

City of Auburn, Maine

"Maine's City of Opportunity"

Financial Services



July 28, 2016

Dear Bidder:

The City of Auburn is accepting written proposals for the Engine #5 Fire Station for a **Roof Replacement Project**, located at 651 Center Street, 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 Thursday, August 4, 2016 at 9:00 a.m. at the Engine #5 Fire Station, 651 Center Street, 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:

"Engine #5 Fire Station, Roof Replacement Project – Bid #2017-002."

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, August 18, 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

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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 **“Engine #5 Fire Station, Roof Replacement Project – Bid #2017-002.”** 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.

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. Payment and performance bonds may be requested from the contractor who is awarded this contract which if elected will be executed by change order. 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, August 18, 2016 at 2:00 PM

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 (30) 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.

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: **Engine #5 Fire Station, Roof Replacement Project – Bid #2017-002**

BID BREAKDOWN SCHEDULE OF VALUES

<u>Item</u>	<u>Description</u>	<u>Value</u>
1.	General Conditions	\$ _____ . _____
2.	Bonds (if required) & Insurance	\$ _____ . _____
3.	Demolition & Disposal	\$ _____ . _____
4.	Rough Carpentry	\$ _____ . _____
5.	Membrane Roofing	\$ _____ . _____
6.	Poly-iso Insulation	\$ _____ . _____
7.	Sheet Metal Flashings and Trim	\$ _____ . _____
8.	Roof Specialties	\$ _____ . _____
9.	Joint Sealers	\$ _____ . _____
10.	Safety, Security and Temporary Protection	\$ _____ . _____
11.	Lift(s), Equipment and Staging	\$ _____ . _____
12.	Plumbing	\$ _____ . _____
13.	Other (specify) _____	\$ _____ . _____
14.	Other (specify) _____	\$ _____ . _____
15.	Other (specify) _____	\$ _____ . _____
16.	TOTAL BASE BID (Sum of Items 1 through 15)	\$ _____ . _____

TOTAL OF ALL LINE ITEMS IN SCHEDULE OF VALUES MUST EQUAL FINAL BASE BID. THERE MUST BE AMOUNTS IN EACH OF THE SPECIFIED ITEMS ABOVE.

PROJECT SCHEDULE

Estimated Start Date: August 25, 2016 Substantial Completion Date: September 30, 2016

FAILURE TO PROPERLY COMPLETE THIS ATTACHEMENT MAY BE CONSIDERED A NON RESPONISVE PROPOSAL AND MAY BE REJECTED AT THE OWNERS DISCRETION.

SAMPLE AGREEMENT

THIS AGREEMENT is made this ### day of *Month Year*, by and between the CITY OF AUBURN, a municipal corporation existing under the laws of the State of Maine and located in the County of Androscoggin, State of Maine (hereinafter "CITY"), *Company Name, Address, EIN*, (hereinafter "CONTRACTOR"),

WITNESSETH:

In consideration of the mutual covenants and conditions contained herein, the CITY and the CONTRACTOR agree as follows:

SPECIFICATIONS:

1. The CONTRACTOR shall furnish all of the material and perform all of the work shown on the drawings and described in the specifications entitled: *Bid # XXXXX Bid Title* which are attached hereto and made a part hereof, and the CONTRACTOR covenants that it shall do everything required by this Agreement, the Special Provisions of the Agreement, the Invitation to Bid and the Specifications in return for payment as provided herein.

COMPLETION DATE:

2. The work to be performed under this Agreement shall be commenced by *Month day, year* and fully completed on or before *Month day, year*.

CONTRACT PRICE:

3. The CITY shall pay the CONTRACTOR for the performance of the Agreement the sum of \$XXX

PERFORMANCE BOND:

4. If required by the City, the CONTRACTOR shall furnish to the CITY at the time of the execution of this Agreement a performance bond and a labor and material payment bond each in the amount of *\$Dollar amount* or N/A (whichever applies) executed by a surety company satisfactory to the CITY, guaranteeing the performance and payment by the CONTRACTOR. Yes, Required (Initials: ____) No, Waived (Initials ____)

GUARANTEE:

5. The CONTRACTOR shall guarantee his work against any defects in workmanship and materials for a period of one year from the date of the CITY’s written acceptance of the project.

PERMITS AND LICENSES:

6. Permits and licenses necessary for the prosecution of the work shall be secured and paid by the CONTRACTOR.

CITY’S RIGHT TO TERMINATE CONTRACT:

7. If the CONTRACTOR should be adjudged a bankrupt, or if it should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if it should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, and ordinances, or otherwise be guilty of a substantial violation of any provision of the Agreement, then the CITY when sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the CONTRACTOR, and his surety, seven (7) days written notice, terminate the employment of the CONTRACTOR and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method it may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Agreement price shall exceed the expense of the finishing the work, including compensation for additional architectural, managerial and administrative services, such excess shall be paid to the CONTRACTOR. If such expense shall exceed such unpaid balance, the CONTRACTOR shall pay the difference to the CITY.

CONTRACTOR’S LIABILITY INSURANCE:

8. The CONTRACTOR shall not commence work under this Agreement until he has obtained all insurance required under this paragraph and such insurance has been approved by the CITY, nor shall the CONTRACTOR allow any subcontractor to commence work on his subcontract until all similar insurance required of subcontractor has been so obtained and approved. It is a requirement that the CITY be named as an Additional Insured on the General Liability and Automobile Liability policies.

(a) Commercial General Liability to include products and completed operations, and blanket contractual. The limits of liability shall be as follows:

Bodily Injury and Property Damage	\$1,000,000
Personal Injury and Advertising Injury	\$1,000,000
Per Project Aggregate	\$1,000,000
General Aggregate	\$2,000,000
Products and Completed Operations Aggregate	\$2,000,000
Medical Payments	\$10,000

(b) Business Automobile Liability

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractors to maintain business automobile liability insurance covering all owned, non-owned, leased, rented or hired automobiles (symbol 1). The limits of liability shall be as follows:

Bodily Injury and Property Damage	\$1,000,000
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Automobile physical damage coverage shall be at the option of the CONTRACTOR, all sub-contractors and lower tier contractors. The CITY shall not be liable for physical loss or damage to any owned, non-owned, leased, rented or hired automobile.

(c) Workers' Compensation Insurance

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractor's to maintain Workers' Compensation and Employers Liability in accordance with the laws and regulations of the State of Maine. The limits of liability provided shall be as follows:

Coverage A:	Statutory
Coverage B:	\$100,000/\$500,000/\$100,000

(d) Professional Liability

If the CONTRACTOR is an Architect, Engineer or Surveyor, they shall maintain a policy of insurance to pay on their behalf whatever amounts that may become legally required to pay on account of an error, omission or negligent act.

Limits of Liability shall be as follows:

\$1,000,000 per occurrence and in the aggregate site specific.

It is a requirement that this policy be maintained for a period of three (3) years following completion of the project.

(e) Certificates of Insurance of the types and in the amounts required shall be delivered to the CITY prior to the commencement of any work by the CONTRACTOR, subcontractor or lower tier contractor or any person or entity working at the direction or under control of the CONTRACTOR. The CONTRACTOR shall assume the obligation and responsibility to confirm insurance coverage for all sub-contractors or lower tier contractors who will participate in the project.

(f) The Certificate of Insurance and the policies of insurance shall include a sixty (60) day notice to the CITY of cancellation, non-renewal or material change in coverage or form.

(g) The CONTRACTOR and his surety shall indemnify and save harmless the CITY, his officers and employees from all suits, actions or claims of any character brought because of any injuries or damage received or sustained by any person, persons or property on account of the operations of the said CONTRACTOR; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said CONTRACTOR; or because of any claims or amounts recovered from any infringements or patent trademark, or copyright; or from any claims or amounts arising or recovered under the “Workmen’s Compensation Act” or of any other law, ordinance, order or decree; and so much of the money due to the said CONTRACTOR under and by virtue of his/her contract as shall be considered necessary by the CITY for such purpose, may be retained; or in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the CITY.

(h) Waiver of Subrogation

Payment of any claim or suit including any expenses incurred in connection therewith by the CITY, or any insurance company on behalf of the CITY shall not constitute a waiver of subrogation against the CONTRACTOR, sub-contractors or any lower tier contractor in the event that such claim or suit was caused by or contributed to as a result of the negligent acts of the CONTRACTOR, any sub-contractors or lower tier contractors.

(i) Construction Agreement

The CONTRACTOR shall and does hereby agree to indemnify, save harmless and defend the CITY from the payment of any sum or sums of money to any person whomsoever on account of claims or suits growing out of injuries to persons, including death, or damages to property, caused by the CONTRACTOR, his employees, agents or sub-contractors or in any way attributable to the performance and execution of the work herein contracted for, including (but without limiting the generality of the foregoing), all claims for service, labor performed, materials furnished, provisions and suppliers, injuries to persons or damage to property, liens, garnishments, attachments, claims, suits, costs, attorney’s fees, costs of investigation and defense. It is the intention of this paragraph to hold the CONTRACTOR responsible for the payment of any and all claims, suits, or liens, of any nature character in any way attributable to or asserted against the CITY, or the CITY and the CONTRACTOR, which the City may be required to pay. In the event the liability of the CONTRACTOR shall arise by reason of the sole negligence of the CITY and/or the sole negligence of the CITY’s agents, servants or employees, then and only then, the CONTRACTOR shall not be liable under the provisions of this paragraph.

DAMAGES:

9. The CONTRACTOR shall defend, indemnify and save harmless the CITY and all persons acting for or in behalf of it against all claims for injuries (including death), loss or damage, arising out of the performance out this contract.

LIENS:

10. Neither the final payment nor any part of the retained percentage shall become due until the CONTRACTOR, if required, shall deliver to the CITY a complete release of all liens arising out of the Agreement, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the CONTRACTOR may, if any SUB-CONTRACTOR refuses to furnish a release or receipt in full, furnish a bond satisfactory to the CITY to indemnify it against any lien. If any lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the CITY all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

ASSIGNMENT:

11. Neither party to the Agreement shall assign the Agreement or sublet it as a whole without the written consent of the other, nor shall the CONTRACTOR assign any moneys due or to become due to it hereunder, without the previous written consent of the CITY.

SUBCONTRACTS:

12. The CONTRACTOR shall not sublet any part of this Agreement without the written permission of the CITY. The CONTRACTOR agrees that it is as fully responsible to the CITY for the acts and omissions of its SUB-CONTRACTORS and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

USE OF PREMISES:

13. The CONTRACTOR shall confine its apparatus, the storage of materials and operations of its workers to limits indicated by law, ordinance and permits and shall not otherwise unreasonably encumber the premises with its materials. If any part of the project is completed and ready for use, the CITY may, by written and mutual consent, without prejudice to any of its rights or the rights of the CONTRACTOR, enter in and make use of such completed parts of the project. Such use or occupancy shall in no case be construed as an acceptance of any work or materials.

CLEANING UP:

14. The CONTRACTOR shall at all times keep the premises free from accumulation of waste materials or rubbish caused by its employees or work, and at the completion of the work it shall remove all its rubbish from and about the project, and all its tools, scaffolding and surplus materials and shall leave its work "broom-clean" or its equivalent, unless more exactly specified. In case of dispute, the CITY may remove the rubbish and charge the cost to the CONTRACTOR.

CITY OF AUBURN, MAINE

ENGINE #5 FIRE STATION
ROOF REPLACEMENT PROJECT
651 Center Street, Auburn, Maine

Bid No. 2017-002

Bid Documents

JULY 28, 2016

APPENDIX A

BID SPECIFICATIONS

CITY OF AUBURN, MAINE
ENGINE 5 FIRE STATION
ROOF REPLACEMENT PROJECT

651 Center Street, Auburn, Maine
Bid No. 2017-002



Project Specifications

July 28, 2016

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ADMINISTRATIVE PROVISIONS

PART 1 GENERAL

1.01 CONTRACT REQUIREMENTS

A. Scope of Work

1. The Work of the Contract includes Insulation Upgrade and Roof Replacement at the Engine 5 Fire Station 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: City of Auburn, Maine, Standard Form of Agreement. 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: Not Used

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.
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 September 30, 2016 so that the Owner can have full use of the facility. Final completion of all Work of this Contract shall be by October 21, 2016.

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: dboulangier@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 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 to list change orders, for each application for payment.

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 lighting.

C. Heat, Ventilation

1. The Contractor shall provide source of heating. The Contract 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. Water Control

Not Used

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 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 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.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

- C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from site.

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 matter.**
 - 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 and patching 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.
- 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 SECTION INCLUDES

- A. Selective demolition of roofing related building elements for roof repair purposes.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 07 01 50 – PREPARATION FOR RE-ROOFING

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 SUBMITTALS

- A. Demolition Plan: Submit demolition plan as specified by OSHA, State of Maine 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 NOT USED

PART 3 EXECUTION

3.01 SCOPE

- A. Remove portions of existing buildings in the following sequence:
 - 1. Edge flashing, vent and curb flashing, EPDM roofing, insulation.

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. Provide, erect, and maintain temporary barriers and security devices.
 - 3. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 4. Do not close or obstruct roadways or sidewalks without permit.
 - 5. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.

- D. If hazardous materials are discovered during removal operations, stop work and notify Owner; 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. 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.

3.04 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 41 00

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concealed wood blocking, nailers, and supports.
- B. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING

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.

2.02 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 SYP Pressure Treated.

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.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

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 07 01 50
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal of existing membrane roofing system in preparation for a new membrane roof system.
- B. Temporary protection.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 02 41 00 – DEMOLITION

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meeting: Convene one week before starting work of this section.
- B. Schedule work to coincide with commencement of installation of new roofing system.
- C. The Contractor shall be fully responsible for maintaining the weather-tight integrity of the roofing and wall systems, including permanent and temporary flashings, during the entire construction period.
- D. 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 weather-tight integrity of the roofing and wall systems whether permanent or temporary, at no additional cost to the Owner.
- E. 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. The Owner will determine if damages to lawns are minor or major.

1.04 FIELD CONDITIONS

- A. Do not remove existing roofing membrane when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Maintain continuous temporary protection prior to and during installation of the new roofing system.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.

PART 3 EXECUTION

3.01 PREPARATION

- A. Sweep roof surface clean of loose matter.
- B. Remove loose refuse and dispose of properly off site.

3.02 MATERIAL REMOVAL

- A. Removal of roofing membrane.

3.03 PROTECTION

- A. Provide temporary protective sheeting over uncovered deck surfaces at all times for maintaining weather-tight integrity of the roofing and wall systems, including permanent and temporary flashings, during the entire construction period.
- B. Provide for surface drainage from sheeting to existing drainage facilities.
- C. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.
- D. Do not permit traffic over unprotected or repaired deck surface.

END OF SECTION 07 01 50

SECTION 07 53 00
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Elastomeric roofing membrane, adhered conventional application.
- B. Insulation, flat and tapered.
- C. Flashings.
- D. Roofing cant strips, stack boots and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 06 10 00 – ROUGH CARPENTRY: Wood nailers and curbs.
- E. Section 07 01 50 – PREPARATION FOR RE-ROOFING.
- F. Section 07 62 00 – SHEET METAL FLASHING AND TRIM: Counterflashings and Cladding.

1.03 REFERENCE STANDARDS

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2014.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a (Reapproved 2013).
- D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- E. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2012).
- F. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- G. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2013.
- H. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.
- I. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2011. The project is located in Lewiston, Maine; Basic Wind Speed: 90 MPH; Exposure Factor: C; Importance Factor: 1.
- J. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

- A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, surfacing, and fasteners.
- B. Shop Drawings: Indicate joint or termination detail conditions and conditions of interface with other materials.
- C. Samples for Verification: Submit two samples illustrating insulation.
- D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 100 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.09 WARRANTY

- A. Provide twenty (20) year full system water-tightness, no dollar limit warranty. Warranty shall include wind damage up to 90 MPH per ASCE 7.
- B. Provide five year General Contractor's Watertight Warranty.
- C. Manufacturer's warranties that require periodic inspections or repairs at the Government's expense to maintain the warranty are not permitted.

- D. All roof curbs, flashing and penetration flashings are covered under the warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. EPDM Membrane Materials:
 - 1. Carlisle SynTec: www.carlislesyntec.com
 - 2. Firestone Building Products, LLC: www.firestonebpco.com
 - 3. GenFlex Roofing Systems, LLC: www.genflex.com
 - 4. Johns Manville: www.jm.com
 - 5. Versico Roofing Systems: www.versico.com

2.02 ROOFING - UNBALLASTED APPLICATIONS

- A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over insulation.
- B. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
 - 1. Minimum 2 layers of polyisocyanurate board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637.
 - 1. Thickness: .060 inch.
 - 2. Sheet Width: 76 inch, minimum; factory-fabricate into largest sheets possible.
 - 3. Color: black.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane; conforming to the following:
 - 1. Color: Black.

2.04 INSULATION

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C 1289, Constant thickness insulation, Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 2 and with the following characteristics:
 - 1. Compressive Strength: 20 psi
 - 2. Board Size: 48 x 96 inch.
 - 3. Board Thickness: (Two plies minimum) Thickness per plan.
 - 4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
 - 5. Thermal Resistance: Minimum R-value of 30.
 - 6. Board Edges: Square.
 - 7. Manufacturers:
 - a. Atlas Roofing Corporation: www.atlasroofing.com
 - b. Dow Chemical Co: www.dow.com
 - c. GAF Materials Corporation: www.gaf.com
 - d. Johns Manville: www.jm.com
 - e. Firestone Building Products, LLC: www.firestonebpco.com
 - f. Hunter: www.hunterpanels.com
 - g. Carlisle SynTec: www.carlislesyntec.com
 - h. Firestone Building Products, LLC: www.firestonebpco.com
 - i. GenFlex Roofing Systems, LLC: www.genflex.com

2.05 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
 - 1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
 - 2. Fasteners into treated wood shall be Type 304 or type 316 stainless steel, double hot dipped galvanizing complying with ASTM A153/A153M or other specially treated corrosion-resistant fasteners complying with ASTM A653/A653M, Class G185.
- C. Membrane Adhesive: As recommended by membrane manufacturer.
- D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- E. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- F. Insulation Adhesive: As recommended by insulation manufacturer.
- G. Sealants: As recommended by membrane manufacturer.
- H. Edge Strips: Wood; pressure preservative treated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips are in place.

3.02 VAPOR RETARDER AND INSULATION - UNDER MEMBRANE

- A. Attachment of Insulation:
 - 1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions.
 - 2. Embed second layer of insulation into full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.
- B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
- C. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- E. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.
- F. Do not apply more insulation than can be covered with membrane in same day.

3.03 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate for proper adhesion. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 6 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge. All lap seams shall be fabricated with 6 inch seam tape and stripped-in with self adhering semi-cured EPDM cover strips.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.
- G. Around roof penetrations, seal flanges and flashings with flexible flashing.
- H. Coordinate installation of roof drains and sumps and related flashings.

3.04 FINISHING UNBALLASTED SURFACES

- A. Apply finish membrane flashing to membrane and flashing surfaces exposed to view, in accordance with manufacturer's instructions.

3.05 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 53 00

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings and counter flashings.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 06 10 00 – ROUGH CARPENTRY
- E. Section 07 53 00 – ELASTOMERIC MEMBRANE ROOFING
- F. Section 07 90 05 – JOINT SEALERS

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- 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 D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.04 SUBMITTALS

- A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- B. Warranty: Work of this section shall be included in the warranty of Section 07 53 00 – Elastomeric Membrane Roofing.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual and CDA Copper in Architecture Handbook requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 Gage thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

2. Color: As selected by Owner from manufacturer's standard colors.

2.02 ACCESSORIES

- A. Fasteners:
 1. Galvanized steel, with soft EPDM washers.
 2. All fasteners into treated wood shall be Type 304 or Type 316 stainless steel, double hot dipped galvanized complying with ASTM A153/A153M or other specially treated corrosion-resistant fasteners complying with ASTM A653/A653M, Class G185.
- B. Primer: Zinc chromate type.
- C. Sealant: Type specified in Section 07 90 05.
- D. Plastic Cement: ASTM D4586, Type I.
- E. Underlayment: All treated wood shall be covered with bituminous self-adhesive underlayment.

2.03 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt or synthetic flashings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.

3.02 FIELD QUALITY CONTROL

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 07 62 00

SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured roof specialties, including copings, fascias and roof drains.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 07 53 00 – ELASTOMERIC MEMBRANE ROOFING
- E. Section 07 62 00 – SHEET METAL FLASHING AND TRIM
- F. Section 07 90 05 – JOINT SEALERS
- G. Section 22 11 19 – PLUMBING SPECIALTIES

1.03 REFERENCE STANDARDS

- A. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.
- B. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; Single Ply Roofing Industry; 2003. (ANSI/SPRI ES-1)

1.04 SUBMITTALS

- A. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- B. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Control and Expansion Joint Covers:
 - 1. GAF: www.gaf.com
 - 2. Johns Manville Corporation: www.jm.com
 - 3. MM Systems Corp: www.mmsystemscorp.com
- B. Roof Drains:
 - 1. Refer to Section 22 11 19 Plumbing Specialties.

2.02 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Fascia and edge securement for roof membrane;
 - 2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable code.

- B. Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners.
 - 2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-3 to positive and negative design wind pressure as defined by applicable code.

2.03 ACCESSORIES

- A. Replace all roof drain assemblies with overflow drains with new overflow piping to the building exterior.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions.
- B. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- C. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- D. Coordinate installation of flashing flanges into existing wall.

END OF SECTION 07 71 00

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing including pre-compressed foam sealers.

1.02 RELATED REQUIREMENTS

- A. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
- B. Section 01 35 43 – ENVIRONMENTAL PROTECTION
- C. Section 01 73 29 – CUTTING AND PATCHING
- D. Section 07 53 00 – ELASTOMERIC MEMBRANE ROOFING
- E. Section 07 62 00 – SHEET METAL FLASHING AND TRIM

1.03 REFERENCE STANDARDS

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- C. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- D. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber; 2007.
- E. ASTM D1667 - Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell); 2005 (Reapproved 2011).

1.04 SUBMITTALS

- A. Product Data: Provide product description.
- B. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 FIELD CONDITIONS

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

1.06 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 or watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 SEALANTS

- A. Type A - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.
 - 1. Color: Match adjacent finished surfaces.
 - 2. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.

- d. Other exterior joints for which no other sealant is indicated.
- B. Type B - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
 - 1. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.

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 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.01 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.

3.02 CLEANING

- A. Clean adjacent soiled surfaces.

3.03 PROTECTION

- A. Protect sealants until cured.

END OF SECTION 07 90 05

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Related Sections include the following:
 - 1. Section 01 00 00 – ADMINISTRATIVE PROVISIONS.
 - 2. Section 01 35 43 – ENVIRONMENTAL PROCEDURES.
 - 3. Section 01 73 29 – CUTTING AND PATCHING.
 - 4. Section 22 13 16 – PLUMBING SANITARY AND STORM PIPING.

1.2 SUMMARY

- A. This Section includes hangers and supports for Horizontal Rain Leaders/Overflow piping and equipment.

1.3 SUBMITTALS

- A. Submit product data on all hanger and support devices, including shields and attachment methods. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.

1.4 QUALITY ASSURANCE

- A. Install in accordance with MSS SP69 - Manufacturers Standardization Society: Pipe Hangers and Supports- Selection and Application
- B. Steel pipe hangers and supports shall have the manufacturer's name, part number, and applicable size stamped in the part itself for identification.
- C. Pipe Hangers, Supports, and Components: The materials of all pipe hanging and supporting elements shall be in accordance with MSS SP-58.
- D. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Pipe Hangers and Supports:
 - a. B-Line Systems, Inc.
 - b. Carpenter & Patterson, Inc.
 - c. Grinnell Corp.
 - d. Hubbard Enterprises/Holdrite®
 - e. National Pipe Hanger Corp.
 - f. Piping Technology & Products, Inc.
 - g. Unistrut
 - h. Anvil International, Inc.
 - i. Empire
 - j. Or approved equal

2.2 HANGERS

- A. Hanger “Types” listed below are from Table 1 of MSS SP-69.
- B. The material in contact with the pipe shall be compatible with the piping material so that neither will have a deteriorating action on the other. Provide means of preventing dissimilar metal contact such as plastic coated hangers, copper colored epoxy paint, or non-adhesive isolation tape- B-Line Iso-pipe. Galvanized felt isolators sized for copper tubing may also be used, B-Line B3195CT.
- C. Uninsulated pipes 2 inch and smaller:
1. Type 10: Adjustable steel swivel ring (band type) hanger, B-Line B3170.
 2. Type 10, copper tubing; Adjustable steel swivel ring (band type) hanger, B-Line B3170CT.
 3. Type 5: Adjustable steel swivel J-hanger, B-Line B3690.
 4. Type 12: Malleable iron ring hanger, B-Line B3198R or hinged ring hanger, B3198H.
 5. Type 1: Adjustable steel clevis hanger, B-Line B3100.
 6. Type 1: Adjustable steel clevis hanger, copper piping, B-Line B3104CT.
 7. Type 1 V-Bottom clevis hanger with galvanized 18-gauge continuous support channel, B-Line B3106 and B3106V, to form a continuous support system for flexible plastic pipe (example: PEX) or tubing.
- D. Uninsulated pipes 2-1/2 inch and larger:
1. Type 1: Adjustable steel clevis hanger, B-Line B3100.
 2. Type 41: Pipe roll with sockets, B-Line B3114.

3. Type 43: Adjustable steel yoke pipe roll, B-Line B3110.
- E. Insulated pipe- carrying fluid temperature of 60°F or warmer:
1. 2 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield. Type 1 with Type 40 (B-Line B3151) series insulation protection shield. Anvil International Figure 260 insulation saddle system may be utilized (200°F maximum temperature).
 2. 2-1/2 inch and larger pipes: Adjustable steel yoke pipe roll with pipe covering protection saddle. Type 43 with Type 39 (B-Line B3160 series) pipe covering protection saddles. Pipe roll with sockets with pipe covering protection saddle, Type 41 with Type 39 pipe covering protection saddles.
- F. Insulated pipe- Coldwater piping: Use adjustable steel clevis with galvanized sheet metal shield. Type 1 with Type 40 (B-Line B3151 series) insulation protection shield. Anvil International Figure 260 insulation saddle system may be utilized (200°F maximum temperature).
- G. Shields shall be 180 degree galvanized sheet metal, 18 gauge minimum thickness, designed to match outside diameter of the insulated pipe, B-Line B3151. Refer to Section 22 07 19 “Piping Insulation” for shield and insert lengths.
- H. Pipe Clamps
1. Type 4: When flexibility in the hanger assembly is required due to horizontal movement, use pipe clamps with weld-less eye nuts, B-Line B3140.
 2. Type 3: For insulated lines use double bolted pipe clamps, B-Line B3144.
 3. For copper piping, Type 12: Malleable iron ring hanger, B-Line B3198RCT or hinged ring hanger B3198HCT.
 4. For pipes with Armaflex insulation: The pipe support system shall be of high compressive strength material inserts imbedded in closed-cell elastomeric foam and covered with metal cladding. Pipe clamp assemblies for strut mounting shall consist of B-Line Armafix inserts attached with two-piece pipe clamps such as Cooper B-Line B2000 series clamps. Two-piece pipe clamps shall be provided with pre-installed friction tape and elastic stop nuts.
 5. For vibrating system applications: use a clamp that has a vibration dampening insert and nylon inserted locknut. For copper and steel tubing use B-Line BVT series Vibraclamps, for pipe sizes use BVP series. For insulated piping, use Armafix inserts or similar.
- I. Wall Supports: Pipes 4 inches and smaller: Type 5 J Hanger. B-Line B3690.; pipes larger than 4 inch: Type 32; B-Line B3066.
- J. Floor Supports
1. Hot piping under 6 inch and all cold piping: Carbon steel adjustable pipe saddle and nipple attached to steel base stand sized for pipe elevation. Type 38 B-Line B3093 support and B3088T threaded base stand or Type 37 B3090 and B3088 unthreaded base stand. Pipe saddle shall be screwed or welded to appropriate base stand.

2. Hot piping 6 inch and larger: Adjustable Roller stand with base plate, Type 46 B-Line B3118SL.

K. Vertical Supports

1. Type 8: Steel riser clamp sized to fit outside diameter of pipe, B-Line B3373.
2. Type 8: For supporting vertical runs of copper tubing, use epoxy painted or plastic coated riser clamps, B-Line B3373CT or B3373CTC.
3. For vertical mid-span supports of piping 4" and under, use Hubbard Enterprises/Holdrite Stout Brackets™ with Hubbard Enterprises/Holdrite Stout Clamps or two-hole pipe clamps (MSS Type 26) or B-Line B-3180.

2.3 UPPER ATTACHMENTS

A. Beam Clamps

1. Beam clamps shall be used where piping is to be suspended from building steel. Clamp type shall be selected on the basis of load to be supported, and load configuration.
2. Type 23 C-Clamps shall have locknuts and cup point set screws, B-Line B351L, or B3036L.
3. Type 19 Top flange c-clamps shall be used when attaching a hanger rod to the top flange of structural shapes, B-Line B3034 or B3033.
4. Refer to manufacturer's recommendation for setscrew torque.
5. Retaining straps shall be used to maintain the clamps position on the beam where required.

2.4 ACCESSORIES

- A. Hanger Rods shall be threaded both-ends, or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.
- B. Pipe protection saddles shall be formed from carbon steel, 1/8 inch minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 inch shall have a center support rib.
- C. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars, black and galvanized.
- D. Design and fabricate supports using structural quality steel bolted framing materials as manufactured by Cooper B-Line. Channels shall be roll formed, 12 gauge ASTM A1011 SS Grade 33 steel, 1-5/8 inch by 1-5/8 inch or greater as required by loading conditions. Submit designs for pipe tunnels, pipe galleries, etc., to engineer for approval. Use clamps and fittings designed for use with the strut system.

2.5 FINISHES

A. Indoor Finishes

1. Hangers and clamps for support of bare copper piping shall be coated with copper colored epoxy paint, B-Line Dura-Copper®. Additional PVC coating of the epoxy painted hanger shall be used where necessary.
2. Hangers for other than bare copper pipe shall be zinc plated in accordance with ASTM B633 OR shall have an electro-deposited green epoxy finish, B-Line Dura-Green®.
3. Strut channels shall be pre-galvanized in accordance with ASTM A653 SS Grade 33 G90 OR have an electro-deposited green epoxy finish, B-Line Dura-Green®.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger requirements are specified in Sections specifying equipment and systems. Hangers shall be as recommended by manufacturer of piping.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.
- C. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- D. Support of pipe, tubing and equipment shall be accomplished by means of engineered products, specific to each application. Makeshift, field devised methods shall not be allowed.

3.2 HANGER SPACING

- A. Support piping and tubing not listed below according to MSS SP-69 and manufacturer's written instructions.
- B. Piping Hangers for Plastic Piping:
 1. Space hangers according to pipe manufacturer's written instructions for service conditions. Avoid point loading. Space and install hangers with the fewest practical rigid anchor points.
 2. In systems where large fluctuations in temperature occur, allowances must be made for expansion and contraction of the piping system. Since changes in direction in the system are usually sufficient to allow for expansion and contraction, hangers must be placed so as not to restrict this movement.
 3. Hangers shall not compress, distort, cut or abrade the piping. All piping shall be supported at intervals sufficiently close to maintain correct pipe alignment and to prevent sagging or grade reversal. Pipe should also be supported at all branch ends and at all changes of direction.

4. Install hangers for piping with the following maximum horizontal spacing and minimum rod diameters (pipe temperature 100°F or lower).
 - a. NPS 1 and smaller: 4 feet with 3/8-inch rod.
 - b. NPS 1-1/4 and 1-1/2 and NPS 2: 5 feet with 3/8-inch rod.
 - c. NPS 3: 6 feet with 1/2-inch rod.
 - d. NPS 4: 6.5 feet with 5/8-inch rod.
 - e. NPS 6 and 8: 8 feet with 3/4-inch rod.
 5. Install supports for vertical piping every 10 feet.
- C. Support vertical piping independently of connected horizontal piping. Support vertical pipes at base and at every floor. Wherever possible, locate riser clamps directly below pipe couplings or shear lugs.
- D. Place a hanger within 12 inches of each horizontal elbow.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Pipe Hanger and Support 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.
- B. Install building attachments within concrete slabs or attach to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, and expansion joints, and at changes in direction of piping.
- C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- D. 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.
- E. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- F. Pipe Slopes: As per local code. Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.
- G. Install hangers to provide a minimum of 1/2-inch space between finished covering and adjacent work.
- H. Do not support piping from other pipes, ductwork or other equipment that is not building structure.

3.4 METAL FABRICATION

- A. All attachments welded to the pipe shall be in accordance with MSS SP-58 and Pipe Fabrication Institute Standard ES-26.
- 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.

3.5 ADJUSTING

- A. Adjust hangers and supports to distribute loads equally on attachments and to achieve indicated slope of pipe. Ensure that rods are vertical under operating conditions. Equalize loads. Tighten all nuts and screws after adjustment.
- B. Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to flange of beam.

3.6 PAINTING

- A. Touching Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780. `

END OF SECTION 22 05 29

SECTION 22 07 19
PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Piping insulation.
 - 2. Insulation jackets.
- B. Related Documents:
 - 1. Section 01 00 00 – ADMINISTRATIVE PROVISIONS
 - 2. Section 01 35 43 – ENVIRONMENTAL PROTECTION
 - 3. Section 01 73 29 – CUTTING AND PATCHING
 - 4. Section 22 13 16 – PLUMBING SANITARY AND STORM PIPING

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM C177 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - 3. ASTM C335 - Steady-State Heat Transfer Properties of Horizontal Pipe Insulation.
 - 4. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 5. ASTM C534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - 6. ASTM C547 - Mineral Fiber Pipe Insulation.
 - 7. ASTM C553 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - 8. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation.
 - 9. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
 - 10. ASTM E84 - Surface Burning Characteristics of Building Materials.
 - 11. ASTM E96 - Water Vapor Transmission of Materials.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
 - 1. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- D. Underwriters Laboratories, Inc. (UL):

1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Submittal Procedures: Procedures for submittals.

1. Product Data:

- a. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.4 QUALITY ASSURANCE

- A. Qualifications:

1. Manufacturer: Company specializing in manufacturing Products specified with minimum 3 years documented experience.
2. Installer: Company specializing in performing the Work of this Section with minimum 3 years documented experience.

- B. Materials:

1. Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84, NFPA 255 and UL 723.
2. Insulation for duct, pipe and equipment for above grade exposed to weather outside building shall be certified as being self-extinguishing for 1 inch thickness less than 53 seconds when tested in accordance with ASTM D1692.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Product Requirements: Transport, handle, store, and protect Products.
- B. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic.
- D. Protect insulation against dirt, water, chemical, and mechanical damage.

1.6 PROJECT CONDITIONS OR SITE CONDITIONS

- A. Jobsite Requirements

1. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
2. Maintain temperature during and after installation for minimum period of 24 hours.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Energy efficiency:

1. Insulation: Minimum thickness in accordance with ASHRAE 90.1. Provide additional thickness to ensure surface temperatures are below 100 degrees and to prevent condensation on cold surfaces.

PART 2 - PRODUCTS

2.1 PIPING INSULATION

A. Glass Fiber

1. Manufacturers:
 - a. CertainTeed Insulation, Valley Forge, PA (800) 233-8990.
 - b. Other acceptable manufacturers offering equivalent products:
 - 1) Knauf Fiber Glass.
 - 2) Manville Insulation, Inc.
 - 3) Owens-Corning Fiberglass.
 - 4) Or approved equal.
2. Insulation: ASTM C547; rigid molded, noncombustible.
 - a. 'K' ('ksi') value : ASTM C335, 0.24 at 75 degrees F.
 - b. Minimum Service Temperature: -20 degrees F.
 - c. Maximum Service Temperature: 300 degrees F.
 - d. Maximum Moisture Absorption: 0.2 percent by volume.
3. Vapor Barrier Jacket
 - a. ASTM C921, White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - b. Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.
 - c. Secure with self sealing longitudinal laps and butt strips.
 - d. Secure with vapor barrier mastic.
4. Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch centers.
5. For insulation outdoors, provide stainless steel jacket, bonded, overlapped, screwed with pop rivets or screws, and sealant placed on joints as per manufacturer's recommendation for a water-tight joint.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Execution: Verification of existing conditions before starting work.
- B. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
 1. Verify that piping has been tested before applying insulation materials.
 2. Verify that ductwork has been tested before applying insulation materials.
 3. Verify that surfaces are clean, foreign material removed, and dry.
- C. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

- D. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the United States Postal Service.

3.2 **INSTALLATION - PIPING INSULATION**

- A. Install materials in accordance with manufacturer's instructions and ASHRAE 90.1.
- B. On exposed piping, locate insulation and cover seams in least visible locations.
- C. Insulated dual temperature pipes or cold pipes conveying fluids below ambient temperature:
 - 1. Provide vapor barrier jackets, factory applied or field applied.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe.
 - 3. PVC fitting covers may be used.
 - 4. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
 - 5. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. For insulated pipes conveying fluids above ambient temperature:
 - 1. Provide standard jackets, with or without vapor barrier, factory applied or field applied.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.
 - 3. Finish with glass cloth and adhesive.
 - 4. PVC fitting covers may be used.
 - 5. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
 - 6. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- E. Inserts and Shields:
 - 1. Application: Piping 3 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert Location: Between support shield and piping and under the finish jacket.
 - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- F. Finish insulation at supports, protrusions, and interruptions.
- G. For pipe exposed in mechanical equipment rooms or in finished spaces finish with manufacturer's standard all-service jacket for fiberglass pipe. No jacket required for elastomeric foam insulation.
- H. For exterior applications, provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- I. For buried piping, use elastomeric foam insulation only.

- J. For heat traced piping, insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.3 CONSTRUCTION

- A. Substituted insulation materials shall provide thermal resistance within 10 percent at normal conditions, as materials indicated.

3.4 PIPING INSULATION SCHEDULE

- A. Glass Fiber Insulation Schedule:

PIPING SYSTEMS	PIPE SIZE	THICKNESS
	Inch	Inch
Plumbing Systems:		
Horizontal Rain Leaders/Overflow - Above Grade	All	1"

END OF SECTION 22 07 19

SECTION 22 11 19
PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Related Sections include the following:
 - 1. Section 01 00 00 – ADMINISTRATIVE PROVISIONS.
 - 2. Section 01 35 43 – ENVIRONMENTAL PROCEDURES.
 - 3. Section 01 73 29 – CUTTING AND PATCHING.

1.2 SUMMARY

- A. This Section includes plumbing specialties.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Storm Drainage Piping: 10-foot head of water.

1.4 SUBMITTALS

- A. Product Data: Include rated capacities and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections.
- B. Field test reports.
- C. Maintenance Data: For plumbing specialties to include in maintenance manuals. Include the following:

1.5 QUALITY ASSURANCE

- A. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.
- B. 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.
- C. Comply with Maine State Internal Plumbing Code.
- D. Comply with local building and plumbing codes.
- E. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for piping materials and installation.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Manufacturers:
 - 1. Zurn.
 - 2. Smith, Jay R. Mfg. Co.
 - 3. Josam Co.
 - 4. Tyler Pipe, Wade Div.
 - 5. Watts Industries, Inc., Drainage Products Div.
 - 6. Mifab.
 - 7. Or approved equal.
- B. Cleanouts shall be easily accessible and shall be gastight and watertight. Provide a minimum clearance of 24 inches for the rodding. Size of cleanout shall be same as pipe size through 4". Pipes 4" and larger shall have 4" cleanouts.
- C. Cleanouts shall consist of "Y" fittings and (1/8 inch) bends with brass or bronze screw plugs.
- D. Provide cleanouts at or near the base of the vertical stacks with the cleanout plug located approximately 24 inches above the floor. If there are no fixtures installed on the lowest floor, the cleanout shall be installed at the base of the stack Cleanout shall consist of sanitary tees. . Extend the cleanouts to the wall access cover; Mifab 1400 Series.
- E. In horizontal runs above grade, cleanouts shall consist of cast brass tapered screw plug in fitting or caulked/no hub cast iron ferrule. Plain end (no-hub) piping in interstitial space or above ceiling may use plain end (no-hub) blind plug and clamp.

2.2 ROOF DRAINS

- A. Roof Drains: Comply with ASME A112.21.2M.
- B. Manufacturers:
 - 1. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
 - a. Josam, Michigan City, IN (219) 872-5531.
 - b. Jay R. Smith Manufacturing Company, Montgomery, AL (334) 277-8520.
 - c. Froet Industries LLC Sterling Illinois (815)-626-7922.
 - d. Or approved equal.
 - 2. Product Requirements: Product options and substitutions. Substitutions: Permitted.
 - 3. Roof Drain Schedule:
 - a. Overflow Roof Drain
 - 1) Overflow Roof Drain:
 - 2) See drawings for detail of sump receiver and drain installation.
 - 3) Manufacturer: Froet Drain Bi-functional roof drain 100C4ULP-OFS, DMP, DC and DEX as required. Or approved equal.

- 4) Dual Outlets:
 - a) Primary Drain Outlet: Attached to storm piping
 - b) Overflow Drain Outlet: Attached to new piping to relieve area outside of building, separate from primary drain system.
 - 5) Compliance:
 - a) ANSI/ASME A112.6.4.
 - b) IAPMO IGC 187.
 - c) ICC-ES LC 1021.
 - 6) Body:
 - a) Bi-functional.
 - b) Cast Iron: ASTM A 48, Class 25.
 - c) Anchor flange.
 - d) Powder coated.
 - 7) Dome Strainer:
 - a) Cast Iron: ASTM A 48, Class 25.
 - b) Minimum Free Area: 136 square inches.
 - 8) Waterproofing Membrane Clamp Ring:
 - a) Width: 2.375 inches
 - b) Cast Iron: ASTM A 48, Class 25.
 - c) Integral Gravel Stop: 1-1/4-inch height minimum.
 - 9) Pipe Size: As shown on plans.
- b. Roof Drain Replacement Insert
- 1) Retrofit Drain Inserts
 - 2) See drawings for detail of installation
 - 3) Manufacturer: Marathon Roofing Products.

2.3 DOWNSPOUT COVER

- A. Manufacturers:
1. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
 - a. Zurn
 - b. Watts
 - c. Substitutions will be considered for approval
- B. Furnish and install Zurn Z199-DC or Watts RD-950 downspout cover at secondary drainage piping outlets.
- C. Options:
1. Type 304 Stainless Steel
 2. Adapt to PVC piping system.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Roof Drains:

1. Coordination:
 - a. Roof drains installed and flashed by roofing contractor.
 - b. Roof drains furnished, insulated, and connected to piping by Division 22.
 2. Examine areas to receive roof drains. Notify the Owners Representative of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.
 3. Install roof drains in accordance with manufacturer's instructions at locations indicated on the drawings.
 4. Install roof drains plumb, level, and to correct elevation.
 5. Install roof drains using manufacturer's supplied hardware.
 6. Protect installed roof drains from damage during construction.
- B. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Connect plumbing specialties to piping specified in other Division 22 Sections.

3.3 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 11 19

SECTION 22 13 16

PLUMBING SANITARY AND STORM PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections include the following:
 - 1. Section 01 00 00 – ADMINISTRATIVE PROVISIONS.
 - 2. Section 01 35 43 – ENVIRONMENTAL PROCEDURES.
 - 3. Section 01 73 29 – CUTTING AND PATCHING.
 - 4. Section 22 05 29 – HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT.
 - 5. Section 22 07 19 – PIPING INSULATION.
 - 6. Section 22 11 19 – PLUMBING SPECIALTIES.

1.2 SUMMARY

- A. This Section includes soil and waste, sanitary drainage and vent piping inside the building and to locations indicated.
- B. This Section includes storm-drainage piping inside the building and to locations indicated.
- C. Drawings show the general layout of piping and accessories but do not show all required fittings and offsets that may be necessary to connect piping to equipment and to coordinate with other trades. Fabricate piping based on field measurements. Provide all necessary fittings and offsets.

1.3 PERFORMANCE REQUIREMENTS

- A. Comply with the utility requirements for the connection of to the municipal utility services. Obtain and pay for all necessary permits from the applicable municipal department. Obtain authority to connect to their existing mains.
- B. Provide components and installation capable of producing piping systems with working-pressure ratings per local plumbing code.

1.4 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with the UPC 2009 edition, subject to the exclusions and amendments set forth by the Maine Plumbers Examining Board.
- C. Comply with local building and plumbing codes.
- D. 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 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.2 PVC DRAINAGE PIPING

- A. Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D-1784 and conform with National Sanitation Foundation (NSF) standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM D-1785 and ASTM D-2665. Fittings shall conform to ASTM D-2665.
- B. All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer's recommendations and local code requirements. Solvent cements shall conform to ASTM D-2564, primer shall conform to ASTM F-656. The system to be manufactured by Charlotte Pipe and Foundry Co. or approved equal; and shall be intended for non-pressure drainage applications where the temperature will not exceed 140°F.

2.3 FIRESTOP PROTECTION FOR DWV AND STORMWATER PIPING

- A. All piping penetrations of fire-resistant rated construction shall be protected in accordance with the plumbing code.
- B. Use ProSet, or approved equal, "Firestop Penetrators", Warnock Hersey classified and listed in the building materials directory.
- C. Products shall be tested in accordance with the ASTM E-814 standards and shall be selected for all applicable pipe penetrations and plumbing fixture floor openings through Fire-Rated floors, walls or floor/ceiling assemblies, in accordance with the Manufacturer's instructions.
 - 1. Use ProSet System "B" penetrators for cast iron DWV pipes for stacks and drains penetrating floors and walls.

2. Use ProSet System "C" penetrators for plastic DWV pipes for stacks and drains penetrating floors and walls

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground pressure piping, unless otherwise indicated.
- C. Storm Drain Piping:
 1. Schedule 40 PVC DWV

3.2 PIPING INSTALLATION

- A. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- 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. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Hanger, support, and anchor devices are specified in Division 22 Section "Hangers and Supports."

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials. Connect storm drainage piping to roof drains and storm drainage specialties.

3.5 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. Test 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 piping 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.
- C. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.
- D. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

3.6 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

CITY OF AUBURN, MAINE

**ENGINE #5 FIRE STATION
ROOF REPLACEMENT PROJECT
651 Center Street, Auburn, Maine**

Bid No. 2017-002

Bid Documents

JULY 28, 2016

APPENDIX B

BID DRAWINGS

CITY OF AUBURN, MAINE

ENGINE NO. 5 FIRE STATION
ROOF REPLACEMENT PROJECT

651 Center Street, Auburn, Maine
Bid No. 2017-002

Bid Documents

July 28, 2016



Camden, ME | Portland, ME | York, ME
207.236.9970 | www.cordjiacapitalprojects.com

Drawing List

- COVER SHEET
- A1-1 ROOF PLAN AND DETAILS

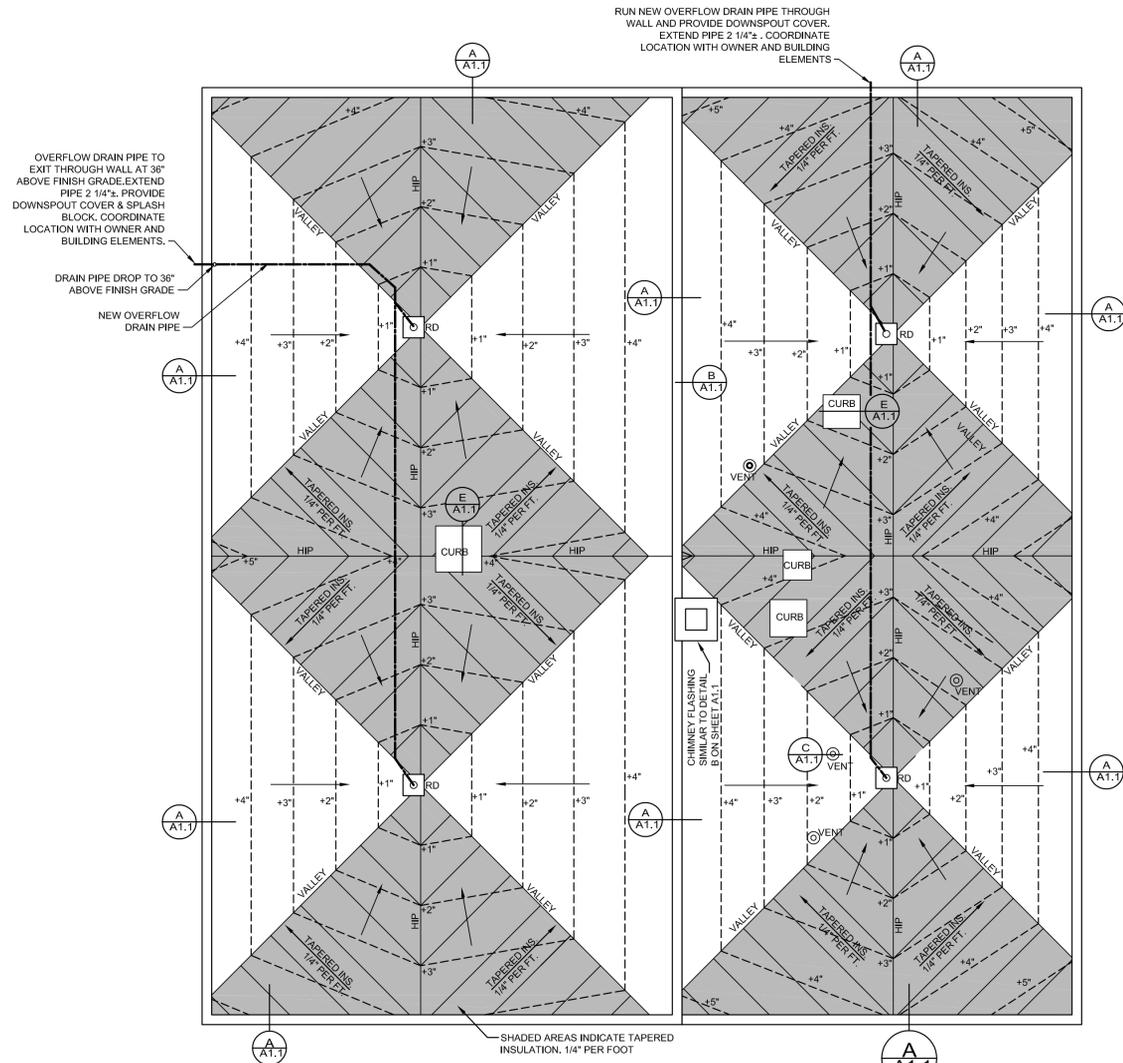


Location Map
No Scale



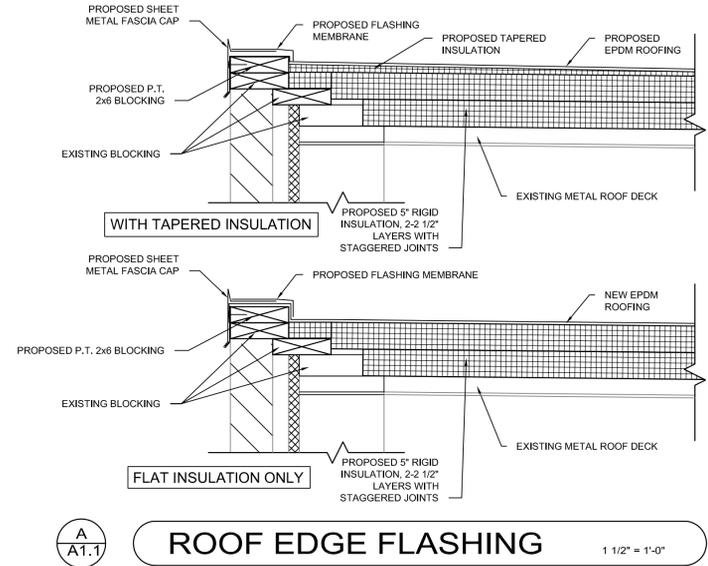
GENERAL NOTES

- CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD. CONTRACTOR SHALL REPORT ANY CONDITION THAT IS NOT AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND THOROUGH UNDERSTANDING OF ALL DRAWINGS AND SPECIFICATIONS. CONTRACTOR MUST REPORT ALL CONFLICTS BETWEEN SEPARATE ADJACENT TRADES PRIOR TO THE INSTALLATION OF ANY CONFLICTING WORK.
- ALL GENERAL NOTES APPLY UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- COORDINATE STAGING AREAS WITH OWNER AND ANY OTHER CONTRACTORS EMPLOYED BY THE OWNER PRIOR TO COMMENCEMENT OF WORK.
- DRAWINGS ARE PREPARED TO SCALE UNLESS NOTED NTS (NOT TO SCALE).
- WORK SHALL BE DONE IN COMPLIANCE WITH CURRENTLY ADOPTED VERSIONS OF THE MAINE UNIFORM BUILDING AND ENERGY CODE (MUBEC) AND NFPA 101.
- THE CONTRACTOR SHALL VISIT THE SITE AT A DESIGNATED TIME, APPROVED BY THE OWNER, TO VERIFY EXISTING CONDITIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK TO BE DONE BY SUBCONTRACTORS.
- WORK SHALL BE COMPLETED IN COMPLIANCE WITH INDUSTRY STANDARDS AND PERFORMED IN A WORKMAN LIKE AND PROFESSIONAL MANNER. PROVIDE ALL FLASHING DETAILS IN ACCORDANCE WITH SYSTEM MANUFACTURER.
- THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING ITEMS DAMAGED BY NEW CONSTRUCTION, AND ANY INCIDENTAL REPAIRS OF EXISTING FINISHED SURFACES DISTURBED BY NEW CONSTRUCTION. SUCH REPAIRS SHALL MATCH THE EXISTING TO THE OWNERS SATISFACTION.
- THE CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS DURING ROOF REPLACEMENT, REMOVAL OF WASTE MATERIALS, SAFETY PRECAUTIONS, AND SANITARY PROVISIONS FOR EMPLOYEES AND SUBCONTRACTORS AS REQUIRED FOR THE DURATION OF THE CONTRACT.
- ANY REPLACED METAL ROOF DECKING OR METAL ROOF DECKING PATCHES TO MATCH EXISTING. ATTACH REPLACEMENT PANEL PER MANUFACTURER'S RECOMMENDATIONS. ASSUME EXISTING ROOF DECK TO BE 1 1/2", 22 GAUGE, TYPE B, DOUBLE SPAN MIN. FIELD VERIFY BEFORE ORDERING.
- CONTRACTOR IS RESPONSIBLE FOR DAILY CLEAN UP. SITE TO BE KEPT CLEAR OF CONSTRUCTION DEBRIS. AT THE END OF EACH WORK DAY THE CONTRACTOR SHALL LEAVE THE WORK AREA IN A SAFE, SECURE, WEATHERTIGHT AND NEAT MANNER
- AT NO TIME SHALL CONSTRUCTION MATERIALS/DEBRIS EXIT THE WORK AREA.
- CONTRACTOR TO PROVIDE A FALL PROTECTION PLAN AS A SUBMITTAL.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF EQUIPMENT AND MATERIALS ON SITE.
- PROTECT AND MAINTAIN WEATHER TIGHT.
- ALL TREATED WOOD SHALL BE COVERED WITH APPROVED BITUMINOUS SELF-ADHESIVE UNDERLAYMENT. ALL FASTENERS INTO TREATED WOOD SHALL BE GALVANIZED OR STAINLESS STEEL.

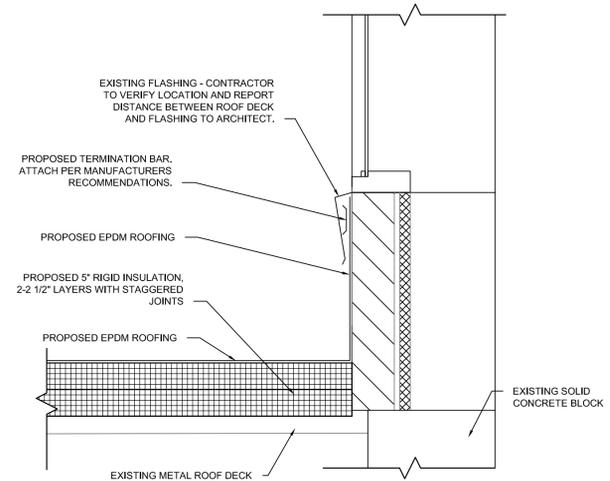


ROOF PLAN 1/8" = 1'-0"

NOTE:
EL. 0 IS TOP OF FLAT INSULATION AT LOW POINT.

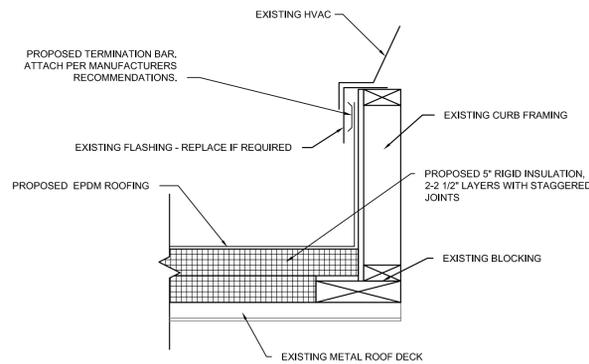


ROOF EDGE FLASHING 1 1/2" = 1'-0"

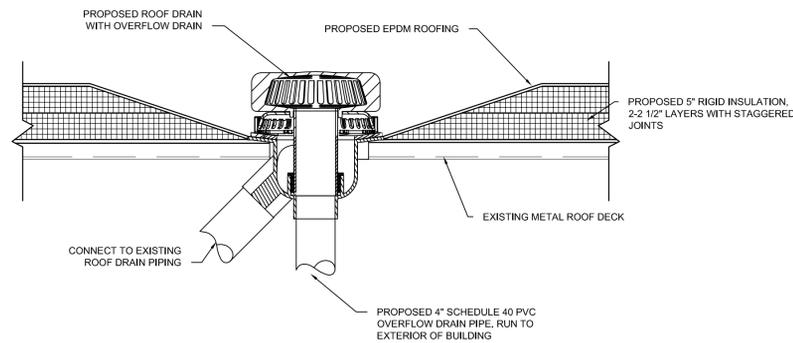


FLASHING DETAIL 1 1/2" = 1'-0"

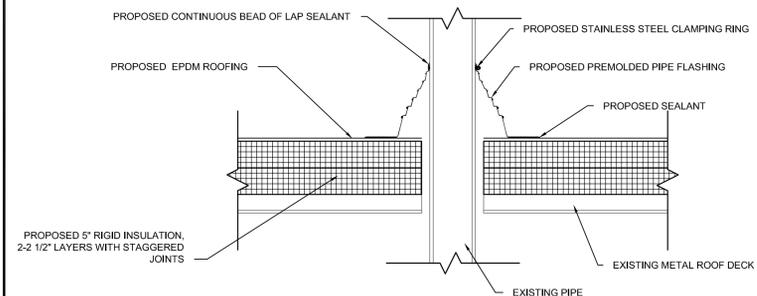
NOTE: DETAIL IS AT WINDOW LOCATION. DETAIL AT NON WINDOW LOCATION IS SIMILAR.



HVAC CURB FLASHING DETAIL 1 1/2" = 1'-0"



ROOF DRAIN 1 1/2" = 1'-0"



VENT STACK DETAIL 1 1/2" = 1'-0"

Project:
ENGINE #5 FIRE STATION ROOF REPLACEMENT PROJECT
651 Center Street Auburn, Maine
Bid No. 2017-002

Client:
City of Auburn, Maine
60 Court Street
AUBURN, MAINE 04210

Legend:

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Consultant Name and Address:
ARCHITECT
JOHN E. HANSEN, ARCHITECT
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- Drawing Status:
- CONCEPT DESIGN
 - 65% DESIGN DEVELOPMENT
 - 100% DESIGN DEVELOPMENT
 - BID DOCUMENT
 - RECORD DOCUMENT
- NO DRAWING SHALL BE RECOGNIZED AS A CONSTRUCTION DOCUMENT UNLESS IT BEARS A SIGNED REGISTRATION SEAL.

ROOF PLAN & DETAILS

No.	Revision/Issue	Date

Design by: JEH Checked by: MAD
Drawn by: CMC Approved by: BMB
Project #994 Date: JULY 28, 2016

Sheet Number:
A1-1