish the following items:
      a. Exposed surfaces of lintels.
      b. Mechanical equipment.
      c. Electrical equipment.
   2. Exterior: Steel Doors and Frames. ME-OP-2A

G. Special primer & top coat for existing fiberglass blocks.

END OF SECTION 09 90 00

SECTION 10 14 00

SIGNAGE

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 SECTION INCLUDES

A. Room and door signs.

B. ADA signage with braille.

C. Occupant load sign.

1.03 RELATED REQUIREMENTS

A. Section 26 00 00 – Interior Lighting: Exit signs required by code.

B. Section 08 42 29 – Automatic Entrances.

1.04 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; International Code Council; 2009 (ANSI).

1.05 SUBMITTALS

A. 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.

B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by room number.

C. Store tape adhesive at normal room temperature.

1.07 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 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide signs as indicated on drawings.

1. Sign Type: Flat signs with engraved panel media as specified.

2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.

3. Character Height: 3/4 inch.

4. Sign Height: 2 inches, unless otherwise indicated.

5. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN, and braille.

C. Building occupant load sign.

1. Locate per plans in room 100.

2. Sign Type: 12” by 12”

3. Character height, 1-1/2 inch.

4. Top of sign shall be 60 inches above the floor.

2.02 SIGN TYPES

A. Flat Signs: Signage media without frame.

1. Edges: Square.

2. Corners: Square.
3. Wall Mounting of One-Sided Signs: Tape adhesive.

B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: Black
4. Character Color: White.

2.03 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
1. Total Thickness: 1/16 inch.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs where indicated:
1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.

D. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION 10 14 00

SECTION 10 21 13
METAL TOILET COMPARTMENTS

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 SECTION INCLUDES

A. Metal toilet compartments.

B. Urinal screens.

1.03 RELATED REQUIREMENTS

A. Section 10 28 00 – Toilet and Bath Accessories.

1.04 REFERENCE STANDARDS

A. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.06 SUBMITTALS

A. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

B. Product Data: Provide data on panel construction, hardware, available colors and accessories.

C. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Toilet Compartments: Powder coated steel, floor-mounted headrail-braced.

B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound deadening core, formed and closed edges; corners made with corner clips or mitered, welded, and ground smooth.

1. Panel Faces: 20 gage, 0.0359 inch.
2. Door Faces: 22 gage, 0.0299 inch.
3. Pilaster Faces: 20 gage, 0.0359 inch.
4. Reinforcement: 12 gage, 0.1046 inch.
5. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.

C. Door and Panel Dimensions:

1. Thickness: 1 inch.
2. Door Width: 24 inch.
3. Door Width for Handicapped Use: 36 inch, out-swinging.
4. Height: 58 inch.

D. Pilasters: 1-1/4 inch thick, of sizes required to suit compartment width and spacing.

E. Urinal Screens: Wall mounted with two panel brackets, and floor-to-ceiling vertical upright consisting of pilaster anchored to floor and ceiling.

2.02 ACCESSORIES

A. Pilaster Shoes: Formed chromed steel with polished finish, 3 inch high, concealing floor fastenings.

1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow chrome-plated steel tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.

C. Brackets: Polished chrome-plated non-ferrous cast metal.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

E. Hardware: Polished chrome plated non-ferrous cast metal:

1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
2. Nylon bearings.
3. Thumb turn or sliding door latch with exterior emergency access feature.
4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.

5. Coat hook with rubber bumper; one per compartment, mounted on door.
6. Provide door pull for out-swinging doors.

2.03 FINISHING

A. Powder Coated Steel Compartments: Clean, degrease, and neutralize. Follow immediately with a phosphatizing treatment, prime coat and two finish coats powder coat enamel.

B. Color selection shall be by owner.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. 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. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.

B. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10 21 13

SECTION 10 28 00

TOILET & BATH, ACCESSORIES

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 SECTION INCLUDES

A. Accessories for toilet rooms.

B. Grab bars.

C. Mirrors

D. Shower rods and curtains.

E. Owner furnished toilet accessories.

1.03 RELATED REQUIREMENTS

A. Section 10 21 13 - Metal Toilet Compartments.

1.04 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. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2014e1.

C. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.

1.05 SUBMITTALS

A. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

C. Proposed mounting locations of Owner supplied accessories if not similar to items shown on drawings.

PART 2 - PRODUCTS

2.01 TOILET ROOM ACCESSORIES

A. Toilet Paper Dispenser, Soap Dispenser and Paper Towel Dispenser: Provided by Owner.

B. Grab Bars: Stainless steel, nonslip grasping surface finish.

1. Standard Duty Grab Bars:

a. Push/Pull Point Load: 250 pound-force, minimum.

b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.

c. Length and Configuration: As indicated on drawings.

C. Shower Rods and Curtains.

1. Stainless steel, 1 inch diameter with mounting flanges.

2. Length and configuration: As indicated on drawings.

3. Curtain shall be heavy duty reinforced water and mold resistant fabric.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify Owner supplied accessories.

3.02 PREPARATION

A. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings including Owner supplied items.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings.

1. Grab Bars: As indicated on the drawings.

2. Mirrors: 40 inch, measured to bottom of mirrored surface to floor.

3. Shower Rods at 72”.

4. Owner supplied accessories: As shown on drawings or as directed by Owner.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 10 28 00

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING 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. This Section includes the following hangers and supports for plumbing system piping and equipment:

1. Steel pipe hangers and supports.
2. Equipment supports.

1.3 DEFINITIONS

A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 SUBMITTALS

A. Product Data: For the following:

1. Steel pipe hangers and supports.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:

1. Pipe stands. Include Product Data for components.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Available Manufacturers:

1. AAA Technology & Specialties Co., Inc.
2. Bergen-Power Pipe Supports.
3. Empire Industries, Inc.
4. ERICO/Michigan Hanger Co.
5. Globe Pipe Hanger Products, Inc.
6. Grinnell Corp.

C. Galvanized, Metallic Coatings: Pre-galvanized or hot dipped.

2.3 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.4 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

C. Use padded hangers for piping that is subject to scratching.

D. 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 non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30.
2. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24, requiring clamp flexibility and up to 4 inches of insulation.
3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24, if little or no insulation is required.
4. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated stationary pipes, NPS 3/4 to NPS 8.

E. 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 20.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

B. 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.

C. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

D. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

E. Insulated Piping: Comply with the following:

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 according to 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 smooth bearing surface.

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 and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 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.

END OF SECTION 22 05 29

SECTION 22 07 00
PLUMBING INSULATION

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. Insulation Materials:
   a. Cellular glass.
2. Adhesives.
3. Mastics.
4. Sealants.
5. Field-applied jackets.
6. Tapes.
7. Securements.
8. Corner angles.

B. Related Sections include the following:
1. Division 23 Section "HVAC Insulation."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, thickness, and jackets (both factory and field applied, if any).

B. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
3. Detail removable insulation at piping specialties, equipment connections, and access panels.
4. Detail application of field-applied jackets.

C. Qualification Data: For qualified Installer.

D. 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.

E. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application and equipment Installer for equipment 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.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

E. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Cell-U-Foam Corporation; Ultra-CUF.
    b. Pittsburgh Corning Corporation; Foamglas Super K.

2. Block Insulation: ASTM C 552, Type I.
3. Special-Shaped Insulation: ASTM C 552, Type III.
4. Board Insulation: ASTM C 552, Type IV.
5. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
6. Preformed Pipe Insulation with Factory-Applied ASJ ASJ-SSL: Comply with ASTM C 552, Type II, Class 2.
7. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Cellular-Glass, Phenolic, Polyisocyanurate, and Polystyrene Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Childers Products, Division of ITW; CP-96.
    b. Foster Products Corporation, H. B. Fuller Company; 81-33.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Dow Chemical Company (The); 739, Dow Silicone.
    b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
    c. P.I.C. Plastics, Inc.; Welding Adhesive.
    d. Speedline Corporation; Speedline Vinyl Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Products: Subject to compliance with requirements, provide the following provide one of the following:

    a. Childers Products, Division of ITW; CP-35.
    b. Foster Products Corporation, H. B. Fuller Company; 30-90.
    c. ITW TACC, Division of Illinois Tool Works; CB-50.
    d. Marathon Industries, Inc.; 590.
    e. Mon-Eco Industries, Inc.; 55-40.
    f. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

2.4 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Cellular-Glass, Phenolic, and Polyisocyanurate Products: Subject to compliance with requirements, provide one of the following:

    a. Childers Products, Division of ITW; CP-76.
    b. Foster Products Corporation, H. B. Fuller Company; 30-45.
    c. Marathon Industries, Inc.; 405.
    d. Mon-Eco Industries, Inc.; 44-05.
    e. Pittsburgh Corning Corporation; Pittseal 444.

f. Vimasco Corporation; 750.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Products, Division of ITW; CP-76.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Johns Manville; Zeston.
b. P.I.C. Plastics, Inc.; FG Series.
c. Proto PVC Corporation; LoSmoke.
d. Speedline Corporation; SmokeSafe.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

C. Underground Direct-Buried Jacket: 125-mil- thick vapor barrier and waterproofing membrane consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Pittsburgh Corning Corporation; Pittwrap.
b. Polyguard; Insulrap No Torch 125.

2.6 TAPES

A. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0555.
b. Compac Corp.; 130.
c. Ideal Tape Co., Inc., an American Biltrite Company; 370 White PVC tape.
d. Venture Tape; 1506 CW NS.

2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

2.7 SECUREMENTS

A. Bands:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Products; Bands.
b. PABCO Metals Corporation; Bands.
c. RPR Products, Inc.; Bands.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 316 304 or Type 316; 0.015 inch thick, 3/4 inch wide with wing seal closed seal wing or closed seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal closed seal wing or closed seal.
4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

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 equipment and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and 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, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom 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 application and finishing.

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. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

M. 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 similar to butt joints.

3.4 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

C. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies with an approved firestopping material.

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.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be 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 preformed fitting insulation or sectional pipe insulation of same material and thickness as 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 preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two 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.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and

unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

3.6 CELLULAR-GLASS INSULATION INSTALLATION

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.

B. Insulation Installation on Pipe Flanges:

1. Install preformed 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 pipe 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 preformed sections of same material as 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 sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed 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 FIELD-APPLIED JACKET INSTALLATION

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.

1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch- thick coats of lagging adhesive.
3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.8 FINISHES

A. Equipment and Pipe Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Sections.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

3.9 FIELD QUALITY CONTROL

A. Inspections:
1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation.

3.10 PIPING INSULATION SCHEDULE, GENERAL

A. 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.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.11 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water:

1. NPS 1 and Smaller: Insulation shall be the following:

a. Cellular Glass: 1-1/2 inches thick.

2. NPS 1-1/4 and Larger: Insulation shall be the following:

a. Cellular Glass: 1-1/2 inches thick.

B. Domestic Hot and Recirculated Hot Water:

1. NPS 1-1/4 and Smaller: Insulation shall be the following:

a. Cellular Glass: 1-1/2 inches thick.

2. NPS 1-1/2 and Larger: Insulation shall be one of the following:

a. Cellular Glass: 1-1/2 inches thick.

END OF SECTION 22 07 00

SECTION 22 11 16
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Under-building slab and aboveground domestic water pipes, tubes, fittings, and specialties inside the building.
2. Escutcheons.
3. Sleeves and sleeve seals.
4. Wall penetration systems.

1.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Domestic water piping and support and installation shall withstand effects of earthquake motions determined according to ASCE/SEI 7.

1.4 SUBMITTALS

A. Product Data: For the following products:
1. Dielectric fittings.
2. Flexible connectors.
3. Escutcheons.
4. Sleeves and sleeve seals.
5. Wall penetration systems.

B. Coordination Drawings: For piping in equipment rooms and other congested areas, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
1. Domestic water piping.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14 for plastic, potable domestic water piping and components. Include marking "NSF-pw" on piping.

C. Comply with NSF 61 for potable domestic water piping and components.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Architect, Owner and the Owners Representative no fewer than two days in advance of proposed interruption of water service.

1.7 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L and ASTM B 88, Type M water tube, drawn temper.

1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.
2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
3. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
5. Copper Pressure-Seal-Joint 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) Elkhart Products Corporation; Industrial Division.
2) NIBCO INC.
3) Viega; Plumbing and Heating Systems.

b. NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber O-ring seal in each end.

c. NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber O-ring seal in each end.

6. Copper Push-on-Joint 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) NVent LLC.

b. Description: Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22; with stainless-steel teeth and EPDM-rubber O-ring seal in each end instead of solder-joint ends.

2.3 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

B. Dielectric Unions:

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. Capitol Manufacturing Company.
b. Central Plastics Company.
c. EPCO Sales, Inc.
d. Hart Industries International, Inc.
e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
f. Zurn Plumbing Products Group; Wilkins Water Control Products.

2. Description:

a. Pressure Rating: 150 psig 250 psig at 180 deg F.
b. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Couplings:

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. Calpico, Inc.
b. Lochinvar Corporation.

2. Description:

a. Galvanized-steel coupling.
b. Pressure Rating: 300 psig at 225 deg F.
c. End Connections: Female threaded.
d. Lining: Inert and noncorrosive, thermoplastic.

D. Dielectric Nipples:

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. Perfection Corporation; a subsidiary of American Meter Company.
b. Precision Plumbing Products, Inc.
c. Victaulic Company.

2. Description:

a. Electroplated steel nipple complying with ASTM F 1545.
b. Pressure Rating: 300 psig at 225 deg F.
c. End Connections: Male threaded or grooved.
d. Lining: Inert and noncorrosive, propylene.

2.4 ESCUTCHEONS

A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.

B. One Piece, Cast Brass: Polished, chrome-plated or rough-brass finish with setscrews.

C. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

D. Split-Casting Floor Plates: Cast brass with concealed hinge.

2.5 SLEEVES

A. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

B. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc-coated, with plain ends.

C. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with setscrews.

2.6 SLEEVE SEALS

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. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex, Inc.
4. Pipeline Seal and Insulator, Inc.

B. Description: Modular sealing element unit, designed for field assembly, used to fill annular space between pipe and sleeve.

1. Sealing Elements: EPDM-rubber NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, Stainless steel of length required to secure pressure plates to sealing elements.

2.7 WALL PENETRATION SYSTEMS

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. SIGMA.

B. Description: Wall-sleeve assembly, consisting of housing and gland, gaskets, and pipe sleeve.

1. Carrier-Pipe Deflection: Up to 5 percent without leakage.
2. Housing: Ductile-iron casting with hub, waterstop, anchor ring, and locking devices. Include gland, bolts, and nuts.
3. Housing-to-Sleeve Gasket: EPDM rubber NBR.
4. Housing-to-Carrier-Pipe Gasket: AWWA C111, EPDM rubber NBR.
5. Pipe Sleeve: AWWA C151, ductile-iron pipe or ASTM A 53/A 53M, Schedule 40, zinc-coated steel pipe.

2.8 GROUT

A. Standard: ASTM C 1107, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."

C. Install underground copper tube and ductile-iron pipe in PE encasement according to ASTM A 674 or AWWA C105.

D. Install shutoff valve immediately upstream of each dielectric fitting.

E. Install domestic water piping level with 0.25 percent slope downward toward drain without pitch and plumb.

F. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

G. 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.

H. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

I. Install piping to permit valve servicing.

J. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.

K. Install piping free of sags and bends.

L. Install fittings for changes in direction and branch connections.

3.2 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Brazed Joints" Chapter.

E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.

G. Copper-Tubing, Push-on Joints: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.

H. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

I. Copper-Tubing Grooved Joints: Roll groove end of tube. Assemble coupling with housing, gasket, lubricant, and bolts. Join copper tube and grooved-end fittings according to AWWA C606 for roll-grooved joints.

3.3 VALVE INSTALLATION

A. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

B. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

1. Hose-End Drain Valves: At low points in water mains, risers, and branches.
2. Stop-and-Waste Drain Valves: Instead of hose-end drain valves where indicated.

3.4 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Fittings in Underground Domestic Water Piping:

1. NPS 1-1/2 and Smaller: Fitting-type coupling.
2. NPS 2 and Larger: Sleeve-type coupling.

C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.

3.5 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings, nipples or unions.

3.6 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.

1. Vertical Piping: MSS Type 8 or 42, clamps.
2. Individual, Straight, Horizontal Piping Runs:

    a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    c. Longer Than 100 Feet If Indicated: MSS Type 49, spring cushion rolls.

3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
4. NPS 2-1/2: 108 inches with 1/2-inch rod.
5. NPS 3 to NPS: 10 feet with 1/2-inch rod.

E. Install supports for vertical copper tubing every 10 feet.

3.7 ESCUTCHEON INSTALLATION

A. Install escutcheons for penetrations of walls, ceilings, and floors.

B. Escutcheons for New Piping:

1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish stamped steel with set screw.
3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish.
4. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

3.8 SLEEVE INSTALLATION

A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.

B. Sleeves are not required for core-drilled holes.

C. Permanent sleeves are not required for holes formed by removable PE sleeves.

D. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.

E. Install sleeves in new partitions, slabs, and walls as they are built.

F. For interior wall penetrations, seal annular space between sleeve and pipe or pipe insulation using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants" for joint sealants.

G. Seal space outside of sleeves in concrete slabs and walls with grout.

H. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation unless otherwise indicated.

I. Install sleeve materials according to the following applications:

1. Sleeves for Piping Passing through Concrete Floor Slabs: Molded PE, Molded PVC or Steel pipe.

2. Sleeves for Piping Passing through Gypsum-Board Partitions:

a. PVC pipe or Steel pipe sleeves for pipes smaller than NPS 6.
b. Galvanized-steel sheet sleeves for pipes NPS 6 and larger.
c. Exception: Sleeves are not required for water supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.

3. Sleeves for Piping Passing through Interior Concrete Walls:

a. PVC pipe or Steel pipe sleeves for pipes smaller than NPS 6.

J. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

3.9 WALL PENETRATION SYSTEM INSTALLATION

A. Install wall penetration systems in new concrete walls.

B. Assemble wall penetration system components with sleeve pipe. Install so that end of sleeve pipe and face of housing are flush with wall. Adjust locking devices to secure sleeve pipe in housing.

3.10 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Piping Inspections:

1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

    a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Re-inspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for re-inspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

C. Piping Tests:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and for corrective action required.

D. Domestic water piping will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.

    a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide flow of hot water in each branch.
    b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.

3.12 CLEANING

A. Clean and disinfect potable and non-potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.13 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; cast- or wrought-copper solder-joint fittings; and brazed soldered joints.
2. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; copper pressure-seal-joint fittings; and pressure-sealed joints.
3. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; copper push-on-joint fittings; and push-on joints.

E. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; cast- or wrought-copper solder-joint fittings; and brazed soldered joints.
2. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; copper pressure-seal-joint fittings; and pressure-sealed joints.
3. Hard copper tube, ASTM B 88, Type L or ASTM B 88, Type M; grooved-joint copper-tube appurtenances; and grooved joints.

3.14 VALVE SCHEDULE

A. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
2. Hot-Water Circulation Piping, Balancing Duty: Calibrated Memory-stop balancing valves.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION 22 11 16

SECTION 22 11 19

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following domestic water piping specialties:
   1. Strainers.
   2. Water hammer arresters.
   3. Air vents.

1.3 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig, unless otherwise indicated.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

   1. Pressure Rating:125 psig minimum, unless otherwise indicated.
   2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or FDA-approved, epoxy coating and for NPS 2-1/2 and larger.
   3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
   4. Screen: Stainless steel with round perforations, unless otherwise indicated.
   5. Perforation Size:

a. Strainers NPS 2 and Smaller: 0.033 inch.
b. Strainers NPS 2-1/2 to NPS 4: 0.062 inch.

6. Drain: Pipe plug Factory-installed, hose-end drain valve.

2.2 WATER HAMMER ARRESTERS

A. Water Hammer Arresters:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AMTROL, Inc.
b. Josam Company.
c. MIFAB, Inc.
d. PPP Inc.
e. Sioux Chief Manufacturing Company, Inc.
f. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
g. Tyler Pipe; Wade Div.
h. Watts Drainage Products Inc.
i. Zurn Plumbing Products Group; Specification Drainage Operation.

2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Metal bellows Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.3 AIR VENTS

A. Bolted-Construction Automatic Air Vents:

1. Body: Bronze.
2. Pressure Rating: 125-psig minimum pressure rating at 140 deg F.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

B. Welded-Construction Automatic Air Vents:

1. Body: Stainless steel.
2. Pressure Rating: 150-psig minimum pressure rating.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 3/8 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve, and pump.

B. Install water hammer arresters in water piping according to PDI-WH 201.

C. Install air vents at high points of water piping.

END OF SECTION 22 11 19

SECTION 22 13 16

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for soil, waste, and vent piping inside the building:

1. Pipe, tube, and fittings.
2. Special pipe fittings.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. EPDM: Ethylene-propylene-diene terpolymer rubber.

C. LLDPE: Linear, low-density polyethylene plastic.

D. NBR: Acrylonitrile-butadiene rubber.

E. PE: Polyethylene plastic.

F. PVC: Polyvinyl chloride plastic.

G. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:

1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.5 SUBMITTALS

A. Product Data: For pipe, tube, fittings, and couplings.

B. Shop Drawings.

C. Field quality-control inspection and test reports.

1.6 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.

1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.

B. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.

1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

C. Cellular-Core, Sewer and Drain Series, PVC Pipe: ASTM F 891, Series PS 100.

1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Series PS 100 sewer and drain pipe.

D. Solvent Cement and Adhesive Primer:

1. Use PVC solvent cement that has a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.

B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
1. Solid-wall Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.

C. Aboveground, vent piping NPS 4 and smaller shall be any of the following:

1. Solid-wall Cellular-core PVC pipe, PVC socket fittings, and solvent-cemented joints.

3.2 PIPING INSTALLATION

A. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

B. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

C. Install waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

D. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

E. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.

3.3 JOINT CONSTRUCTION

A. PVC Non-pressure Piping Joints: Join piping according to ASTM D 2665.

3.4 HANGER AND SUPPORT INSTALLATION

A. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Install individual, straight, horizontal piping runs according to the following:

a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
b. Longer than 100 Feet: MSS Type 43, adjustable roller hangers.
c. Longer than 100 Feet, if indicated: MSS Type 49, spring cushion rolls.

B. Support vertical piping and tubing at base and at floor.

C. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.

D. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
2. NPS 3: 48 inches with 1/2-inch rod.
3. NPS 4 and 5: 48 inches with 5/8-inch rod.
4. NPS 6: 48 inches with 3/4-inch rod.
5. NPS 8 to NPS 12: 48 inches with 7/8-inch rod.

E. Install supports for vertical ABS and PVC piping every 48 inches.

F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.5 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to the following:

1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code and authorities having jurisdiction.
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by code and authorities having jurisdiction.

3.6 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.7 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 22 13 16

SECTION 22 40 00

PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following conventional plumbing fixtures and related components:

1. Faucets for lavatories, bathtubs, bathtub/showers, showers and sinks.
2. Flushometers.
3. Toilet seats.
4. Protective shielding guards.
5. Fixture supports.
6. Water closets.
7. Urinals.
8. Lavatories.
9. Individual showers.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

C. Cast Polymer: Cast-filled-polymer-plastic material. This material includes cultured-marble and solid-surface materials.

D. Cultured Marble: Cast-filled-polymer-plastic material with surface coating.

E. Fitting: Device that controls the flow of water into or out of the plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.

F. FRP: Fiberglass-reinforced plastic.

G. PMMA: Polymethyl methacrylate (acrylic) plastic.

H. PVC: Polyvinyl chloride plastic.

I. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

1.4 SUBMITTALS

A. Product Data: For each type of plumbing fixture indicated. Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.

B. Operation and Maintenance Data: For plumbing fixtures to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.

1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.

B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.

C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.

D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

F. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
1. Plastic Shower Enclosures: ANSI Z124.2.
2. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
3. Slip-Resistant Bathing Surfaces: ASTM F 462.
4. Vitreous-China Fixtures: ASME A112.19.2M.
5. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.

G. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:
1. Faucets: ASME A112.18.1.

H. Comply with the following applicable standards and other requirements specified for bathtub, bathtub/shower and shower faucets:

1. Faucets: ASME A112.18.1.
2. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.

1.6 WARRANTY

A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures of unit shell.
b. Faulty operation of controls, blowers, pumps, heaters, and timers.
c. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Period for Commercial Applications: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LAVATORY FAUCETS

A. Lavatory Faucets:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. American Standard Companies, Inc.
b. Chicago Faucets.
c. Delta Faucet Company.
d. Kohler Co.

2. Description: Two-handle mixing valve. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.

a. Body Material: Commercial, solid brass or copper or brass underbody with brass cover plate General-duty.
b. Finish: Polished chrome plate.
c. Maximum Flow Rate: 0.5 gpm.
d. Centers: 4 inches Single hole Adjustable.
e. Mounting: Exposed deck.
f. Valve Handle(s): Wrist blade.
g. Inlet(s): NPS 3/8 tubing with NPS 1/2 male adaptor NPS.
h. Spout: Gooseneck type.
i. Spout Outlet: Aerator Spray, 0.5 gpm.
j. Operation: Manual Non-compression.
k. Drain: Pop up Stopper.
l. Tempering Device: Not required.

2.2 SHOWER FAUCETS

A. Shower Faucets:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. American Standard Companies, Inc.
b. Chicago Faucets.
c. Delta Faucet Company.
d. Kohler Co.
e. Leonard Valve Company.
f. Symmons Industries, Inc.
g. Zurn Plumbing Products Group; AquaSpec Commercial Faucet Operation.

2. Description: Single-handle pressure-balance thermostatic valve. Include hot- and cold-water indicators; check stops; and shower head, arm, and flange. Coordinate faucet inlets with supplies and outlet with diverter valve.

a. Body Material: Solid brass with nonmetallic trim.
b. Finish: Polished chrome.
c. Maximum Flow Rate: 2.0 gpm, unless otherwise indicated.
d. Diverter Valve: Not required.
e. Mounting: Exposed.
f. Backflow Protection Device for Hand-Held Shower: Required.
g. Operation: Manual Non-compression.
h. Antiscald Device: Not required.
i. Check Stops: Check-valve type, integral with or attached to body; on hot- and cold-water supply connections.
j. Supply Connections: NPS 1/2 union, Sweat.
k. Shower Head Type: Ball joint and head integral with mounting flange.
l. Shower Head Material: nonmetallic with chrome-plated finish.
m. Spray Pattern: Fixed.
n. Integral Volume Control: Not required.
o. Shower-Arm Flow-Control Fitting: 2.0 gpm
p. Temperature Indicator: Integral with faucet.

2.3 FLUSHOMETERS

A. Flushometers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
a. Delta Faucet Company.
b. Sloan Valve Company.
c. Zurn Plumbing Products Group; Commercial Brass Operation.

2. Description: Flushometer for urinal water-closet-type fixture. Include brass body with corrosion-resistant internal components, non-hold-open feature, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.

a. Internal Design: Diaphragm or piston operation.
b. Style: Exposed.
c. Inlet Size: NPS 1.
d. Trip Mechanism: Oscillating, lever-handle actuator Mechanical.
e. Consumption: 1.0 gal./flush.
f. Tailpiece Size: NPS 1-1/4 and standard length to top of bowl.

2.4 TOILET SEATS

A. Toilet Seats:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. American Standard Companies, Inc.
b. Kohler Co.
c. Olsonite Corp.

2. Description: Toilet seat for water-closet-type fixture.

a. Material: Molded, solid plastic with antimicrobial agent.
b. Configuration: Open front without cover.
c. Size: Elongated.
d. Hinge Type: self-sustaining SC.
e. Class: Heavy-duty commercial.
f. Color: Black.

2.5 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Engineered Brass Co.
b. TRUEBRO, Inc.
c. Zurn Plumbing Products Group; Tubular Brass Plumbing Products Operation.

2. Description: Manufactured plastic wraps for covering plumbing fixture hot-water supply hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

B. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. TRUEBRO, Inc.

2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

2.6 FIXTURE SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Josam Company.
2. MIFAB Manufacturing Inc.
3. Smith, Jay R. Mfg. Co.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
6. Zurn Plumbing Products Group; Specification Drainage Operation.

B. Urinal Supports:

1. Description: Urinal carrier with hanger and bearing plates for wall-mounting, urinal-type fixture.

C. Lavatory Supports:

1. Description: Lavatory carrier with hanger plate and tie rod for wall-mounting, lavatory-type fixture.

2.8 WATER CLOSETS

D. Water Closets:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. American Standard Companies, Inc.
b. Kohler Co.
c. Peerless Pottery, Inc.
d. Sanitarios Azteca, S.A. de C.V.
e. Sterling Plumbing Group, Inc.

2. Description: Floor-mounted, tank, flushometer valve operation.

a. Supply: NPS 1” chrome-plated brass or copper with wheel-handle screwdriver loose-key stop.
b. Style: Flushometer valve.

1) Bowl Type: Elongated reverse-trap blowout siphon-vortex siphon-wash. Include bolt caps matching fixture.
2) Height: Accessible.
3) Design Consumption: 1.6 gal./flush.
4) Color: White.

2.7 URINALS

A. Urinals:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

    a. American Standard Companies, Inc.
    b. Crane Plumbing, L.L.C./Fiat Products.
    c. Kohler Co.

2. Description: Accessible wall-mounting vitreous-china fixture designed for flushometer valve operation.

    a. Type: Washout with extended shields.
    b. Strainer or Trapway: Separate removable strainer with integral trap.
    c. Design Consumption: 1 gal./flush.
    d. Color: White.
    e. Supply Spud Size: NPS 1.
    f. Outlet Size: NPS 2.
    g. Flushometer: Hand lever.
    h. Fixture Support: Wall type carrier.

2.8 LAVATORIES

A. Lavatories:
1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

    a. American Standard Companies, Inc.
    b. Commercial Enameling Company.
    c. Kohler Co.
    d. Crane Plumbing, L.L.C./Fiat Products.

2. Description: Accessible, Wall, vitreous-china fixture.

    a. Type: With back Ledge.
    b. Size: 20 by 18 inches rectangular.
    c. Faucet Hole Punching: Three holes, 4-inch centers.
    d. Faucet Hole Location: Top.
    e. Pedestal: Not required.
    f. Color: White.
    g. Faucet: Lavatory with pop-up waste for separate drain.
    h. Supplies: NPS 3/8 chrome-plated copper with stops.
    i. Drain: See faucet.

        1) Location: back of bowl.

    j. Drain Piping: NPS 2” chrome-plated, cast-brass P-trap; 0.045-inch- thick tubular brass waste to wall and wall escutcheon.
    k. Fixture Support: Lavatory.

2.9 INDIVIDUAL SHOWERS

A. Individual Showers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

a. Aqua Glass Corporation.
b. LASCO Bathware.
c. Swan Corporation (The).
d. Acryline USA, Inc.
e. Aqua Bath Company, Inc.
f. Aquatic Industries, Inc.
g. Kohler Co.

2. Description: Accessible, FRP PMMA shower enclosure with slip-resistant bathing surface and shower rod with curtain.

a. Size: 40.25” x 38.5” x 77.5”.
b. Surround: One piece or sealed.
c. Color: White.
d. Drain Location: Center.
e. Accessibility Options: Include grab bar and seat, comply with ADA
f. Faucet: Shower.
g. Drain: Grid, NPS 2.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.

B. Examine floors, and walls for suitable conditions where fixtures will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.

B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.

1. Use carrier supports with waste fitting and seal for back-outlet fixtures.

C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.

D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.

E. Install fixtures level and plumb according to roughing-in drawings.

F. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.

G. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.

H. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

I. Install toilet seats on water closets.

J. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

K. Install shower flow-control fittings with specified maximum flow rates in shower arms.

L. Set shower receptors and service basins in leveling bed of cement grout.

M. Seal joints between fixtures and walls, floors using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.3 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Ground plumbing equipment.

3.4 FIELD QUALITY CONTROL

A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.

B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.5 ADJUSTING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.

C. Replace washers and seals of leaking and dripping faucets and stops.

3.6 CLEANING

A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
2. Remove sediment and debris from drains.

B. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.7 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 40 00

SECTION 23 07 00
HVAC INSULATION

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. Insulation Materials:
    a. Mineral fiber.
2. Adhesives.
3. Mastics.
4. Sealants.
5. Tapes.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, thickness, and jackets (both factory and field applied, if any).

B. Shop Drawings:
1. Detail insulation application at pipe expansion joints for each type of insulation.
2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.

C. Qualification Data: For qualified Installer.

D. 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.

E. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I II with factory-applied vinyl jacket III with factory-applied FSK jacket III with factory-applied FSP jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide the following provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corp.; Duct Wrap.
b. Johns Manville; Microlite.
c. Knauf Insulation; Duct Wrap.
d. Manson Insulation Inc.; Alley Wrap.
e. Owens Corning; All-Service Duct Wrap.

2.2 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. Insulco, Division of MFS, Inc.; Triple I.
b. P. K. Insulation Mfg. Co., Inc.; Super-Stik.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. Childers Products, Division of ITW; CP-82.
b. Foster Products Corporation, H. B. Fuller Company; 85-20.
c. ITW TACC, Division of Illinois Tool Works; S-90/80.
d. Marathon Industries, Inc.; 225.
e. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
b. Compac Corp.; 104 and 105.

c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

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.

B. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.

1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
b. Compac Corp.; 120.
c. Ideal Tape Co., Inc., an American Biltrite Company; 488 AWF.
d. Venture Tape; 3520 CW.

2. Width: 2 inches.
3. Thickness: 3.7 mils.
4. Adhesion: 100 ounces force/inch in width.
5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

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 equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and 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, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

F. Keep insulation materials dry during application and finishing.

G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

H. Install insulation with least number of joints practical.

I. 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 at attachment to structure with vapor-barrier mastic.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

L. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

M. 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 similar to butt joints.

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. 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 Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

3.5 MINERAL-FIBER INSULATION INSTALLATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.6 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.7 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:
1. Indoor, concealed exhaust between isolation damper and penetration of building exterior.

3.8 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed, rectangular, exhaust-air duct insulation between isolation damper and penetration of building exterior shall be one of the following:

1. Flexible Elastomeric: 1 inch thick.
2. Mineral-Fiber Blanket: 1-1/2 inches, 3-lb/cu. ft. nominal density.

END OF SECTION 23 07 00

SECTION 23 31 13
METAL DUCTS

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. Single-wall rectangular ducts and fittings.

1.3 PERFORMANCE REQUIREMENTS

A. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

1.4 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. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
4. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

C. Delegated-Design Submittal:

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.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

PART 2 - PRODUCTS

2.1 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.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) 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."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," 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 according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "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."

2.2 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 shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install ducts 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. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

K. Clean existing ductwork remaining in place.

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 the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
   1. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "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.

C. Hangers Exposed to View: Threaded rod and angle or channel supports.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

   1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
   2. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
   3. Test for leaks before applying external insulation.

4. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.

C. 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 according to "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 shall not exceed 0.75 mg/100 sq. cm.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.6 DUCT CLEANING

A. Clean new and existing duct system(s) before testing, adjusting, and balancing.

B. Use service openings for entry and inspection.

1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Division 23 Section "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.

C. 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.

D. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).

E. 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. Clean existing ducts to remain in place.

3.7 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:

B. Exhaust Ducts:

1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:

a. Pressure Class: Negative 2-inch wg.
b. Minimum SMACNA Seal Class: A for negative pressure.
c. SMACNA Leakage Class for Rectangular: 12.

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "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.

C. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."

a. Rectangular Main to Rectangular Branch: 45-degree entry.

2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "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 23 31 13

SECTION 23 33 00
AIR DUCT ACCESSORIES

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. Backdraft and pressure relief dampers.
2. Manual volume dampers.

1.3 SUBMITTALS

A. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
   a. Manual volume damper installations.

B. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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 shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Exposed-Surface Finish: Mill phosphatized.

C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.

D. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

E. Extruded Aluminum: Comply with ASTM B 22, Alloy 6063, Temper T6.

F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 BACKDRAFT AND PRESSURE RELIEF DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Air Balance Inc.; a division of Mestek, Inc.
2. American Warming and Ventilating; a division of Mestek, Inc.
3. Greenheck Fan Corporation.
4. Nailor Industries Inc.
5. Ruskin Company.
6. SEMCO Incorporated.

B. Description: Gravity balanced.

C. Maximum Air Velocity: 2000 fpm.

D. Maximum System Pressure: 2-inch wg.

E. Frame: 0.063-inch- thick extruded aluminum, with welded corners and mounting flange.

F. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width, 0.025-inch- thick, roll-formed aluminum, 0.050-inch- thick aluminum sheet, noncombustible, tear-resistant, neoprene-coated fiberglass with sealed edges.

G. Blade Action: Parallel.

H. Blade Seals: Neoprene.

I. Blade Axles:

1. Material: Aluminum.
2. Diameter: 0.20 inch.

J. Brackets: Aluminum.

K. Return Spring: Adjustable tension.

L. Bearings: Steel ball or synthetic pivot bushings.

M. Accessories:

1. Adjustment device to permit setting for varying differential static pressure.
2. Counterweights and spring-assist kits for vertical airflow installations.
3. Screen Mounting: Front mounted in sleeve.
    a. Sleeve Thickness: 20-gage minimum.
    b. Sleeve Length: 6 inches minimum.
4. Screen Mounting: Rear mounted.
5. Screen Material: Aluminum.
6. Screen Type: Insect.
7. 90-degree stops.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

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. Air Balance Inc.; a division of Mestek, Inc.
    b. American Warming and Ventilating; a division of Mestek, Inc.
    c. METALAIRE, Inc.
    d. Nailor Industries Inc.
    e. Ruskin Company.
    f. Vent Products Company, Inc.
2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames:
    a. Hat-shaped, galvanized stainless-steel channels, 0.064-inch minimum thickness.
    b. Mitered and welded corners.
    c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
    a. Multiple or single blade.

b. Parallel- or opposed-blade design.
c. Stiffen damper blades for stability.
d. Galvanized, 0.064 inch thick.

6. Blade Axles: Galvanized steel.
7. Bearings:

a. Oil-impregnated bronze Molded synthetic Stainless-steel sleeve.
b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

8. Brackets: Galvanized steel.

B. Standard, Aluminum, Manual Volume Dampers:

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. Air Balance Inc.; a division of Mestek, Inc.
b. American Warming and Ventilating; a division of Mestek, Inc.
c. METALAIRE, Inc.
d. Nailor Industries Inc.
e. Ruskin Company.
f. Vent Products Company, Inc.

2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames: Hat-shaped, 0.10-inch- thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:

a. Multiple or single blade.
b. Parallel- or opposed-blade design.
c. Stiffen damper blades for stability.
d. Roll-Formed Aluminum Blades: 0.10-inch- thick aluminum sheet.
e. Extruded-Aluminum Blades: 0.050-inch- thick extruded aluminum.

6. Blade Axles: Galvanized steel.
7. Bearings:

a. Oil-impregnated bronze, Molded synthetic, stainless-steel sleeve.
b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

8. Brackets: Aluminum.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install backdraft control dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

C. Install volume dampers at points on exhaust systems where branches extend from larger ducts. Coordinate subparagraphs below with Division 23 Section "Metal Ducts."

1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

D. Set dampers to fully open position before testing, adjusting, and balancing.

E. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
1. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.

F. Install access doors with swing against duct static pressure.

G. Access Door Sizes:
1. Two-Hand Access: 12 by 6 inches.

H. Install flexible connectors to connect ducts to equipment.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.

END OF SECTION 23 33 00

SECTION 23 34 23
HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Centrifugal roof ventilators.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on actual Project site elevations.

B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

   1. Certified fan performance curves with system operating conditions indicated.
   2. Certified fan sound-power ratings.
   3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
   4. Material thickness and finishes, including color charts.
   5. Dampers, including housings, linkages, and operators.
   6. Roof curbs.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

   1. Wiring Diagrams: Power, signal, and control wiring.
   2. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

D. UL Standard: Power ventilators shall comply with UL 705.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.

B. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

A. Coordinate installation of roof curbs on existing openings with roof curbs.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
1. Greenheck.
2. Loren Cook Company.
3. NuTone Inc.
4. Penn Ventilation.

B. Description: Direct- or belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

C. Housing: Removable, mushroom-domed top; square, one-piece, aluminum base with venturi inlet cone.
1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.

D. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

E. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:

1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
3. Pulleys: Cast-iron, adjustable-pitch motor pulley.
4. Fan and motor isolated from exhaust airstream.

F. Accessories:
1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.
2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
3. Dampers: Counterbalanced backdraft dampers mounted in curb base; factory set to close when fan stops.

G. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.

1. Configuration: Built-in raised cant and mounting flange adjustable to fit on existing curbs.
2. Overall Height: 16 inches.
3. Sound Curb: Curb with sound-absorbing insulation matrix.
4. Pitch Mounting: None.
5. Metal Liner: Galvanized steel.
6. Mounting Pedestal: Galvanized steel with removable access panel.

H. Capacities and Characteristics: See Mechanical Drawings.

2.2 MOTORS

A. Enclosure Type: Totally enclosed, fan cooled.

2.3 SOURCE QUALITY CONTROL

A. Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install power ventilators level and plumb.

B. Secure roof-mounting fans to roof curbs with cadmium-plated hardware.

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors.

B. Install ducts adjacent to power ventilators to allow service and maintenance.

3.3 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Verify that shipping, blocking, and bracing are removed.
2. 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.
3. Verify that cleaning and adjusting are complete.
4. 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.
5. Adjust belt tension.
6. Adjust damper linkages for proper damper operation.
7. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Replace fan and motor pulleys as required to achieve design airflow.

D. Lubricate bearings.

END OF SECTION 23 34 23

SECTION 23 37 13

DIFFUSERS, 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. Fixed face registers and grilles.

B. Related Sections:
   1. Division 23 Section "Air Duct Accessories" for and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

   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. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

PART 2 - PRODUCTS

2.1 REGISTERS AND GRILLES

A. Fixed Bar Register:

   1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
      a. METALAIRE, Inc.
      b. Price Industries.
      c. Titus.

   2. Material: Aluminum.
   3. Finish: White baked enamel.
   4. Face Blade Arrangement: Horizontal 3/4 inch apart.
   5. Core Construction: Integral.
   6. Frame: 1 inch wide.

7. Mounting Frame: Duct.
8. Mounting: Countersunk screw.
9. Damper Type: N/A.

B. Fixed Face Grille:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Price Industries.
   b. Titus.

2. Material: Aluminum.
3. Finish: White baked enamel.
4. Face Arrangement: 1/2-by-1/2-by-1/2-inch grid.
5. Core Construction: Integral.
6. Frame: 1 inch wide.
7. Mounting Frame: Duct.
8. Mounting: Countersunk screw.

2.2 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, 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 are to be 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 diffusers, registers, and grilles level and plumb.

B. Install 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 diffusers grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

SECTION 26 00 05

BASIC ELECTRICAL MATERIALS AND METHODS

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. Existing work
2. Grounding and bonding
3. Connection of utilization equipment
4. Supports
5. Identification
6. Conduit and fittings
7. Electrical boxes
8. Wire and cable
9. Electrical tape
10. Terminations
11. Wiring devices
12. Firestopping

1.3 REFERENCES

A. Conform to requirements of National Electrical Code (NEC) ANSI-C1/NFPA 70-2010.

1.4 COORDINATION

A. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other sections to determine connection locations and requirements.

B. Sequence rough-in of electrical connections to coordinate with installation and start up of equipment furnished under other sections.

PART 2 - PRODUCTS

2.1 BASIC MATERIALS

A. Steel Channel: Galvanized or painted steel.

B. Anchors:

1. Masonry Anchors: Rawl-Stud, Lok-Bolt, Saber-Tooth, or equal by Arro, Diamond, or Redhead.
2. Hollow-Wall Anchors: Toggle bolt by Rawl or equal by Arro, Diamond, or Redhead.
3. Anchors shall have sufficient holding power for intended use.
4. Plastic anchors and powder actuated anchors are not permitted.

C. Miscellaneous Hardware: Treat for corrosion resistance.

2.2 METAL CONDUIT

A. Acceptable Manufacturers:

1. Allied Tube and Conduit
2. Wheatland Tube Company
3. Jones and Laughlin
4. Republic Steel
5. Triangle PWC

B. Conduit:

1. Metal Conduit and Tubing: Hot dipped galvanized or sheradized steel.
2. Flexible Conduit: Galvanized steel.
3. Liquidtight Flexible Metallic Conduit: Flexible conduit with PVC jacket.

2.3 PLASTIC CONDUIT

A. Acceptable Manufacturers:

1. Carlon
2. National
3. American Pipe & Plastics, Inc.

B. Plastic Conduit:

1. Plastic Conduit: NEMA TC 2; PVC. Use Schedule 40 conduit.

2.4 FITTINGS

A. Manufacturers:

1. Appleton
2. Bridgeport
3. O-Z/Gedney
4. Raco
5. Steel City
6. Thomas and Betts
7. Carlon
8. American Pipe & Plastics, Inc.

B. Conduit Fittings:

1. Metal Fittings and Conduit Bodies: NEMA FB 1.
2. Plastic Fittings and Conduit Bodies: NEMA TC 3.
3. Fittings and Conduit Bodies for RSC: Galvanized steel or malleable iron, couplings and fittings threaded.
4. Fittings for EMT: Watertight compression or set screw type as appropriate for the application.
5. Conduit Bodies for EMT: Cast aluminum, galvanized iron or malleable iron bodies.
6. Insulated Bushings: Appleton "BBU".
7. Grounding Bushings: O-Z/Gedney "BLG".
8. Conduit Sealing Bushings: OZ Gedney Type CSB, or approved equal.
9. Fittings for Liquidtight Flexible Metallic Conduit: Galvanized steel or malleable iron, couplings and fittings threaded.
10. Conduit Clamps: Galvanized malleable iron equivalent to O-Z/Gedney 14-G and 15-G Series with clamp back spacer for RSC, and single hole #15-75G malleable or #15-75S galvanized steel clips for EMT.

2.5 ELECTRICAL BOXES

A. Manufacturers:

1. Appleton
2. Crouse Hinds
3. Hoffman
4. Killark
5. Lee Products
6. Raco
7. Square D
8. Steel City

B. Boxes:

1. Sheet Metal: NEMA OS 1; galvanized steel, 4" x 4" x 2" with raised plaster ring and non-gangable 3" H x 3 1/2" D x 2" W per section masonry boxes. Gangable or sectionalizing boxes are not permitted.
2. Cast Metal: Aluminum or cast alloy, deep type "FD", gasket cover, threaded hubs, "Bell" boxes not permitted.

C. Mounting Brackets and Adjustable Ceiling Channels: Galvanized steel of substantial construction to support boxes by bridging between hollow wall studs or ceiling channels, like Caddy #SGB24 screw gun bracket, Caddy #H4 mounting bracket, and B-Line #BA-12 box hanger, or approved equal.

D. Hinged Cover Enclosures: NEMA 250, Type 1, steel enclosure with manufacturer's standard enamel finish and continuous hinge cover, held closed by flush latch operable by screwdriver.

2.6 WIRE AND CABLE

A. Manufacturers:

1. Anaconda
2. Rome Cable
3. General Cable
4. Okonite
5. Phelps Dodge Cable
6. Southwire
7. Triangle PWC

B. Building Wire:

1. Feeders and Branch Circuits 6 AWG and Smaller: Annealed copper conductor, 600 volt insulation, THHN/THWN or XHHW, stranded conductor; use compression set terminals.
2. Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

C. Metal Clad Cable:

1. Metal Clad Cable, Size 12 through 10 AWG: Interlocked galvanized steel armor, stranded annealed copper conductor, 600 volt insulation, rated 60E C, with separate green ground wire, NEC Type MC.

2.7 TAPE AND TERMINATIONS

A. Manufacturers, Tape:

1. 3M Co., Scotch #33 and #88

B. Manufacturers, Terminations:

1. Dossert
2. Ideal
3. 3M Co.
4. Thomas and Betts

C. Wire Connection Devices/Terminations: Compression set or twist-on type with integral molded insulation and internal metallic compression ring or spiral screw-on connecting device. Twist-on type shall be like Ideal "Wing Nut" series. Push-on type wire terminals are not acceptable.

D. Wire Terminals, Butt Splices: Crimp set with integral insulated sleeve, electro tin plated, fully annealed copper.

2.8 WIRING DEVICES AND WALL PLATES

A. Manufacturers:

1. Bryant
2. Hubbell
3. Arrow-Hart
4. Pass and Seymour
5. General Electric
6. Leviton

B. Wall Switch: AC general use, specification grade, quiet operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, white color, Hubbell Model 1221.

C. Receptacle:

1. Provide straight blade receptacles to NEMA WD 1.
2. Provide locking blade receptacles to NEMA WD 5.
3. Convenience Receptacle Configuration, general use: Type 5-20 R, specification grade, plastic face, white color, Bryant Model 5352.
4. GFCI Receptacle, general use: Specification grade duplex convenience receptacle with integral ground fault current interrupter, white color, Bryant Model GFR53FT.
5. Isolated Ground Receptacle: Specification grade back and side wired, orange face, Bryant Model 5262-IG.
6. Specific Purpose Receptacle: Configuration indicated on drawings with ivory nylon face.

D. Decorative Cover Plate: White color, smooth rigid nylon or high impact plastic.

E. Weatherproof Covers: Die cast aluminum, gasketed, duplex receptacle cover, weatherproof when attachment plug is inserted.

2.9 FIRESTOPPING MATERIALS

A. Use only through-penetration firestop products that have been tested for specific fire resistance rated conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire rating required for the application:
1. Latex Sealants: Single component latex formulations that when cured do not re-emulsify during exposure to moisture.
2. Firestop Devices: Factory assembles steel collars lined with intumescent material sized to fit a specific outside diameter of penetrating item.
3. Firestop Putty: Intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers or silicone compounds.
4. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film.
5. Firestop Pillows: Re-useable, non-curing, mineral fiber core encapsulated with an intumescent coating contained in a flame retardant poly bag.
6. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or non-sag) or vertical surface (non-sag).
7. Silicone Foam: Multi-component, silicone based, liquid elastomers that when mixed expand and cure in place to produce a flexible, non-shrinking foam.

B. Firestop systems shall be UL classified and rated for the type of construction where it is applied.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that the interior of the building has been physically protected from weather.

B. Verify that supporting surfaces are ready to receive work.

C. Electrical boxes are shown on drawings, locations are approximate unless dimensioned.

D. Make electrical connections to utilization equipment in accordance with equipment manufacturer's instructions.

1. Verify that wiring and outlet rough-in work is complete and that utilization equipment is ready for electrical connection, wiring, and energization.
2. Make wiring connections in control panel or in wiring compartment of prewired equipment. Provide interconnecting wiring where indicated.

3.2 GROUNDING

A. Maintain isolation between neutral and ground conductors in accordance with NEC.

B. Install grounding system so all conductive materials operate at ground potential and there is a low impedance path to ground in the event of a fault.

C. Test grounding system for resistance to earth using fall-to-potential method in accordance with IEEE Std. 81. Maximum ground to earth resistance shall not exceed 25 ohms.

3.3 SUPPORT SYSTEMS

A. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.

1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors, beam clamps, and spring steel clips as appropriate for the application.
2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
3. Do not fasten supports to piping, ceiling support wires, ductwork, mechanical equipment, or conduit.
4. Do not use powder actuated anchors.
5. Do not drill structural wood or steel members.

3.4 CONDUIT

A. Size raceways for conductor type installed or for type THW conductors, whichever is larger.

1. Minimum Size Conduit: 3/4".

B. Install all conduits concealed in walls or above finished ceilings except where specifically indicated to be surface mounted. Arrange conduit to maintain headroom and to present neat appearance. Install conduit in accordance with the following:

1. Route exposed raceway parallel and perpendicular to walls and adjacent piping.
2. Maintain minimum 6" clearance to piping and 12" clearance from parallel runs of flues, steam pipes, and heating appliances. Install horizontal raceway runs above water piping.
3. Complete raceway installation before installing conductors.
4. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings. Where indicated on drawings, sleeve penetrations through concrete walls, floors, and ceilings.
5. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof with pitch pocket.
6. Group in parallel runs where practical and install on steel channel support system. Maintain spacing between raceways or derate circuit ampacities to NFPA 70 requirements.
7. Use conduit hangers and clamps; do not fasten with wire or perforated pipe straps.
8. Use conduit bodies to make sharp changes in direction.
9. Terminate conduit stubs and box connections with insulated bushings.
10. Steel conduit joints shall be threaded; clamp on or set screw fittings are not permitted.
11. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
12. Provide No. 12 AWG insulated conductor or suitable pull string in empty raceways, except sleeves and nipples.
13. Install expansion joints where raceway crosses building expansion joints, and where necessary to compensate for thermal expansion.
14. Install plastic conduit and tubing in accordance with manufacturer's instructions; thermoweld or cement PVC joints.
15. Use flexible or liquidtight conduit, short as possible, maximum 72 inches, for motor and equipment hookup; always include a separate green ground wire.
16. Use liquidtight conduit for flexible connections in damp or wet locations.
17. Install conduit so condensation will drain and not be trapped.
18. Prevent lodgement of dirt, trash, and mortar; swab all raceways prior to installation of wire and cable.
19. Paint surface mounted conduit the color of the surface being mounted too.

3.5 BOXES

A. General:

1. Install electrical boxes where shown on the drawings, and as required for splices, taps, wire pulling, equipment connections, and regulatory requirements.
2. Locate and install electrical boxes to maintain headroom and to present neat mechanical appearance.
3. Align wall mounted outlet boxes for switches, thermostats, and similar devices.
4. Coordinate mounting heights and locations of outlets above counters, benches, and back splashes.
5. Install lighting outlets to locate luminaires as shown on electrical plan.

6. Use expansion anchors, shields, or toggle bolts to fasten boxes in place. Do not use explosive powder driven anchors, except where specifically permitted by Engineer. Do not use nails or wire for permanent support.
7. Secure boxes to interior wall and partition studs, accurately positioned to allow for surface finish thickness; select raised cover depth to assure proper fit.
8. Do not install boxes back-to-back in walls; provide 6" separation, minimum; except provide 24" separation, minimum in acoustic rated walls.
9. Use hinged cover enclosure for interior pull and junction boxes larger than 12 inches in any dimension. Install in an accessible location that will allow easy access.
10. Field punch openings in pull boxes using punch/dies of appropriate size. Provide knockout closures for unused openings.

B. Surface mounted applications:

1. Use cast "FD" outlet boxes for all surface mounted applications to 10 feet above finished floor, and for exterior and wet locations.
2. Where pull boxes must be installed in finished areas, consult Engineer to select location, style, and finish. The location shall always be as inconspicuous as possible.

C. Concealed above ceilings:

1. Install 4" x 4" x 2" or larger steel boxes for general wiring.
2. Octagon boxes, 3 ½" or 4" by 1 ½" or larger depth, are permitted for flush mounted lighting fixture outlets, use adjustable steel channel fasteners for support.
3. Locate and install electrical boxes to allow access. Provide access panels where required for practical access, and as required by the NEC.

D. Concealed in GWB or plaster walls:

1. Install 4" x 4" x 2" steel box; select raised plaster ring and set box so that outer edge is not less than 1/8" below finished wall surface.
2. Use stamped steel mounting bracket for flush outlet/device boxes in hollow stud wall.
3. Align wall mounted outlet boxes for switches, thermostats, and similar devices.
4. Coordinate mounting heights and locations of outlets above counters, benches, and back splashes.

3.6 INSTALLATION OF WIRES AND CABLES

A. Verify that interior of building has been physically protected from weather, that mechanical work which is likely to injure conductors has been completed and completely and thoroughly swab raceway system before installing conductors.

B. Use wire not smaller than 12 AWG for power and lighting circuits, and not smaller than 14 AWG for control wiring.

1. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet; and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

C. Neatly train and secure wiring inside boxes, equipment, and panelboards.

D. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.

E. Install wiring according to the Wiring Standard. Protect and support exposed cables (where allowed) above accessible ceilings to keep them from resting on ceiling tiles. Use channel, or running boards as necessary to provide support. Do not support wiring on ceiling support wires, unless ceiling installer has provided certification that ceiling support system is rated to carry the additional load of the cables. Install cables to run parallel and perpendicular to building lines; do not run diagonally, leave ample slack cable at turns.

F. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.

G. Terminate spare conductors with electrical tape.

H. Color code all service, feeder, branch, control, and signalling circuit conductors. Color shall be green for grounding conductors and white for neutrals, except where neutrals of more than one system are installed in same raceway or box, the other neutral shall be white with a colored (not green) stripe. Color code ungrounded conductors operating at 120 volts to ground black, red, and blue for Phases A, B, and C and at 277 volts, brown, orange, and yellow respectively.

I. Terminate all wire joints #10 AWG or smaller with crimp set or twist-on wire terminating device. Use crimp set or bolted "Burndy" or suitable alternate bolted or crimp set device for conductors larger than #10 AWG.

J. Cover all joints made with non-insulated connecting devices with electrical tape; use Type #88 at any time or #33 whenever the temperature of the joint or the room. Triple wrap joints, each wrap having a 50% overlay.

3.7 DEVICES

A. Install wiring devices in accordance with manufacturer's instructions.

1. Install wall switches 48" above floor, OFF position down.
2. Install wall dimmers 48" above floor. Derate ganged dimmers as instructed by manufacturer. Do not use common neutral.
3. Install convenience receptacles 18" above floor, 6" above counters and backsplash or as indicated, with grounding pole on top.
4. Install cord and attachment plug caps on equipment. Size cord for connected load and rating of branch circuit overcurrent protection.

3.8 FIRESTOPPING

A. Install through penetration firestop systems in accordance with firestop system manufacturer’s written installation instructions for products and applications indicated.

B. Engage an experienced installer who is trained, certified, licensed, or otherwise qualified by the firestop system manufacturer to install the firestop products.

C. Coordinate construction of openings and penetrating items to ensure that firestop systems are installed according to specified requirements.

D. Provide firestop systems that are compatible with one another, with the substrates forming openings, with the items penetrating the firestop system, and under the conditions of service for the application being considered.

E. Provide components for each firestop system that are needed to install fill materials. Use only components specified by the firestop system manufacturer and approved by the qualified testing agency for the designated system.

F. Keep areas of work accessible until inspection by the AHJ has been completed.

G. Inspecting Agency: Owner may engage a qualified independent inspecting agency to inspect the completed firestop system. The independent agency shall comply with ASTM E 2174 requirements including inspecting personnel qualifications, method of conducting inspections, and preparation of test reports.

H. Where deficiencies are found, repair or replace the firestop systems so that they comply with requirements. Proceed with enclosing firestop systems with other construction only after inspection reports are issued and the firestop installations comply with requirements.

I. Protect the firestop system during and after installation to insure that the systems do not deteriorate and are not damaged during the remaining period of construction. In the event damage or deterioration occurs, remove affected firestop system and replace with new materials in compliance with this specification.

3.9 IDENTIFICATION

A. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as scheduled.

1. Degrease and clean surfaces to receive nameplates and tape labels.
2. Secure nameplates to equipment fronts using screws, rivets, or adhesive, with edges parallel to equipment lines. Secure nameplate to inside face of recessed panelboard doors in finished locations.
3. Use embossed tape nameplates with 3/16" lettering to identify individual switches and circuit breakers, wall switches, receptacle circuits, and loads served.
4. Use lamicoid nameplates with minimum 1/4" lettering to identify distribution and control equipment.
5. Nameplate information shall suitably identify the device or circuit. Any nameplate that is not suitably descriptive in the opinion of the Engineer shall be replaced as directed.

B. Install wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connections.

1. Use branch circuit or feeder number to identify power and lighting circuits.
2. Use control wire number as indicated on schematic and interconnection diagrams and equipment manufacturer's shop drawings to identify control wiring.

3.10 FIELD QUALITY CONTROL

A. Perform field inspection and testing of wiring as follows:

1. Inspect wire and cables for physical damage and proper connection.
2. Torque test conductor connections and terminations to manufacturer's recommended values.
3. Verify proper phasing connections; check rotation of all motors.

B. Perform field inspection and testing of devices as follows:
1. Test for proper polarity and ground continuity.
2. Test GFCI operation according to manufacturer’s written instructions.
3. Replace defective units and retest.

END OF SECTION 26 00 05

CITY OF AUBURN, MAINE

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Bid Documents

October 28, 2016

APPENDIX B

CONSTRUCTION DRAWINGS

CITY OF AUBURN, MAINE

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine
Bid No. 2017-008

Issued for Bid

October 28, 2016

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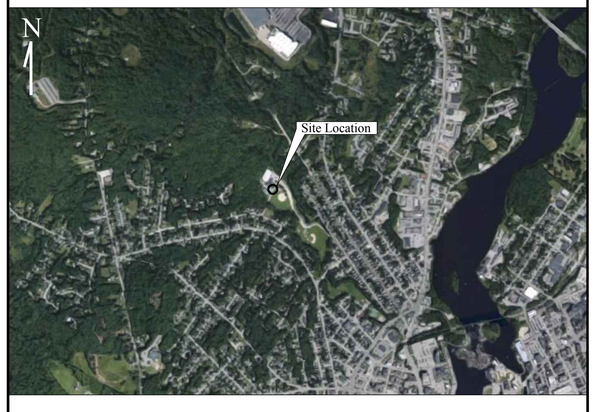
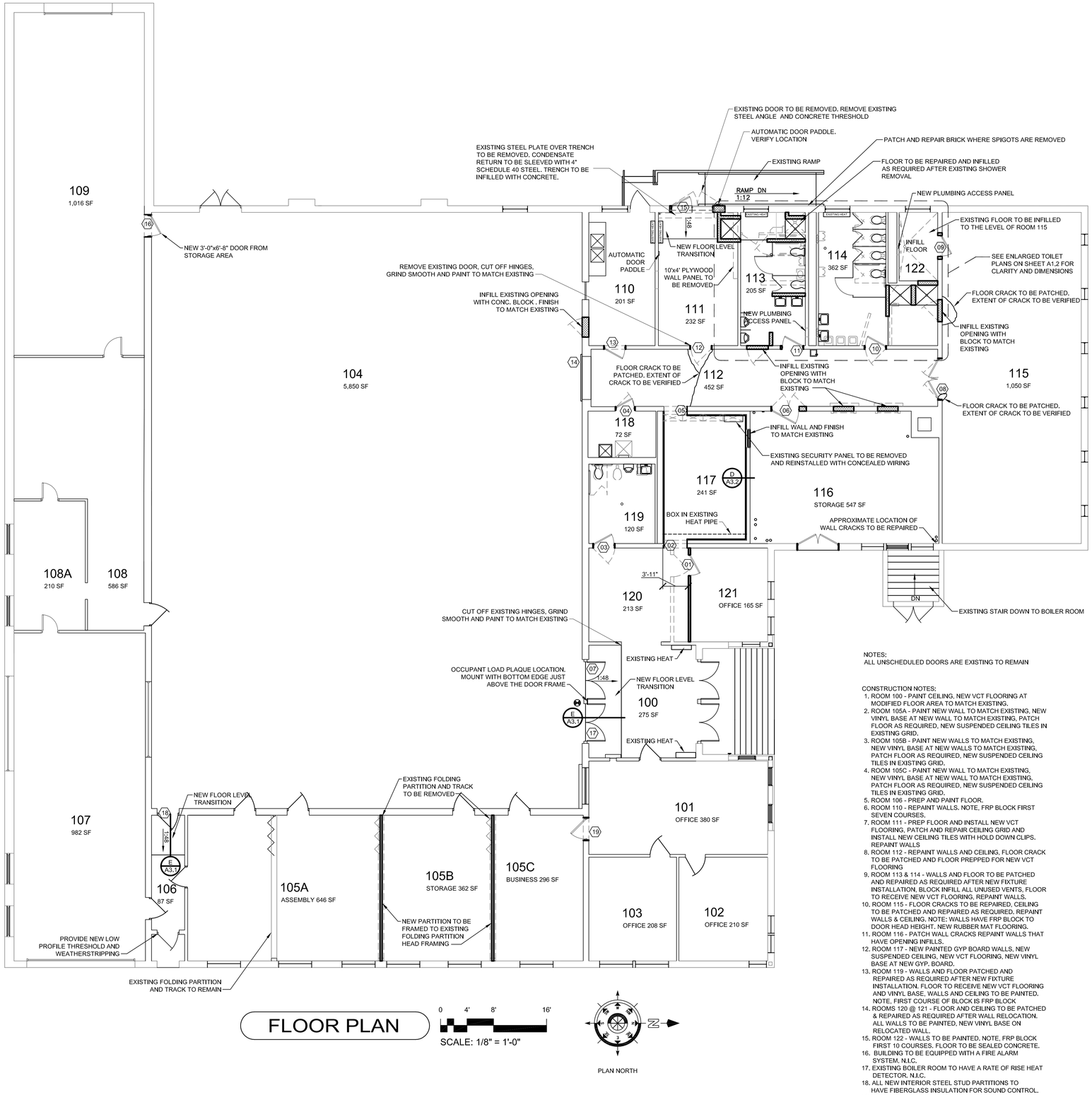
Drawing List

Location Map

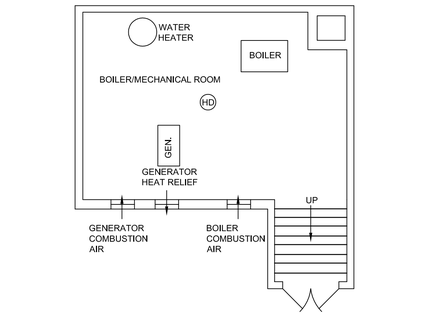
No Scale





FLOOR PLAN

SCALE: 1/8" = 1'-0"



FLOOR PLAN

BOILER ROOM

SCALE: 1/8" = 1'-0"

NOTES:
ALL UNSCHEDULED DOORS ARE EXISTING TO REMAIN

CONSTRUCTION NOTES:
1. ROOM 100 - PAINT CEILING, NEW VCT FLOORING AT MODIFIED FLOOR AREA TO MATCH EXISTING.
2. ROOM 105A - PAINT NEW WALL TO MATCH EXISTING, NEW VINYL BASE AT NEW WALL TO MATCH EXISTING, PATCH FLOOR AS REQUIRED, NEW SUSPENDED CEILING TILES IN EXISTING GRID.
3. ROOM 105B - PAINT NEW WALLS TO MATCH EXISTING, NEW VINYL BASE AT NEW WALLS TO MATCH EXISTING, PATCH FLOOR AS REQUIRED, NEW SUSPENDED CEILING TILES IN EXISTING GRID.
4. ROOM 105C - PAINT NEW WALL TO MATCH EXISTING, NEW VINYL BASE AT NEW WALL TO MATCH EXISTING, PATCH FLOOR AS REQUIRED, NEW SUSPENDED CEILING TILES IN EXISTING GRID.
5. ROOM 106 - PREP AND PAINT FLOOR.
6. ROOM 110 - REPAINT WALLS, NOTE, FRP BLOCK FIRST SEVEN COURSES.
7. ROOM 111 - PREP FLOOR AND INSTALL NEW VCT FLOORING, PATCH AND REPAIR CEILING GRID AND INSTALL NEW CEILING TILES WITH HOLD DOWN CLIPS. REPAINT WALLS
8. ROOM 112 - REPAINT WALLS AND CEILING, FLOOR CRACK TO BE PATCHED AND FLOOR PREPPED FOR NEW VCT FLOORING
9. ROOM 113 & 114 - WALLS AND FLOOR TO BE PATCHED AND REPAIRED AS REQUIRED AFTER NEW FIXTURE INSTALLATION. BLOCK INFILL ALL UNUSED VENTS. FLOOR TO RECEIVE NEW VCT FLOORING, REPAINT WALLS.
10. ROOM 115 - FLOOR CRACKS TO BE REPAIRED, CEILING TO BE PATCHED AND REPAIRED AS REQUIRED, REPAINT WALLS & CEILING. NOTE: WALLS HAVE FRP BLOCK TO DOOR HEAD HEIGHT. NEW RUBBER MAT FLOORING.
11. ROOM 116 - PATCH WALL CRACKS REPAINT WALLS THAT HAVE OPENING INFILLS.
12. ROOM 117 - NEW PAINTED GYP BOARD WALLS, NEW SUSPENDED CEILING, NEW VCT FLOORING, NEW VINYL BASE AT NEW GYP. BOARD.
13. ROOM 119 - WALLS AND FLOOR PATCHED AND REPAIRED AS REQUIRED AFTER NEW FIXTURE INSTALLATION. FLOOR TO RECEIVE NEW VCT FLOORING AND VINYL BASE, WALLS AND CEILING TO BE PAINTED. NOTE, FIRST COURSE OF BLOCK IS FRP BLOCK
14. ROOMS 120 @ 121 - FLOOR AND CEILING TO BE PATCHED & REPAIRED AS REQUIRED AFTER WALL RELOCATION. ALL WALLS TO BE PAINTED, NEW VINYL BASE ON RELOCATED WALL.
15. ROOM 122 - WALLS TO BE PAINTED, NOTE, FRP BLOCK FIRST 10 COURSES. FLOOR TO BE SEALED CONCRETE.
16. BUILDING TO BE EQUIPPED WITH A FIRE ALARM SYSTEM, N.I.C.
17. EXISTING BOILER ROOM TO HAVE A RATE OF RISE HEAT DETECTOR, N.I.C.
18. ALL NEW INTERIOR STEEL STUD PARTITIONS TO HAVE FIBERGLASS INSULATION FOR SOUND CONTROL.
19. PROVIDE A PLAQUE LISTING THE OCCUPANT LOAD OF 990 IN ROOM 100.

GENERAL NOTES

1. GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD
2. THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER IS RESPONSIBLE FOR COORDINATION AND THOROUGH UNDERSTANDING OF ALL DRAWINGS AND SPECIFICATIONS. GENERAL CONTRACTOR OR CONSTRUCTION MANAGER MUST REPORT ALL CONFLICTS BETWEEN SEPARATE ADJACENT TRADES PRIOR TO THE INSTALLATION OF ANY CONFLICTING WORK.
3. ALL GENERAL NOTES APPLY UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
4. INSTALL WORK READILY ACCESSIBLE FOR OPERATION, MAINTENANCE, AND REPAIRS. PROVIDE ACCESS DOORS IN WALLS AND CEILINGS AS NEEDED TO ACCESS CONCEALED ITEMS.
5. COORDINATE STAGING AREAS WITH OWNER AND ARCHITECT AND ANY OTHER CONTRACTORS EMPLOYED BY OWNER PRIOR TO COMMENCEMENT OF WORK.
6. ALL NOTES AND DETAILS MARKED TYPICAL APPLY TO SIMILAR CONDITIONS THROUGHOUT THE PROJECT WHETHER SPECIFICALLY NOTED OR NOT.
7. DRAWINGS ARE PREPARED TO SCALE UNLESS NOTED NTS (NOT TO SCALE)
8. THE CONTRACTOR SHALL FURNISH AND INSTALL ADEQUATE TEMPORARY VERTICAL & LATERAL BRACING AT ALL TIMES DURING CONSTRUCTION UNTIL STRUCTURE IS COMPLETELY TIED TOGETHER.
9. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL BLOCKING NECESSARY TO MOUNT GRAB BARS, TOILET ACCESSORIES, ETC.
10. ALL FRAMING LUMBER SHALL BE NELMA SPF NO. 1 OR APPROVED EQUAL.
11. PROVIDE ALL NECESSARY WOOD FRAMING, BRACING, BLOCKING, NAILERS AND SHIMS REQUIRED TO INSTALL ALL DOORS, WINDOWS, MEP WORK, MILLWORK, MOLDINGS, ACCESSORIES, CABINETS, FIXTURES AND FITTINGS.
12. MAKE MINOR RELOCATIONS OR ADJUSTMENTS AS REQUIRED BY FIELD CONDITIONS. FOR WALL LOCATIONS NOT DIMENSIONED, ADVISE THE ARCHITECT IF LAYOUT LOCATIONS DIFFER FROM THE SCALED LOCATIONS BY MORE THAN 3".
13. PROVIDE TRANSITION STRIPS AT ALL FLOORING TRANSITIONS AND DIFFERING FLOOR MATERIAL THICKNESSES.
14. ASBESTOS HAS BEEN IDENTIFIED IN THE PLUMBING CHASES. THE OWNER HAS CONTRACTED THE ABATEMENT. G.C. TO COORDINATE WITH ABATEMENT CONTRACTOR.
15. GENERAL CONTRACTOR TO BE RESPONSIBLE FOR ALL FLOOR PREPARATION FOR NEW FLOOR OR FINISH.
16. FILL ALL HOLES IN BLOCK WALLS AND FLOOR. FINISH TO MATCH EXISTING.
17. FRP BLOCK TO BE PAINTED WITH SHERWIN WILLIAMS EXTREME BOND PRIMER AND PRE-CATALYZED WATER BASED EPOXY.

Project:

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Client:

City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

- EXISTING WALL TO REMAIN
- NEW WALL - STEEL STUD WALL WITH 5/8" GYP. BOARD
- NEW WALL - MASONRY WALL INFILL TO MATCH EXISTING - NON INFILL TO BE 6" CONC. BLOCK

REGISTERED ARCHITECT JOHN E. HANSEN 14119 STATE OF MAINE

Consultant Name and Address:

ARCHITECT
JOHN E. HANSEN, ARCHITECT
632 SPRUCE HEAD ROAD
SOUTH THOMASTON, MAINE 04858
PHONE: (207) 594 - 5310 FAX: (207) 594 - 5370

Firm Name and Address:

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- ☐ 30% DESIGN DEVELOPMENT
- ☐ 60% DESIGN DEVELOPMENT
- ☐ 90% DESIGN DEVELOPMENT
- ■ 100% BID DOCUMENT
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Sheet Title:

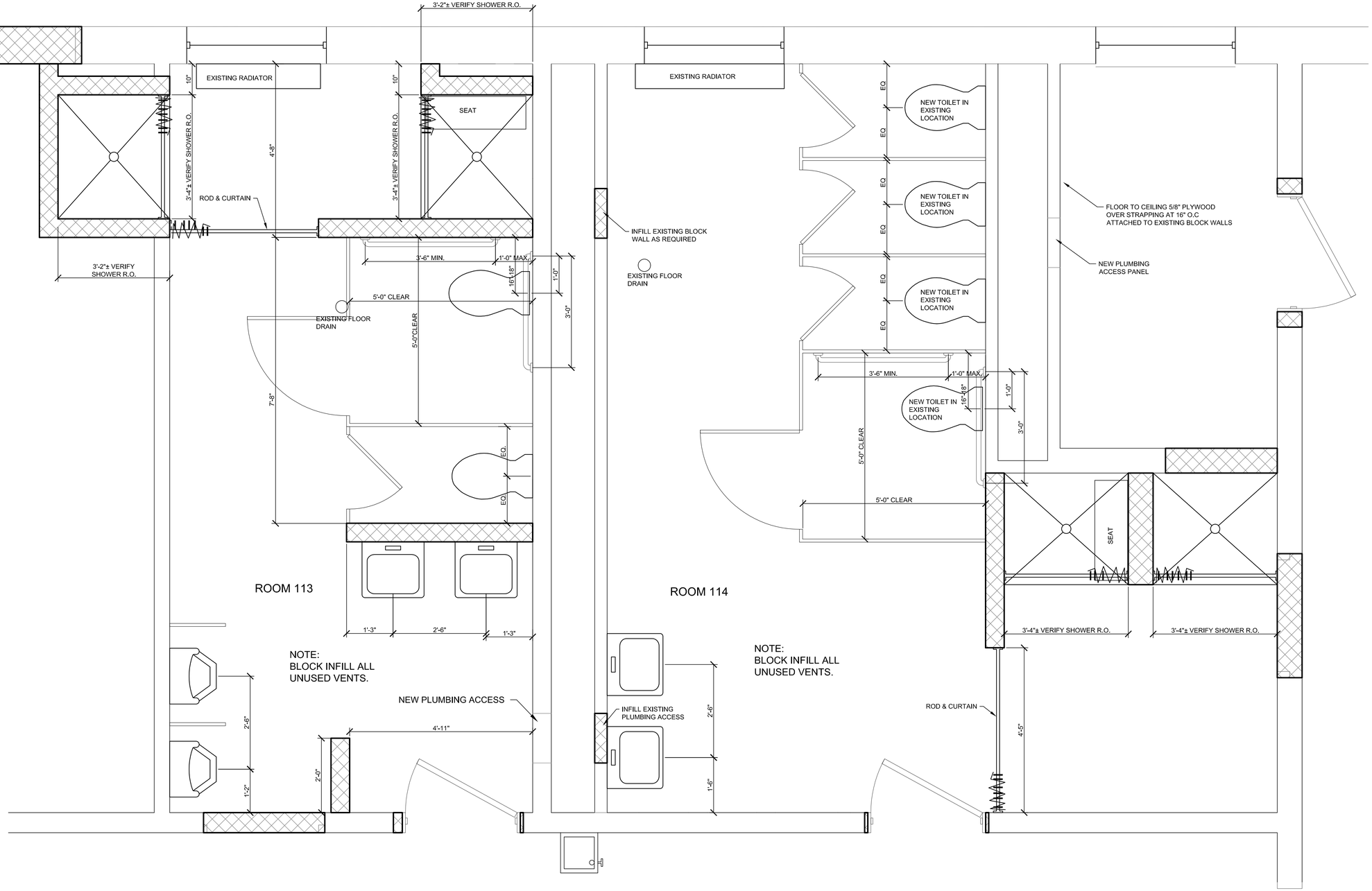
PROPOSED FLOOR PLAN

No.	Revision/Issue	Date

Design by:	Checked by:
JEH	MAD
Drawn by:	**Approved by:**
CMC	BMB
Project	**Date.**
NO. 964	OCTOBER 28, 2016

Sheet Number:

A1.1



ENLARGED TOILET PLANS

0 8" 1'-4" 2'-8"

SCALE: 3/4" = 1'-0"

ELEVATION KEY

Project:

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Client:

City of Auburn, Maine
60 Court Street
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REGISTERED ARCHITECT
JOHN E. HANSEN
STATE OF MAINE

Consultant Name and Address:

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JOHN E. HANSEN, ARCHITECT
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Sheet Title:

ENLARGED TOILET PLANS

No.	Revision/Issue	Date

Design by: JEH	Checked by: MAD
Drawn by: CMC	Approved by: BMB
Project NO. 964	Date. OCTOBER 28, 2016

Sheet Number:

A1.2

COMMON PATH OF TRAVEL: ---------->

ASSEMBLY LESS THAN 50 - 75' PERMITTED - ACTUAL MAX. = 73'-6"

ASSEMBLY 50 OR GREATER - 20' PERMITTED - ACTUAL MAX. = 0'

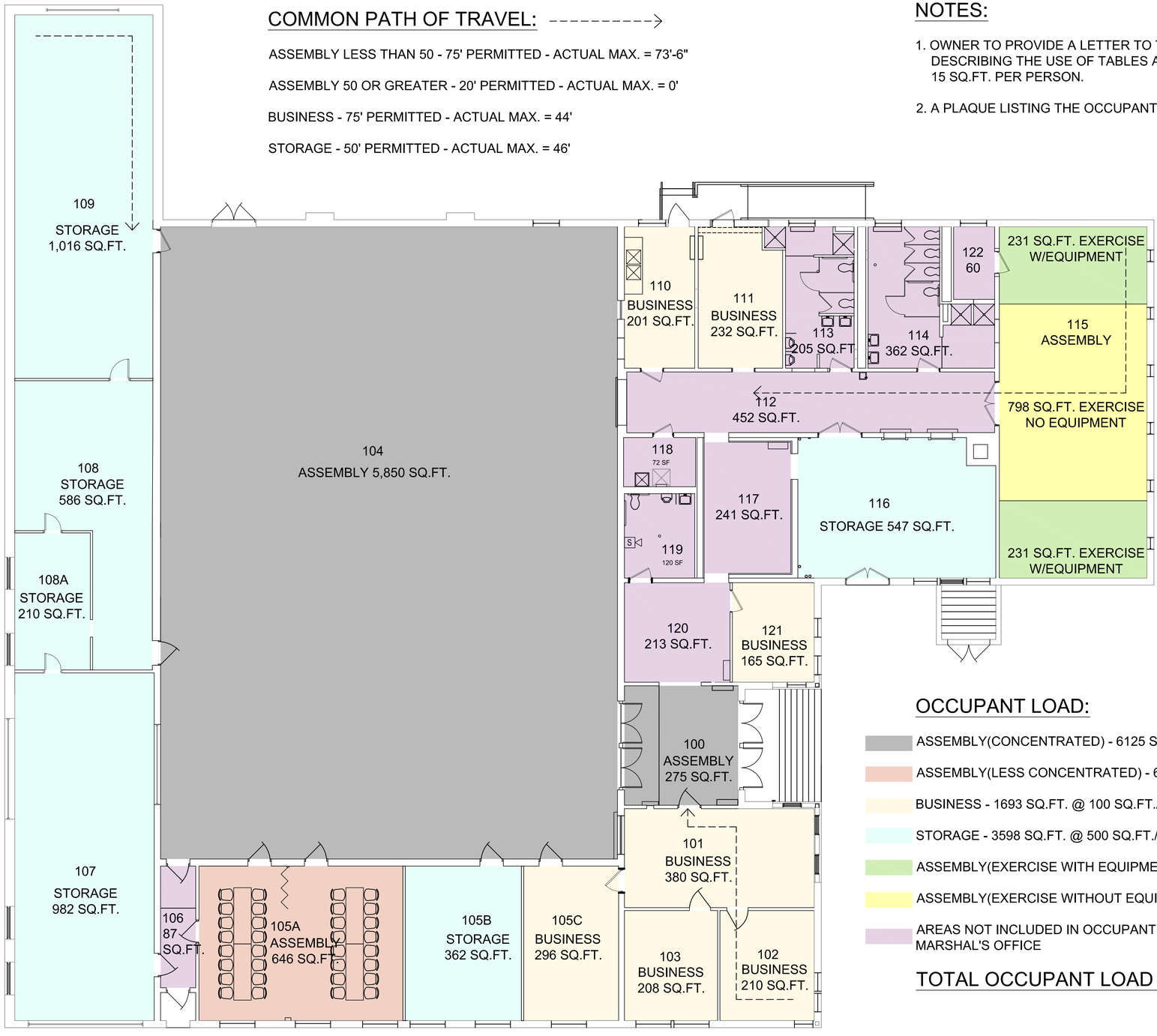
BUSINESS - 75' PERMITTED - ACTUAL MAX. = 44'

STORAGE - 50' PERMITTED - ACTUAL MAX. = 46'

NOTES:

1. OWNER TO PROVIDE A LETTER TO THE STATE FIRE MARSHAL'S OFFICE DESCRIBING THE USE OF TABLES AND CHAIRS IN SPACE 105A TO JUSTIFY 15 SQ.FT. PER PERSON.

2. A PLAQUE LISTING THE OCCUPANT LOAD AS 996 TO BE POSTED IN SPACE 100



OCCUPANT LOAD:

- ASSEMBLY(CONCENTRATED) - 6125 SQ.FT. @ 7SQ.FT./PERSON = 875
- ASSEMBLY(LESS CONCENTRATED) - 646 SQ.FT. @ 15 SQ.FT./PERSON = 43
- BUSINESS - 1693 SQ.FT. @ 100 SQ.FT./PERSON = 17
- STORAGE - 3598 SQ.FT. @ 500 SQ.FT./PERSON = 7
- ASSEMBLY(EXERCISE WITH EQUIPMENT) - 462 SQ.FT. @ 50 SQ.FT/PERSON = 9
- ASSEMBLY(EXERCISE WITHOUT EQUIPMENT)- 588 SQ.FT. @ 15 SQ.FT./PERSON = 39
- AREAS NOT INCLUDED IN OCCUPANT LOAD CALCULATION PER STATE FIRE MARSHAL'S OFFICE

TOTAL OCCUPANT LOAD = 990

FLOOR PLAN

0 4' 8' 16'

SCALE: 1/8" = 1'-0"

PLAN NORTH

NOTE:
THIS SHEET IS FOR OCCUPANT LOAD CALCULATIONS ONLY

Project:
HASTY COMMUNITY CENTER RENOVATIONS
48 Pettingill Park Road, Auburn, Maine
Bid No. 2017-008

Client:
City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

REGISTERED ARCHITECT JOHN E. HANSEN 1110 STATE OF MAINE

Consultant Name and Address:
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Sheet Title:
OCCUPANT LOAD DIAGRAM

No.	Revision/Issue	Date

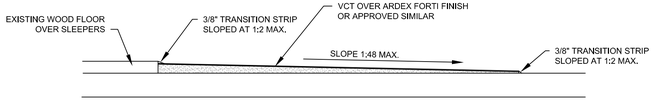
Design by:	Checked by:
JEH	MAD
Drawn by:	Approved by:
CMC	BMB
Project	Date.
NO. 964	OCTOBER 28, 2016

Sheet Number:
A1.3

DOOR SCHEDULE

NO.	SIZE	TYPE	HARDWARE	FRAME	REMARKS
01	3'-0" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP	STEEL WRAP AROUND	
02	3'-6" x 6'-8"	CASED OPENING			PATCH FLOOR AS REQUIRED
03	3'-0" x 6'-8"	FLUSH STEEL	LATCH, PRIVACY LOCK, LEVER HANDLE, STOP	STEEL WRAP AROUND	
04	2'-8" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, CLOSER, STOP		
05	3'-6" x 6'-8"	CASED OPENING			PATCH FLOOR AS REQUIRED
06	4'-0" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP	STEEL WRAP AROUND	PATCH FLOOR AS REQUIRED
07	6'-0" x 6'-6"	FLUSH STEEL HALF GLASS	PUSH, PULL, CLOSER, STOP		TEMPERED WIRE GLASS
08	6'-0" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP		
09	3'-0" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP		PROVIDE NEW 4" STEEL LINTEL
10	3'-0" x 6'-8"	FLUSH STEEL	PUSH. PULL, CLOSER, STOP		
11	3'-0" x 6'-8"	FLUSH STEEL	PUSH. PULL, CLOSER, STOP		PATCH FLOOR AS REQUIRED. PROVIDE NEW 4" STEEL LINTEL
12	3'-0" x 6'-8"	CASED OPENING			
13	3'-0" x 6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP		PATCH FLOOR AS REQUIRED. PROVIDE NEW 4" STEEL LINTEL
14	6'-6"± x 7'-0"±	INSULATED STEEL ROLL UP	CHAIN OR CRANK OPENER		
15	3'-0"x6'-8"	ALUMINUM STOREFRONT HALF GLASS WITH 3'-0" HALF GLASS SIDELIGHT AND TRANSOM TO FIT EXISTING OPENING	PUSH, PULL, LOCK, LEVER HANDLE, POWER DOOR OPERATOR, PANIC DEVICE		MAX. U FACTOR 0.70. LOW PROFILE THRESHOLD
16	3-0"x6'-8"	FLUSH STEEL	LATCH, LOCK, LEVER HANDLE, STOP		LOW PROFILE THRESHOLD. PROVIDE NEW 4" STEEL LINTEL
17	6'-0" x 6'-6"	FLUSH STEEL HALF GLASS	PUSH, PULL, CLOSER, STOP		TEMPERED WIRE GLASS
18	3'-0" x 6'-6"	FLUSH STEEL	PUSH, PULL, CLOSER, STOP, PANIC DEVICE - REUSE POWER DOOR OPERATOR, EXISTING OPERATOR TO BE REPAIRED TO MAKE OPERABLE		PROVIDE AUTOMATIC DOOR SIGN
19	3'-0" x 6'-6"				

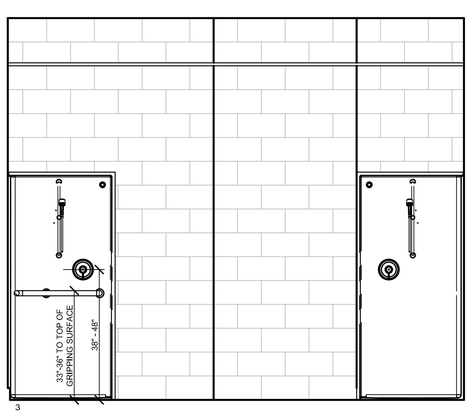
NOTE:
ALL LOCKABLE DOORS TO BE KEYED ALIKE. CONTRACTOR TO COORDINATE WITH OWNER FOR KEYING.



E / A3.1 TRANSITION DETAIL

0 6" 1' 2'

SCALE: 1" = 1'-0"



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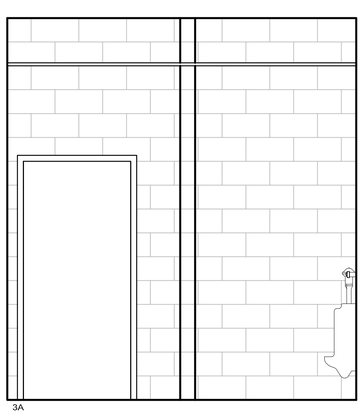

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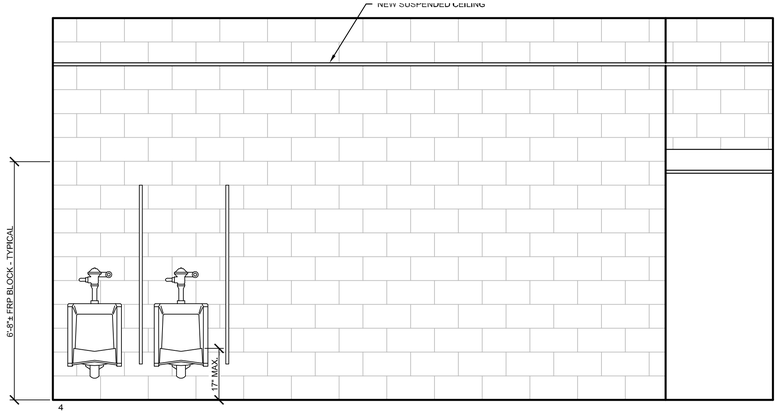

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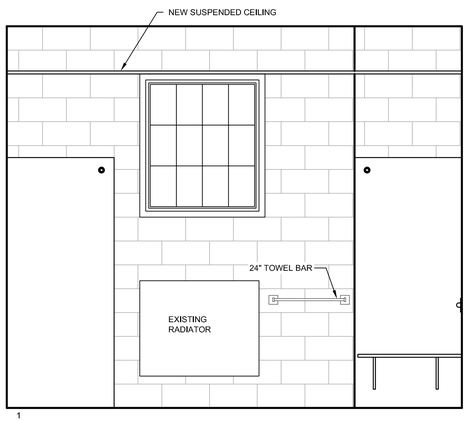

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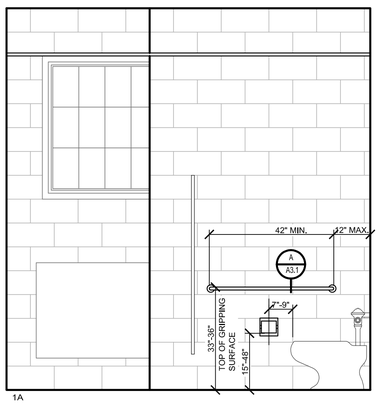

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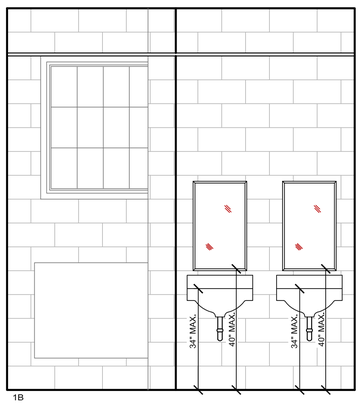

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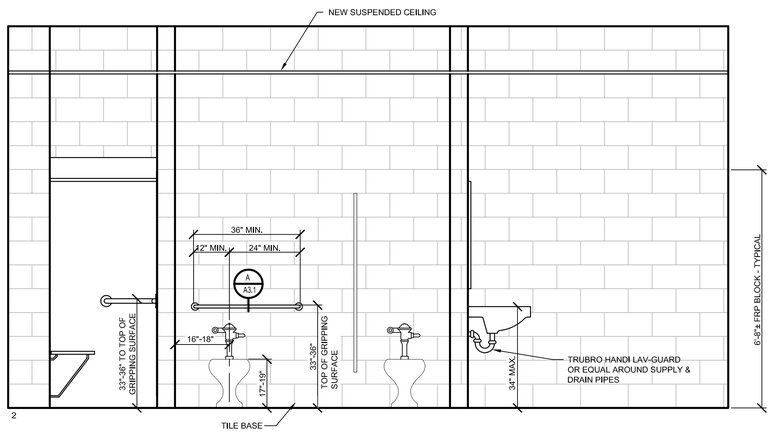

2

MEN 113 ELEVATIONS

NOTE: PROVIDE VINYL BASE AT GYP. BOARD WALLS

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

ELEVATION KEY

Project:

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Client:

City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

REGISTERED ARCHITECT JOHN E. HANSEN 1110 STATE OF MAINE

Consultant Name and Address:

ARCHITECT
JOHN E. HANSEN, ARCHITECT
632 SPRUCE HEAD ROAD
SOUTH THOMASTON, MAINE 04858
PHONE: (207) 594 - 5310 FAX: (207) 594 - 5370

Firm Name and Address:

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- ☐ 60% DESIGN DEVELOPMENT
- ☐ 90% DESIGN DEVELOPMENT
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Sheet Title:

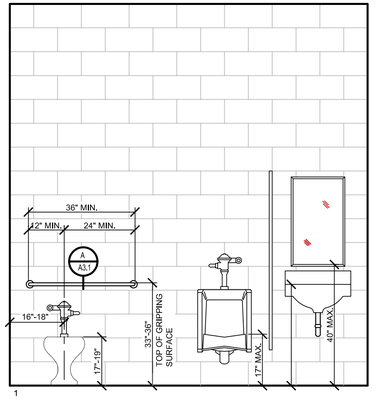
PROPOSED INTERIOR ELEVATIONS

No.	Revision/Issue	Date

Design by: JEH	Checked by: MAD
Drawn by: CMC	Approved by: BMB
Project: NO. 964	Date: OCTOBER 28, 2016

Sheet Number:

A3.1



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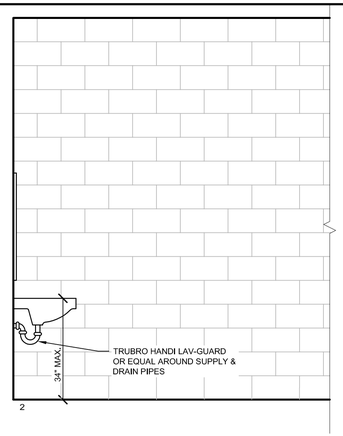

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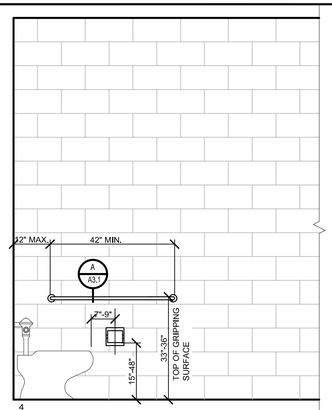

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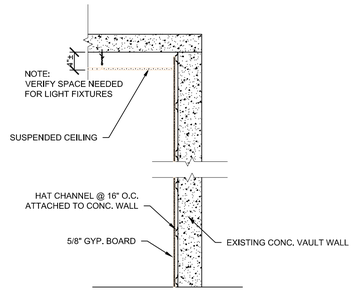


D
A3.2

DETAIL

0 1' 2' 4'

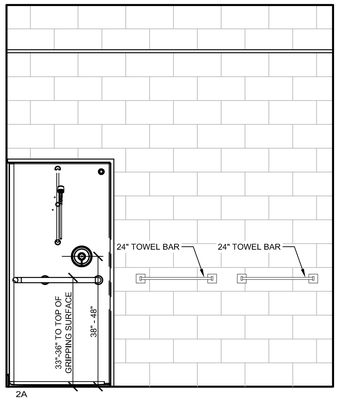
SCALE: 1/2" = 1'-0"

119 ELEVATIONS

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

ELEVATION KEY



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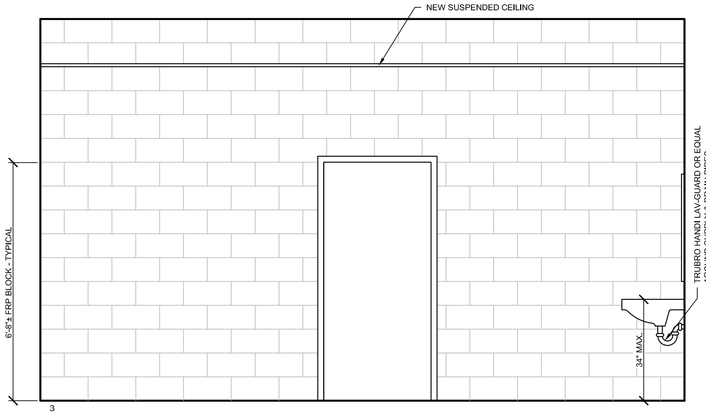

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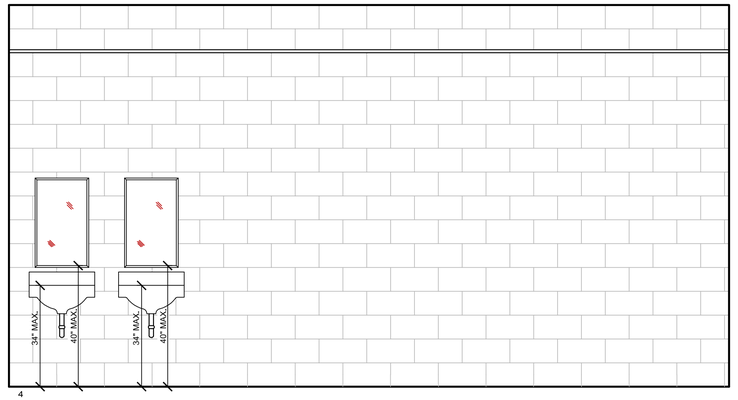

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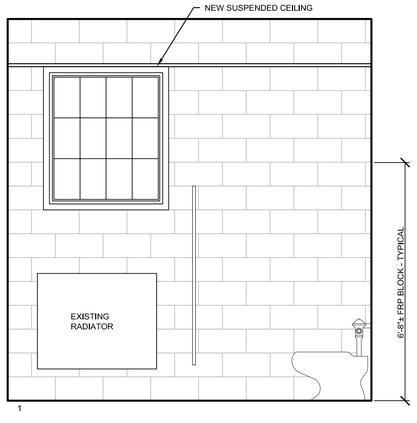

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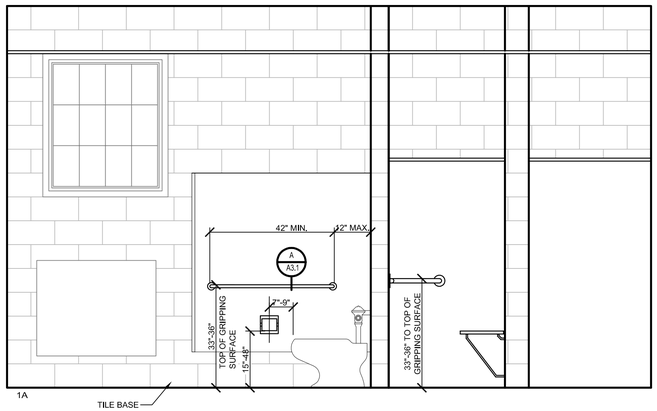

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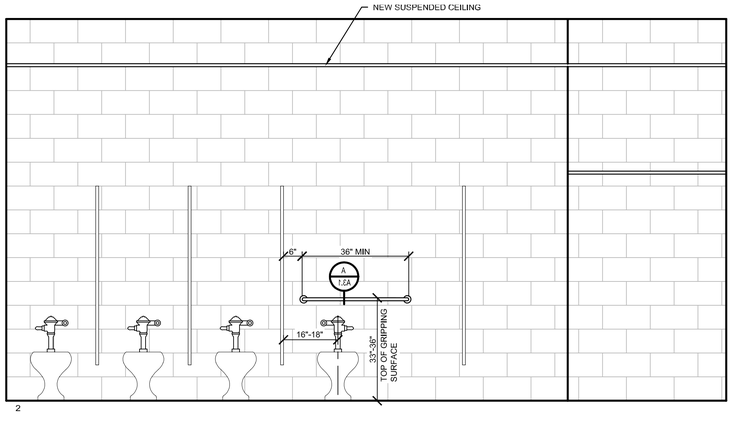

2

WOMEN 114 ELEVATIONS

0 1' 2' 4'

SCALE: 1/2" = 1'-0"

ELEVATION KEY

Project:

HASTY COMMUNITY CENTER RENOVATIONS

48 Pettingill Park Road, Auburn, Maine

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REGISTERED ARCHITECT
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Sheet Title:

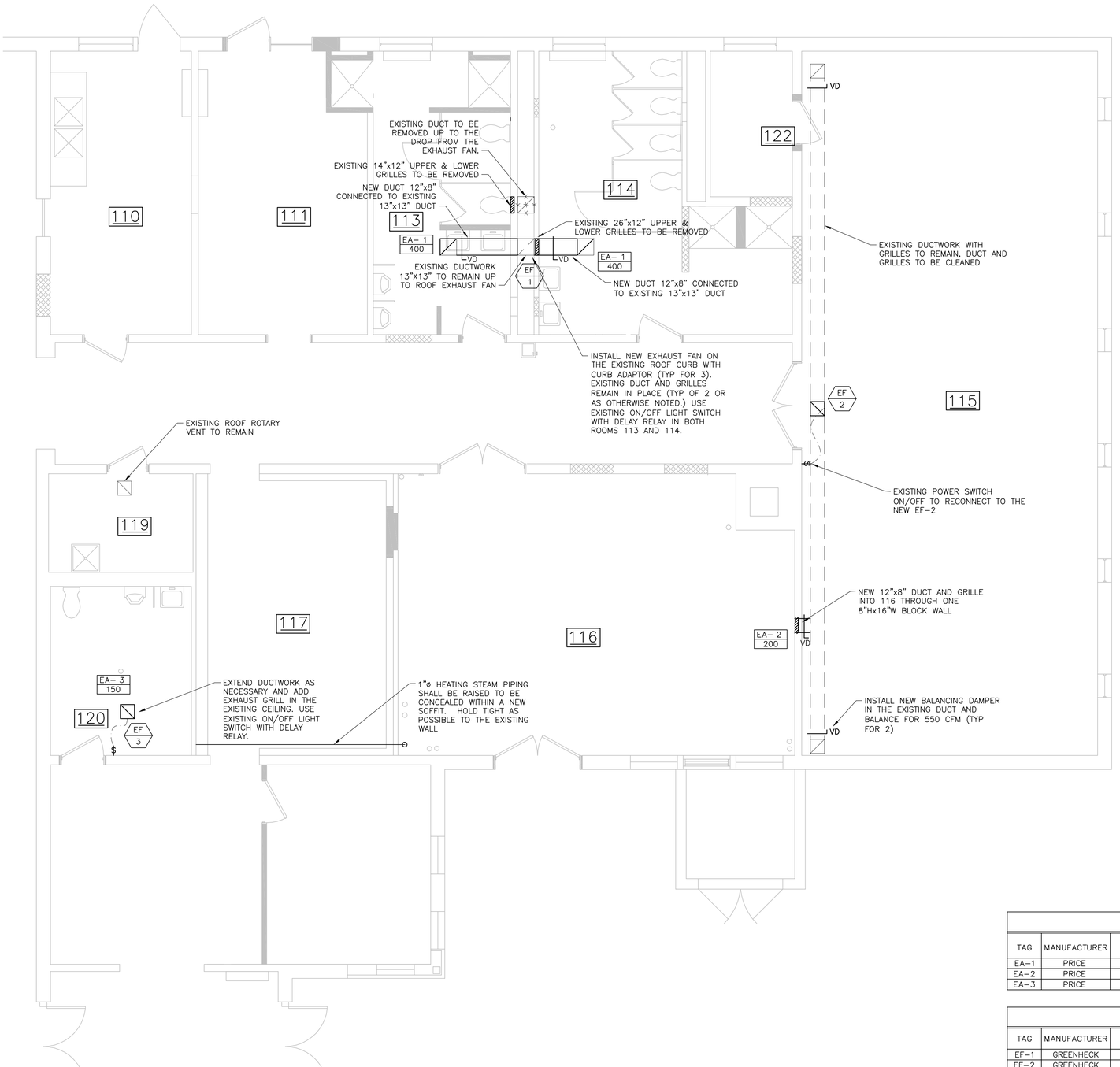
PROPOSED
INTERIOR ELEVATIONS

No.	Revision/Issue	Date

Design by:	Checked by:
JEH	MAD
Drawn by:	**Approved by:**
CMC	BMB
Project	**Date:**
NO. 964	OCTOBER 28, 2016

Sheet Number:

A3.2



1 MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL PIPING AND DUCTWORK IS SHOWN DIAGRAMMATICALLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD AND SHALL BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.

2. IT IS THE INTENT OF THESE DRAWINGS TO SHOW COMPLETE AND FUNCTIONAL SYSTEMS THAT ARE IN COMPLIANCE WITH ALL INDUSTRY STANDARDS AND APPLICABLE CODES. IF DISCREPANCIES ARE NOTED, NOTIFY THE OWNER OR HIS REPRESENTATIVE.

3. ALL DIMENSIONS ARE APPROXIMATE AND SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION.

4. ALL INSTALLATIONS SHALL CONFORM TO MANUFACTURER'S INSTRUCTIONS, INDUSTRY STANDARDS AND CURRENT CODES, AS ADOPTED BY THE STATE OR OTHER AUTHORITY HAVING JURISDICTION.

5. WHERE DUCTS OR PIPES PENETRATE WALLS, FLOORS, OR PARTITIONS, A SLEEVE SHALL BE INSTALLED AND THE SPACE BETWEEN THE STRUCTURE AND THE PIPE OR DUCT SHALL BE SEALED AIRTIGHT WITH AN APPROVED MATERIAL.

6. THE EXACT LOCATION OF CEILING EQUIPMENT TO BE DETERMINED BY ARCHITECTURAL TRADE.

7. COORDINATE ALL CEILING, WALL, AND FLOOR PENETRATIONS WITH OPENINGS SHOWN ON ARCHITECTURAL DRAWINGS.

8. ALL WORK UNDER THIS SECTION SHALL BE COORDINATED WITH ALL TRADES BEFORE ANY INSTALLATION.

9. ALL SUPPLEMENTAL STEEL CONNECTIONS TO THE MAIN STRUCTURE FOR SUPPORT OF HVAC EQUIPMENT SHALL BE BY THE HVAC CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE.

10. ALL PENETRATIONS THAT ALTER THE STRUCTURE SHALL BE APPROVED BY THE ENGINEER.

11. ALL EXPOSED EQUIPMENT SHALL HAVE COLORS SELECTED BY THE OWNER, UNLESS OTHERWISE NOTED.

12. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF PENETRATIONS THROUGH WALLS WHERE EQUIPMENT HAS BEEN REMOVED.

CONSTRUCTION NOTES:

1. REMOVE EXISTING ROOF FANS / VENTALATOR AND LEAVE IN PLACE ROOF CURBS FOR EF–1, EF–2 AND EF–3.

2. DISCONNECT POWER TO EXISTING FANS.

3. INSTALL NEW ROOF EXHAUST FANS EF–1 TO EF–3 ON EXISTING ROOF CURBS WITH NEW CURB ADAPTERS.

4. CONNECT TO POWER EF–1 TO EF–3

5. CONNECT EXHAUST FANS TO OPERATE WITH LIGHT SWITCH WITH DELAY RELAY IN THE BATHROOMS FOR EF–1 AND EF–3.

6. ALL EXISTING DUCTWORK TO REMAIN SHALL BE CLEANED FROM THE INTAKE GRILLES TO THE EXHAUST FAN.

7. REMOVE AND IN–FILL EXISTING UPPER AND LOWER GRILLES IN ROOMS 113 AND 114 DUE TO NEW DROP CEILING INSTALLATION.

8. BALANCE EXHAUST FLOW FROM EACH BATHROOM RM 113 AND 114 FOR 400 CFM AND RM 120 150 CFM.

9. EXHAUST FAN EF–2 SHALL WORK ON EXISTING ON/OFF POWER SWITCH.

10. INSTALL NEW BALANCING DAMPERS FOR EXISTING GRILLES (FOR EF–2) AND BALANCE FOR 550 CFM.

11. THERMAL INSULATE THE LAST 10 FEET EXHAUST DUCT TO THE EXHAUST FAN ON THE ROOF WITH 1.5" FLEXIBLE WRAP AROUND INSULATION.

MECHANICAL SYMBOLS

NEW DUCT
EXISTING DUCT
EQUIPMENT DESIGNATION (EF 2)
GRILLS AND DIFFUSER (EA– X / XXX)
POINT OF CONNECTION

REGISTER, GRILLE AND DIFFUSER SCHEDULE

TAG	MANUFACTURER	MODEL	RECT. NECK SIZE	ROUND NECK SIZE	FACE SIZE	CFM RANGE	FRAME TYPE	MOUNTING	NC LEVEL	NOTES
EA–1	PRICE	620	16"x10"	–	16"x10"	–400	LAY–IN	LAY–IN	<28	WHITE ALUMINUM
EA–2	PRICE	620	12"x8"	–	12"x8"	–200	WALL	WALL	<28	WITH BALANCING DAMPER, WHITE ALUMINUM
EA–3	PRICE	620	10"x10"	–	10"x10"	–150	CEILING	CEILING	<28	FOR HARD CEILING, WHITE ALUMINUM

FAN SCHEDULE

TAG	MANUFACTURER	MODEL	TYPE	LOCATION	CFM	S.P. (IN. W.G.)	FAN RPM	MOTOR DATA HP	V	PH	RPM	DRIVE TYPE	NC	NOTES
EF–1	GREENHECK	GB091–4	ROOF EX	ROOF	800	.5	1435	1/4	115	1	–	BD	9.6	① ② ③ ④ ⑥ ⑦ ⑧
EF–2	GREENHECK	GB121–3	ROOF EX	ROOF	1300	.5	1327	1/3	115	1	–	BD	4.7	① ③ ④ ⑥ ⑦ ⑧ ⑨
EF–3	GREENHECK	GB071–6	ROOF EX	ROOF	150	.5	1236	1/6	115	1	–	BD	6.9	① ② ⑤ ④ ⑥ ⑦ ⑧

1. SUPPLY WITH BACK DRAFT DAMPERS.
2. INTERLOCK WITH LIGHT SWITCH AND DELAY RELAY
3. SUPPLY WITH STARTERS.
4. SUPPLY WITH ROOF CURB ADAPTER.
5. NOT USED
6. PROVIDE WITH BIRD SCREEN
7. SUPPLY WITH FACTORY MOUNTED DISCONNECT NEMA–3R
8. MOTOR AND DRIVES ISOLATED ON SHOCK MOUNTS
9. ON ON/OFF POWER SWITCH

Project:

HASTY COMMUNITY CENTER RENOVATIONS
48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

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City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

STATE OF MAINE — MATEI T. ILINA — No. 9348 — LICENSED PROFESSIONAL ENGINEER

Consultant Name and Address:

ilina engineering PA
DESIGN FOR A BETTER LIFE
61 MAIN STREET, SUITE 58 BANGOR, MAINE 04401
PHONE/FAX: 207.992.9181 E-MAIL: ilinaengineering@roadrunner.com

Firm Name and Address:

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Sheet Title:

MECHANICAL LAYOUT

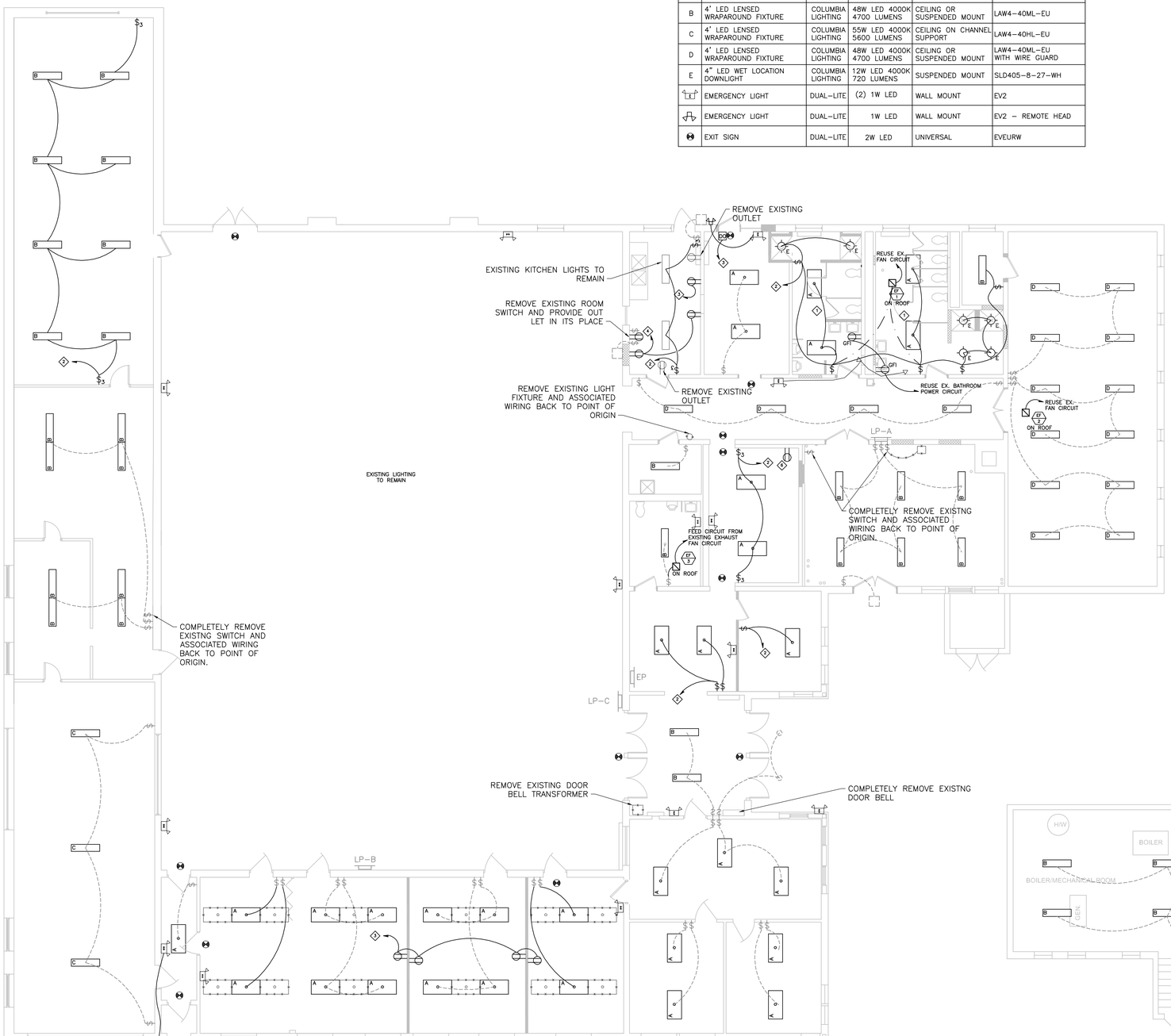
No.	Revision/Issue	Date

Design by: MI
Checked by: MAD
Drawn by: RR
Approved by: BMB
Project NO. 964
Date. OCTOBER 28, 2016

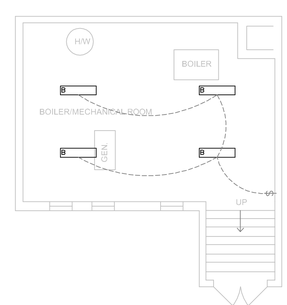
Sheet Number:

M-1

TYPE	DESCRIPTION	MANUF.	LAMPS	MOUNTING	MODEL #
A	2' X 4' LED LENSED TROFFER	LoMAR LIGHTING	50W LED 4000K 5953 LUMENS	CEILING GRID	FPLN245040D
B	4' LED LENSED WRAPAROUND FIXTURE	COLUMBIA LIGHTING	48W LED 4000K 4700 LUMENS	CEILING OR SUSPENDED MOUNT	LAW4-40ML-EU
C	4' LED LENSED WRAPAROUND FIXTURE	COLUMBIA LIGHTING	55W LED 4000K 5600 LUMENS	CEILING ON CHANNEL SUPPORT	LAW4-40HL-EU
D	4' LED LENSED WRAPAROUND FIXTURE	COLUMBIA LIGHTING	48W LED 4000K 4700 LUMENS	CEILING OR SUSPENDED MOUNT	LAW4-40ML-EU WITH WIRE GUARD
E	4" LED WET LOCATION DOWNLIGHT	COLUMBIA LIGHTING	12W LED 4000K 720 LUMENS	SUSPENDED MOUNT	SLD405-8-27-WH
	EMERGENCY LIGHT	DUAL-LITE	(2) 1W LED	WALL MOUNT	EV2
	EMERGENCY LIGHT	DUAL-LITE	1W LED	WALL MOUNT	EV2 - REMOTE HEAD
	EXIT SIGN	DUAL-LITE	2W LED	UNIVERSAL	EVEURW



1 ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"



2 BASEMENT ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN COMPLIANCE WITH NFPA-70, NATIONAL ELECTRIC CODE, 2014 EDITION AND THE LOCAL AUTHORITY HAVING JURISDICTION.
2. THIS DRAWING IS DIAGRAMMATIC IN NATURE AND IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND PROVIDE ALL COMPONENTS AND MATERIALS FOR A COMPLETE AND OPERATIONAL INSTALLATION AT NO ADDITIONAL COST TO THE OWNER. CATALOG NO. PROVIDED IS TO BE FIELD VERIFIED BY THE CONTRACTOR FOR CORRECT INSTALLATION, MOUNTING, CONTROLS, VOLTAGE, ETC. AS NECESSARY.
3. THE INTENT OF THE WORK IS TO REPLACE THE INDICATED EXISTING LIGHT FIXTURES AND EMERGENCY LIGHTS WITH LED EQUIVALENTS IN A ONE-FOR-ONE MANNER.
4. EXISTING LIGHT FIXTURES THAT ARE NOT INCORPORATED IN THE NEW DESIGN ARE TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING FOR THAT FIXTURE. CEILING TO BE REPAIRED, PATCHED, OR PAINTED TO MATCH EXISTING.
5. REUSE EXISTING CIRCUIT WIRING TO SWITCHES. REPLACE SWITCHES AND WIRE FROM SWITCHES TO NEW LIGHT FIXTURES. DOCUMENT EXISTING AND NEW CIRCUITS AND PANEL SCHEDULES IN THE FIELD FOR INCLUSION IN THE RECORD DRAWINGS.
6. EXISTING LIGHT SWITCH LOCATIONS ARE TO BE FIELD VERIFIED AND DOCUMENTED FOR INCLUSION IN THE RECORD DRAWINGS.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL WIRING AND CONDUITS REQUIRED FOR RECONNECTION OF NEW AND EXISTING EQUIPMENT AND FIXTURES TO REMAIN.
8. ALL EXPOSED CONDUIT SHALL BE EMT, 3/4" MINIMUM. PROPERLY SUPPORTED MC CABLE ASSEMBLIES MAY BE USED ABOVE CEILINGS AND IN WALLS WHERE REQUIRED. FLEXIBLE LIQUIDTIGHT WHIPS MAY BE USED FOR CONNECTIONS TO EXPOSED SUSPENDED FIXTURES.
9. ALL NEW EXPOSED CONDUIT SHALL BE PAINTED TO MATCH THE ADJACENT SURFACE COLOR BEING ATTACHED TO.
10. UNLESS OTHERWISE NOTED ALL HOMERUNS FOR 15A OR 20A CIRCUITS SHALL BE 2#12AWG & #12 GROUND. HOMERUNS FED FROM 20A, 1P CIRCUITS IN EXCESS OF 100 FEET (FOR 120V CIRCUITS) SHALL BE #10AWG. ALL WIRING SHALL BE COPPER.
11. THE OWNER RESERVES THE RIGHT TO RETAIN ANY EQUIPMENT OR FIXTURES BEING REMOVED. IT WILL BE THE CONTRACTORS RESPONSIBILITY TO PROPERLY DISPOSE OF ALL CONSTRUCTION WASTE.
12. THE CONTRACTOR IS RESPONSIBLE REPLACE ANY DAMAGED SUSPENDED CEILING GRID OR TILES AS A RESULT OF PERFORMING THE WORK.
13. CONNECT NEW EXHAUST FANS TO CIRCUITS OF EXISTING FANS BEING REMOVED. FANS ARE SUPPLIED WITH DISCONNECTS AND STARTERS. CONTRACTOR IS RESPONSIBLE TO INTERCONNECT FAN WITH ROOM LIGHTING SWITCH FOR CONTROL
14. THIS PROJECT INTENDS TO PURSUE EFFICIENCY MAINE PRESCRIPTIVE AND/OR CUSTOM INCENTIVES WHERE APPLICABLE. THE CONTRACTOR SHALL COORDINATE THE ACTIVITIES ASSOCIATED WITH EFFICENCY MAINE INCETIVE APPROVAL PROCESS INCLUDING BUT NOT LIMITED TO; PREPARATION AND SUBMISSION OF ALL APPLICABLE INCENTIVE APPLICATIONS, RECEIVING PRE-APPROVAL WHEN APPLICABLE, THE TRACKING AND SUBMISSION OF MEASURE SPECIFIC INVOICES TO EFFICIENCY MAINE WITHIN THE PRESCRIBED TIMEFRAME, AND PROVIDE FOLLOW-UP AS NECESSARY UNTIL THE CITY OF AUBURN RECEIVES THE INCENTIVES.
14. ALL NEW SWITCHES 1 GANG OR MORE THAT ARE BEING REMOVED SHALL BE REPLACED WITH A NEW STAINLESS STEEL COVER PLATE.

WORK NOTES:

1. EXISTING SWITCHES AND OUTLET LOCATIONS IN THESE ROOMS SHALL BE REMOVED AND THE NEW DEVICES SHOWN SHALL BE INSTALLED. FEED POWER FROM EXISTING CIRCUIT SERVICING THESE AREAS.
2. CONNECT TO EXISTING LIGHTING CIRCUIT WITHIN THIS ROOM.
3. RUN A NEW ELECTRICAL CIRCUIT BACK TO NEAREST ELECTRICAL PANEL. PROVIDE A NEW 1P 20A BREAKER IN PANEL FOR THIS CIRCUIT.
4. FEED NEW DEVICES FROM EXISTING DEVICE CIRCUIT BEING REMOVED IN THIS ROOM
5. CONNECT TO EXISTING POWER CIRCUIT IN THIS ROOM
6. PROVIDE NEW OUTLET IN EXISTING LOCATION TO FIT FLUCH WITH NEW WALL SURFACE.

ELECTRICAL SYMBOLS

- NEW DEVICE
- EXISTING DEVICE
- DEVICE TO BE REMOVED
- LIGHT FIXTURE
- (2)#12+#12GND UNO
- SWITCH 3-3 WAY
- HOMERUN ARROW
- DUPLEX RECEPTACLE GFI-GROUND FAULT DEVICE

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Sheet Title:

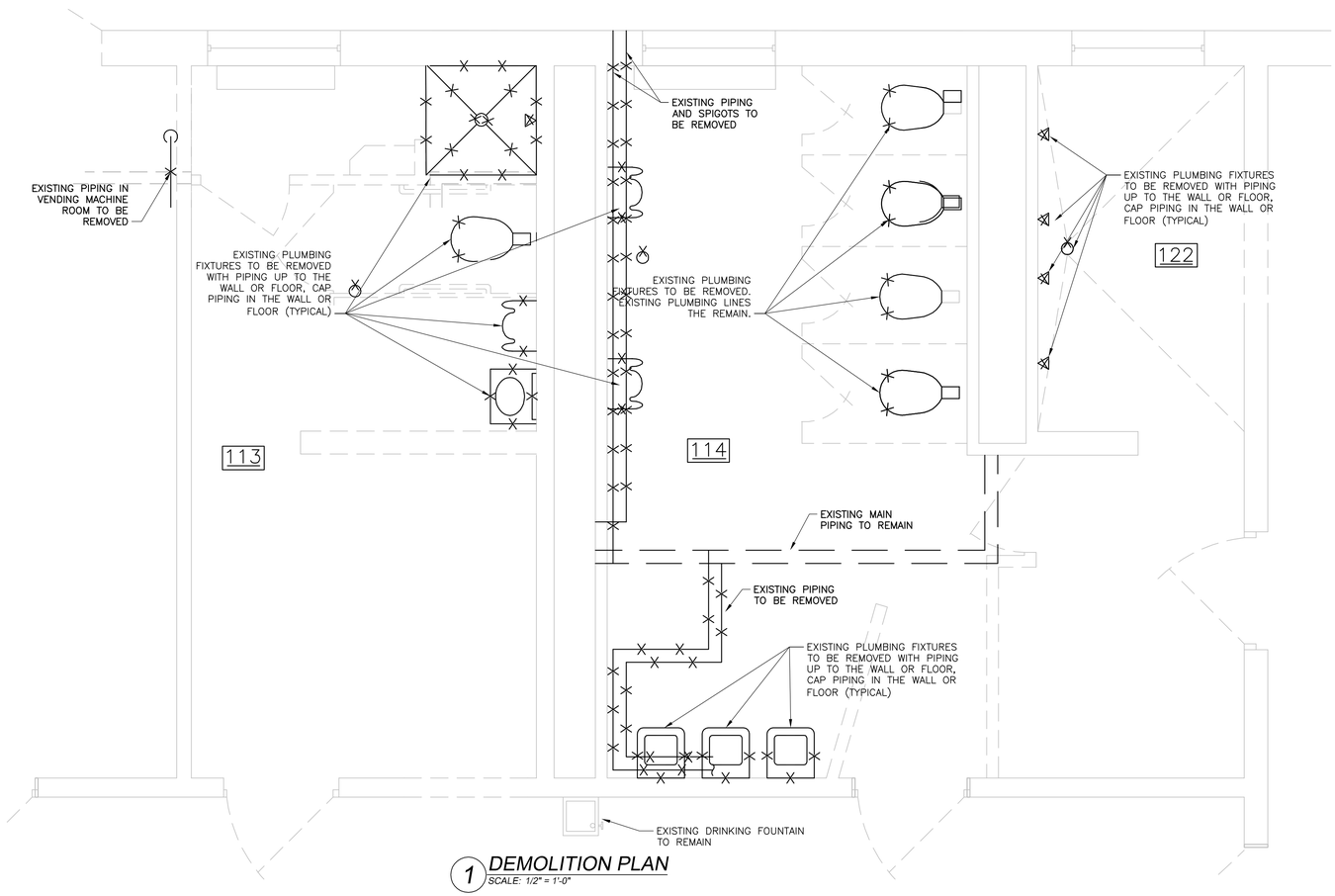
ELECTRICAL PLAN

No.	Revision/Issue	Date

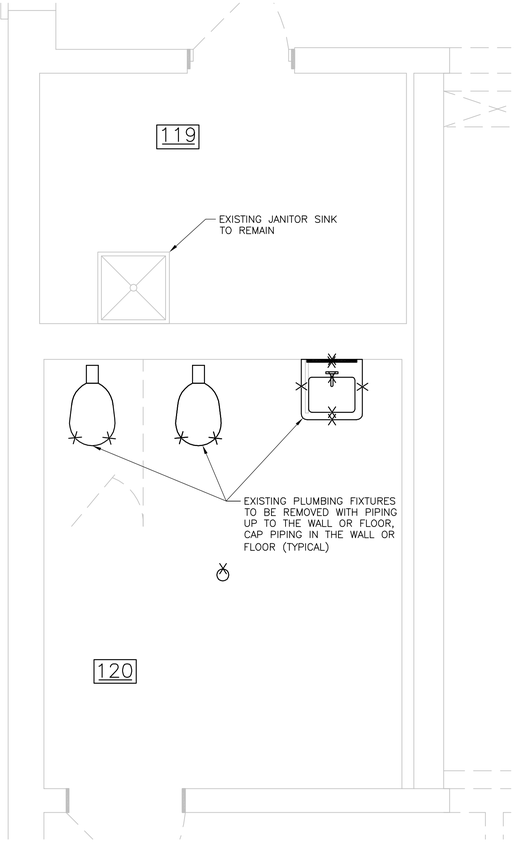
Design by: MI	Checked by: MAD
Drawn by: RR	Approved by: BMB
Project NO. 964	Date. SEPTEMBER 28, 2016

Sheet Number:

E-1



1 DEMOLITION PLAN
SCALE: 1/2" = 1'-0"



2 DEMOLITION PLAN
SCALE: 1/2" = 1'-0"

GENERAL NOTES;

1. ALL EXISTING PLUMBING EQUIPMENT TO REMOVE IS SHOWN ON THIS DRAWING. EACH PLUMBING FIXTURE SHALL BE REMOVED WITH THE RELATED PIPING UP TO THE FLOOR AND/OR WALL AND BE CAPPED.

LEGEND

EQUIPMENT TO BE REMOVED

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Consultant Name and Address:

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Sheet Title:

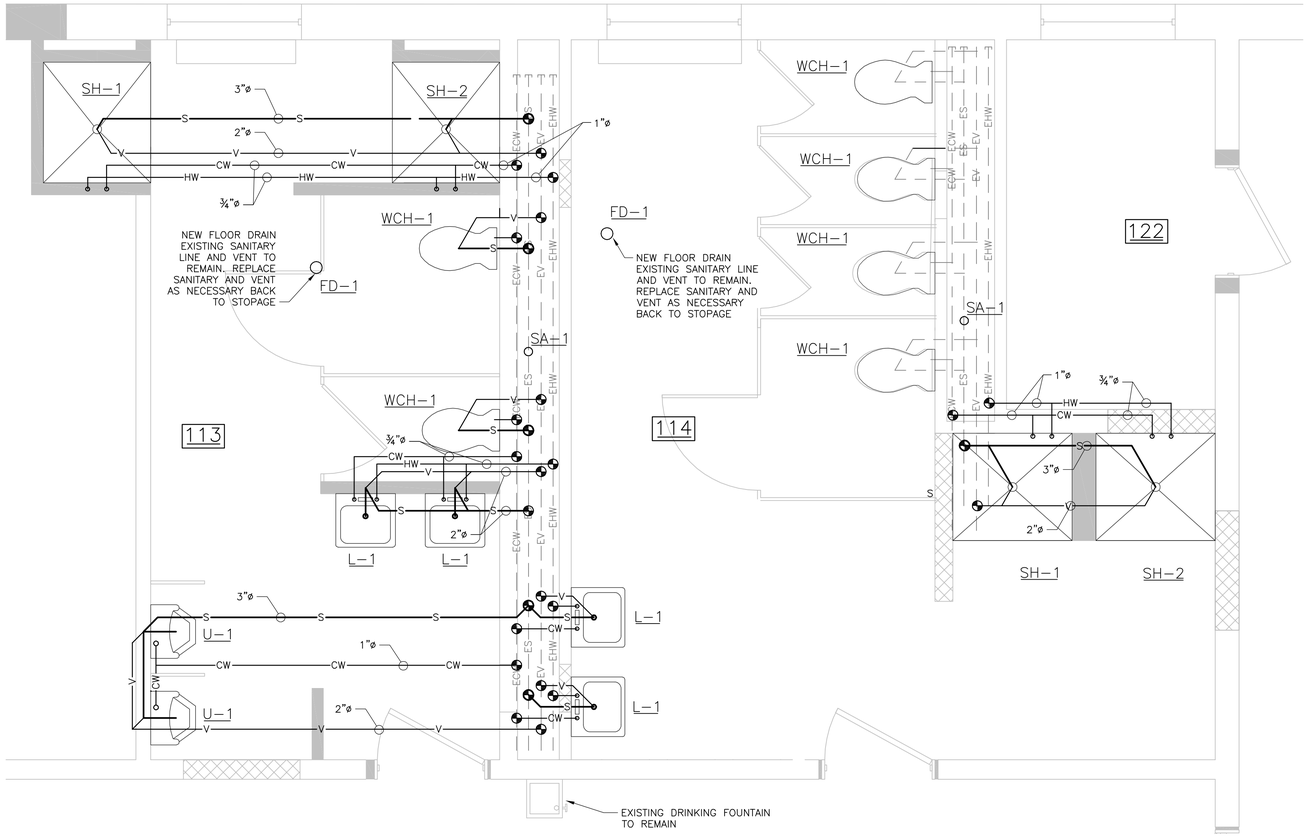
PLUMBING DEMOLITION

No.	Revision/Issue	Date

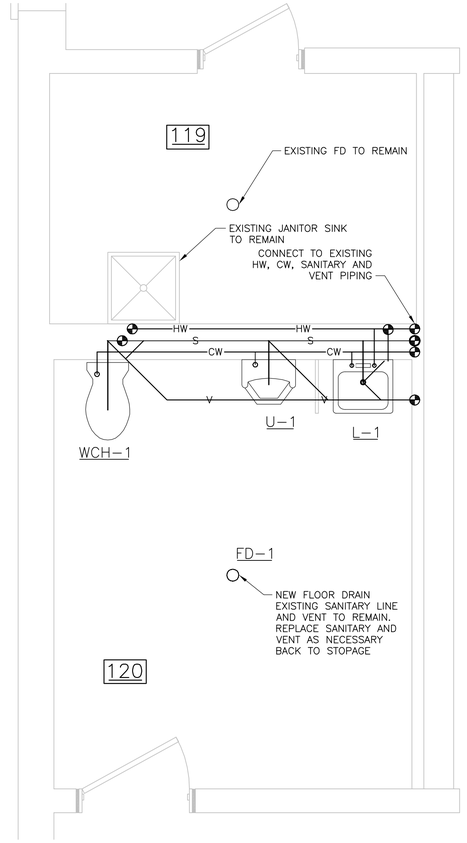
Design by:	Checked by:
MI	MAD
Drawn by:	**Approved by:**
RR	BMB
Project	**Date.**
NO. 964	OCTOBER 28, 2016

Sheet Number:

P-1



1 TOILET PLUMBING PLAN FOR RM 113 &114
SCALE: 1/2" = 1'-0"



2 TOILET PLUMBING PLAN FOR RM 120
SCALE: 1/2" = 1'-0"

FIXTURE SCHEDULE

TAG	FIXTURE	PLUMBING CONNECTIONS				DESCRIPTION	NOTES
		S	V	CW	HW		
FD–1	FLOOR DRAIN	3"	1 1/2"	–	–	WATTS FD–100–C–A	INSTALL FLUSH W/NEW VCT TILE FLOOR
L–1	LAVATORY	2"	1 1/4"	1/2"	1/2"	AMERICAN STANDARD LUCERNE MODEL 0356 0356 W/CHICAGO 895–317 FAUCET, ANGLE SUPPLIES W/STOPS & TRUEBRO LAV GUARD	WALL HUNG
SA–1	SHOCK ABSORBER	–	–	1/2"	–	PPP SC–500	
U–1	URINAL	2"	1 1/2"	1"	–	AMERICAN STANDARD MODEL 6590.001 W/ROYAL 186–1 FLUSH VALVE	
WCH–1	WATER CLOSET	3"	2"	1"	–	AMERICAN STANDARD MADERA 3043 ELONGATED BOWL 1.6 GPF W/SLOAN FLUSH VALVE, OPEN SEAT, LESS LID	FLOOR MOUNTED – FLUSH VALVE
SH–1	SHOWER	2"	1 1/2"	1/2"	1/2"	AQUARIUS MODEL G–3637BF3P RRF–00 40.25"x38.5"x77.5" WITH SIMMONS FAUCET MODEL S–9603–PLR	
SH–2	ADA SHOWER	2"	1 1/2"	1/2"	1/2"	AQUARIUS MODEL G–3637BF3P WITH GRAB BAR AND SEAT–ADA ACCESSABLE – OD 40.25"x38.5"x77.5" WITH SIMMONS FAUCET MODEL S–9603–PLR	

ABBREVIATIONS (PLUMBING)

DRINKING FOUNTAIN	DF
FLOOR DRAIN	FD
LAVATORY	L
TOILET	WC
TOILET–HANDICAP	WCH
URINAL	U
VENT THROUGH ROOF	VTR

PLUMBING PIPING SYMBOLS

COLD WATER	CW
HOT WATER	HW
SANITARY DRAIN	S
VENT	V
EXISTING COLD WATER	ECW
EXISTING HOT WATER	EHW
EXISTING SANITARY DRAIN	ES
EXISTING VENT	EV
EXISTING PIPING	
PIPING DROP	
PIPING RISE	
FLOOR CLEANOUT	FCO
FLOOR DRAIN	FD
BALL VALVE	
NEW PIPING CONNECTION TO EXISTING PIPE	
EQUIPMENT TO BE REMOVED	

GENERAL NOTES;

1. IT IS THE INTENT OF THESE DRAWINGS TO SHOW A COMPLETE PLUMBING SYSTEM IN ACCORDANCE WITH THE MAINE STATE PLUMBING CODE AND ANY LOCAL PLUMBING RULES. IF ANY DISCREPANCIES ARE NOTED, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

2. ALL PIPING SHALL BE CONCEALED FROM THE VIEW OF THE OCCUPANTS IN FINISHED SPACES UNLESS APPROVED BY THE OWNER OR HIS REPRESENTATIVE. THE PLUMBING PLAN IS SCHEMATIC. PIPING SHOWN ON THE PLAN THAT IS NOT CONCEALED IN PARTITIONS IS SHOWN THAT WAY FOR CLARITY.

3. ALL PIPING SHALL BE INSTALLED TO ALLOW FOR EXPANSION. USE SWING JOINTS, OFFSETS, EXPANSION JOINTS, ETC.

4. ALL BURIED DOMESTIC WATER PIPES SHALL BE TYPE "K" COPPER WITH FLARED FITTINGS.

5. WATER PIPING SHALL NOT BE RUN IN ANY AREA THAT COULD BE SUBJECT TO FREEZING. RUN ALL PIPING ON THE WARM SIDE OF BUILDING INSULATION.

6. ALL PLUMBING FIXTURES SHALL HAVE SHUT–OFF VALVES ON COLD (AND HOT) WATER SUPPLIES.

7. THE DESIGN OF THE WATER SYSTEM IS BASED ON 80 PSI (STATIC) AT THE ENTRANCE.

8. SLOPE ALL HORIZONTAL WASTE PIPING AT A MINIMUM SLOPE OF ONE QUARTER INCH PER FOOT TOWARD THE POINT OF DISPOSAL UNLESS OTHERWISE NOTED.

9. INSTALL ALL HORIZONTAL VENT PIPING LEVEL OR SLOPED TOWARD THE DRAINAGE PIPE THAT IT SERVES.

10. ALL SANITARY AND VENT PIPING SHALL BE PVC FOR SANITARY AND VENT. CONNECT TO EXISTING CAST IRON PIPING.

11. ALL SOLDERED JOINTS IN THE PLUMBING SYSTEM SHALL BE MADE WITH LEAD FREE SOLDER.

12. ALL PLUMBING PIPING SHALL BE LEAK TESTED PER THE MAINE STATE PLUMBING CODE, IN THE PRESENCE OF THE LOCAL PLUMBING INSPECTOR. ALL LEAKS SHALL BE REPAIRED AND THE SYSTEM, OR THAT PORTION OF THE SYSTEM RETESTED.

13. BEFORE INSTALLING THE NEW FLOOR DRAINS, THE CONTRACTOR SHALL CHECK IF THE EXISTING P–TRAP ARE IN GOOD CONDITION. IF NOT CHANGE P–TRAP ACCORDINGLY.

14. COORDINATE ALL PLUMBING INSTALLATION WITH ARCHITECTURAL, STRUCTURAL, FIRE PROTECTION, MECHANICAL AND ELECTRICAL TRADES.

Project:

HASTY COMMUNITY CENTER RENOVATIONS
48 Pettingill Park Road, Auburn, Maine

Bid No. 2017-008

Client:

City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Legend:

STATE OF MAINE — MATEI T. ILINA — No. 9548 — LICENSED PROFESSIONAL ENGINEER

Consultant Name and Address:

ilina engineering PA
DESIGN FOR A BETTER LIFE
61 MAIN STREET, SUITE 58 BANGOR, MAINE 04401
PHONE/FAX : 207.992.0181 E-MAIL: ilinaengineering@midmaine.com

Firm Name and Address:

CORDJIA
CAPITAL PROJECTS GROUP
Camden, ME | Portland, ME | York, ME
207.236.9970 | www.cordjiacapitalprojects.com

Drawing Status:

- ☐ CONCEPT DESIGN
- ☐ 30% DESIGN DEVELOPMENT
- ☐ 60% DESIGN DEVELOPMENT
- ☐ 90% DESIGN DEVELOPMENT
- ■ 100% BID DOCUMENT
- ☐ 100% CONSTRUCTION DOCUMENT
- ☐ RECORD DOCUMENT

NO DRAWING SHALL BE CONSIDERED AS A CONSTRUCTION DOCUMENT UNLESS IT BEARS A SIGNED IDENTIFICATION SEAL

Sheet Title:

PLUMBING LAYOUT

No.	Revision/Issue	Date

Design by:	Checked by:
MI	MAD
Drawn by:	**Approved by:**
RR	BMB
Project	**Date.**
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