Project Manual & Specifications

Citizens Block Entrance Addtion - Exterior Shell

Town of Vernon Contract # 2076

Rehabilitation of the Citizens Block
28 - 34 Park Place
Vernon, Connecticut

March 17, 2021

THE ARCHITECTS

Robert B. Hurd, AIA

56 Arbor Street, Suite 403, Hartford, CT 06106 Phone: (860) 232-2707

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PROJECT DIRECTORY

PROJECT:	Citizens Block - Entrance Addition Exterior Shell 28 – 34 Park Place Vernon, CT 06066
OWNER:	Town of Vernon Memorial Building 14 Park Place Vernon, CT 06066 Phone: 860-870-3599
ARCHITECT of RECORD:	THE ARCHITECTS 56 Arbor Street Suite 403 Hartford, CT 06106 Phone: 860-232-2707
ASSOCIATE ARCHITECT:	Crosskey Architects LLC 750 Main Street Suite 150 Hartford, CT 06103 Phone: 860-724-3000
CIVIL ENGINEER:	Design Professionals Inc. 21 Jeffrey Drive PO Box 1167 South Windsor, CT 06074 Phone: 860-291-8755
STRUCTURAL ENGINEER:	Cirrus Structural Engineering, LLC 19 Lower Woodland Terrace Columbia, CT 06237 Phone: 860-337-0200

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INVITATION TO BID

Notice to Bidders: Bidders may submit bids for the Entrance Addition – Exterior Shell for the Citizens Block located at 28-34 Park Place in Vernon, CT as described in the following Invitation to Bid.

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INVITATION TO BID

LEGAL NOTICE
TOWN OF VERNON
CONTRACT # 2076
CITIZENS BLOCK ENTRANCE ADDITION – EXTERIOR SHELL
28 – 34 PARK PLACE, VERNON, CT

The Town of Vernon, Connecticut is seeking qualified, licensed contractors for the construction of the entrance addition exterior shell and associated interior construction at the Citizen's Block, 28-34 Park Place, Vernon, Connecticut. A firm must have demonstrated experience in providing such service and adhere to standards and requirements typical for such service. Further, all bidders must have demonstrated experience with projects in which the Secretary of the Interior's Standards for the Treatment of Historic Buildings governed the work.

There will be a mandatory walk-through at the project site, 28-34 Park Place, Vernon, CT on Wednesday, March 24, 2021 at 10:00 AM. COVID-19 guidelines and protocols will be in full affect requiring social distancing and face masks.

A certified check or bid bond in the amount of five percent (5%) of the total bid and insurance certificates must accompany each proposal. Electronic copies of the RFP are available online at the Connecticut State Department of Administrative Services website at https://portal.ct.gov/DAS or on the Town of Vernon website at http://www.vernon-ct.gov/legal-notices with reference to Contract # 2076. Contract document drawings and specifications will be available in the "Public Jobs" plan room at the Reprostore, 37 Airport Road, Hartford, CT 06114, (860) 296-0374, www.reprostoreplanroom.com.

All questions about the project should be directed by e-mail only to Dwight Ryniewicz, Director of Public Works, at dryniewicz@vernon-ct.gov, with a copy to Michael J. Purcaro, Town Administrator, by e-mail at mpurcaro@vernon-ct.gov, no later than 3:30 PM on April 14, 2021. Answers to all received questions shall be posted by April 16, 2021 on the Town's website under the bid section at https://www.vernon-ct.gov/government/bids-and-contracts with reference to Contract # 2076.

Three (3) copies of all proposals should be submitted in a sealed envelope, with "**BID DOCUMENT – DO NOT OPEN – CONTRACT # 2076**" clearly marked on the outside of the envelope, to: Michael J. Purcaro, Town Administrator, Town of Vernon, Memorial Building, 14 Park Place, 3rd Floor, Vernon, Connecticut 06066 by **11:00 AM on Thursday, April 22, 2021**. Proposals shall be opened and read aloud publicly via Zoom web conference at 2:00 PM. The public bid opening is accessible by internet at https://us02web.zoom.us/j/81112426612?pwd=eDFhY3NMcXkvUjg2QytxdGpKeXZXQT09 or by phone at 1 (929) 205-6099, **Meeting ID**: 811 1242 6612 and **Passcode:** 0323. E-mailed faxed or late bids will not be accepted.

The selected firm must meet all municipal, state and federal AA and EEO practices and requirements. MBEs/WBEs/SBEs are encouraged to submit a bid. The Town reserves the right to reject any or all proposals in whole or part, to award any one service or group of services or all services, to negotiate with any or all companies submitting proposals, and to enter into an agreement with any company for any services mentioned in this RFP; if it is deemed to be in the best interest of the Town.

Confidentiality: If Respondent believes that any information in its proposal should be treated as confidential, that material shall be clearly marked. The Town shall endeavor to protect confidential materials from disclosure to non-Town employees to the extent required by State or Federal law. In no event will the Town be responsible for the inadvertent disclosure of your response to this RFP.

Michael J. Purcaro
Town Administrator

END OF SECTION

INSTRUCTIONS TO BIDDERS

1.1 GENERAL INSTRUCTIONS

These instructions are standard for all proposals issued by the Town of Vernon, Connecticut for the purchase of all supplies, materials, equipment and the furnishing of certain services. The Town may delete, supersede or modify any of these standard instructions for a particular proposal by indicating such change in a section entitled "Special Instructions to Bidders".

1) The attached proposal is signed by the bidder with full knowledge of, and agreement with, the general specifications, conditions and requirements of this bid.

2) Proposals must be submitted on the enclosed form with any required bid security.

3) Bids shall be submitted in sealed envelopes, which shall be addressed to the Town Administrator, 14 Park Place, Vernon, Connecticut 06066 and shall be clearly marked "**BID DOCUMENT - DO NOT OPEN - CONTRACT # 2076**".

4) Bids received later than the time and date specified in the "Invitation to Bid" will not be considered. Withdrawals of bids, received later than the time and date set for the bid opening, will not be considered.

5) All deliveries of commodities hereunder shall comply in every respect with all applicable laws of the Federal Government and the State of Connecticut.

6) The bidder shall insert the price per stated unit and extend a total price for each item. IN THE EVENT THAT THERE IS A DISCREPANCY BETWEEN THE UNIT PRICE AND THE TOTAL PRICE EXTENSION, THE UNIT PRICE WILL GOVERN.

7) In accordance with the provisions of Section 12-412(a) of the Connecticut General Statutes, the Town of Vernon is exempt from the payment of Federal or State tax and such tax or taxes shall not be included in bid prices.

8) Unless otherwise stated herein, all deliveries made under this contract must consist of new merchandise.

9) The Town reserves the right to reject any and all bids, wholly or in part; to waive technical defects, and to make awards in the manner deemed to be in the best interests of the Town.

10) The Town will not accept any additional charges for freight or shipping.

11) The successful bidder must carry Workers' Compensation Insurance, a minimum of $2,000,000, Bodily Injury Liability Insurance, a minimum of $2,000,000 Property Liability Insurance and a minimum motor vehicle liability insurance in the amount of $2,000,000 Single Limit, or comparable coverage's.

12) All bids must be accompanied by bid security in the sum of not less than five percent (5%) of the total bid and shall be in the form of a bid bond, a certified check, a treasurer's or cashier's check drawn on a National or State bank or trust company and shall be made payable to the "Town of Vernon".

The bid security shall secure the execution of the contract by the successful bidder.

Should any bidder to whom an award is made fail to enter into a contract within ten (10) days, exclusive of Saturdays, Sundays and legal holidays, after notice of the award has been mailed to the bidder, the amount so received from the bidder through his/her bond shall become the property of the Town of Vernon, Connecticut as liquidated damages for failure.

The bid security, exclusive of the successful bidder, will be returned upon execution of the contract, but in no case later than forty-five (45) days after the opening of the bids.

The bid security of the successful bidder shall be held until such time as all conditions of the proposal have been met.

1.2 SPECIAL INSTRUCTIONS TO BIDDERS

1) Read all specifications carefully.

2) All insurance documents must be submitted with the executed contract. Town of Vernon must be listed as Certificate Holder and Additional Insured.

3) Deviations: Any and all deletions, variations and exceptions to the specifications must be stated in writing at time of bidding and must be attached to the "Proposal" section of contract.

4) Not responsible for defects to electronically-mailed contracts.

5) This project will be funded from Town of Vernon resources. The work will be subject to State Prevailing Wages. A copy of the current wage rates will be provided to all prospective bidders.

6) All bidders must have demonstrated experience with projects in which the Secretary of the Interior's Standards for the Treatment of Historic Buildings governed the work.

7) **Attendance at the pre-bid site meeting is mandatory. Failure to attend will disqualify a prospective bidder**.

END OF SECTION

BID FORM

Notice to Bidders: Bidders are to submit bids for the Entrance Addition – Exterior Shell for the Citizens Block located at 28-34 Park Place in Vernon, CT on the following Bid Form. Failure to comply will disquaily a prospective bidder.

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BID FORM

TOWN OF VERNON
CONTRACT # 2076
CITIZENS BLOCK ENTRANCE ADDITION – EXTERIOR SHELL
28 – 34 PARK PLACE, VERNON, CT

TO: Town of Vernon
Memorial Building
14 Park Place
Vernon, CT 06066

Sirs:

THE UNDERSIGNED HEREBY DECLARES that:

A. No person or persons other than those named herein are interested in this Proposal or in the Contract proposed to be taken; that it is made without any connection with any other person or persons making any proposal for the same work, and is in all respects fair and without collusion or fraud; that no person acting for or employed by the Town of Vernon (the Town) is now or will hereafter be directly or indirectly interested therein, or in any portion of the profits thereof in any manner which is unethical or contrary to law;

B. He has read the information contained herein relating to the work;

C. That in the event a Contract, as contemplated by this Proposal, is awarded to him, he will enter into a written Contract with the Town, and agrees that in case he fails to do so, the Town may determine that the bidder has abandoned the Contract, and thereupon the acceptance of this Proposal and the award shall be null and void, and that the proposal guarantee may be forfeited in whole or in part to the Town as the Town may determine, and he will, by such Contract, agree to furnish all materials herein required, within the time stipulated by the Town, will perform all services and will assume all liabilities and obligations connected therewith, all in accordance with the Contract, Specifications, and Instructions to Bidders, all of which are made a part hereof, and will accept in full payment therefore the following sums, to wit:

BID PROPOSAL

The undersigned representative of _____

hereby submits the following bid proposal on the equipment and/or work as specified:

1) Total cost to supply all labor, materials and equipment of same on Town of Vernon site.

_____DOLLARS

$_____

Name, address and insurance information of installer if subcontracted.

_____

2) WORK SHALL BE COMPLETED 90 CALENDAR DAYS FROM CONTRACT AWARD. EXTENSION SUBJECT TO WRITTEN APPROVAL BY DIRECTOR OF PUBLIC WORKS.

3) BID BOND ATTACHED: YES_____ NO_____

4) Bidder shall submit the name, address, responsible party and phone number of four or more municipalities and/or organizations where comparable work was completed. If none, state so.

1)_____

2)_____

3)_____

4)_____

5) Acknowledgement of Addenda. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1) Addendum No. 1, dated _____

2) Addendum No. 2, dated _____

3) Addendum No. 3, dated _____

4) Addendum No. 4, dated _____

6) The bidder shall submit unit prices for the following work:

(a) Repointing exterior brick $ _____ per square foot

(b) Rebuilding of exterior brick wall $ _____ per square foot

6) The following amounts shall be added to or deducted from the Bid Price. Refer to Section 01 23 00 – Alternates and 01 26 00 – Contract Modification Procedures Part 1.9 Alternates. This form requests a "difference" in bid price by adding to or deducting from the base bid price using the Alternates listed below.

1) Alternate No. 1 – Steel Stairs $ _____

2) Alternate No. 2 – Granite Sill/Header $ _____

3) Alternate No. 3 – Site Stair $ _____

4) Alternate No. 4 – Grading $ _____

7) Subcontractors and Supplies. The following companies shall execute subcontracts for the portions of the work indicated:

1) Site Work: _____

2) Concrete Work: _____

3) Masonry Work: _____

4) Carpentry Work: _____

5) Roofing Work: _____

8) The undersigned declares that the signer of this proposal is:
(a) INDIVIDUAL doing business as
(b) PARTNERSHIP doing business as
(c) CORPORATION entitled

organized under the laws of the State of _____ and having its principal offices at _____. The names of all partners of a partnership or the principal offices of a corporation will be submitted upon request.

_____
Signature of Authorized Representative

_____
Print Name and Title

_____
Print Firm Name

_____
Print Street Address

_____
Print City, State and Zip Code

_____
Contact Name

_____
Area Code and Telephone Number

I, _____, hereby certify that I do not hold any executive or appointive office in the government of the Town of Vernon; furthermore, I do not anticipate holding or seeking office in the Town of Vernon for the duration of this contract. I further certify that the firm, which I represent, as named above, is an Equal Opportunity Employer.

_____Date _____Signature

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AGREEMENT

Notice to Bidders: Town of Vernon Standard Form Agreement where the basis of payment is a Stipulated Sum, shall form the basis of Contract between the Owner and Contractor. The Agreement to be used for the Entrance Addition – Exterior Shell for the Citizens Block located at 28-34 Park Place in Vernon, CT is as follows;

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AGREEMENT

LEGAL NOTICE
TOWN OF VERNON
CONTRACT # 2076
CITIZENS BLOCK ENTRANCE ADDITION – EXTERIOR SHELL
28 – 34 PARK PLACE, VERNON, CT

This agreement, made and concluded by and between the Town of Vernon, a Municipal corporation organized and existing under the laws of the State of Connecticut, acting herein by its Town Administrator duly authorized, hereinafter designated the "Town" and _____ hereinafter designated the "Contractor".

A. WITNESSETH, That said Contractor has agreed, and by these presents does for his, their, or its heirs, executors, administrators, successors, and assigns covenant, promise and agree to and with the said Town, for the consideration hereinafter mentioned and contained, and under the penalty expressed in bonds hereunto annexed, that the said Contractor shall and will, at his, its, or their own proper charge, cost and expense furnish all materials in accordance with this contract and the specifications which are a part hereof, viz.;

CITIZENS BLOCK ENTRANCE ADDITION – EXTERIOR SHELL AT 28-34 PARK PLACE, VERNON, CT all to be in accordance with the terms of the proposal for said material submitted to the Town Administrator of the Town, and made part of this contract.

B. TOWN ADMINISTRATOR TO BE JUDGE. The Town Administrator of the Town and his duly authorized representatives, hereinafter referred to as the "Administrator" shall be judge of the character, nature and fitness of all the materials furnished under this contract.

C. CONTRACTOR RESPONSIBLE FOR WHOLE WORK. The Contractor shall be responsible for the entire work until its final acceptance, and any unfaithful or imperfect work or defective material that may be discovered at any time before said final acceptance shall be immediately corrected or removed by said Contractor on requirement of the Administrator.

D. INDEPENDENT CONTRACTOR The selected Contractor is an independent contractor and is not an employee, partner, or co-venturer of, or in any other service relationship with the Town of Vernon. The Contractor is not authorized to speak for, represent, or obligate the Town of Vernon in any manner without the prior expressed written authorization from the Town of Vernon.

E. DEFECTS IN MATERIAL. In the case the nature of the defect(s) is such that it is not expedient to have them corrected, the Administrator shall have the right to deduct from the amount due the Contractor on the final settlement of the accounts such sum of money as he considers a proper equivalent for the difference between the value of the materials specified and that furnished, or a proper equivalent for the damage.

F. PARTIAL PAYMENT NOT ACCEPTANCE. It is also agreed that this is an entire contract for one whole and complete work, and that no partial payments on account by the Town, nor the presence of the Administrator or inspectors, or their supervision or inspection of work or materials, shall constitute an acceptance of any part of the work before its entire completion and final acceptance.

G. COMMENCEMENT AND COMPLETION OF WORK. The Contractor shall furnish the material contracted for within the time stated therefore in the specifications for this work.

H. EXTENSION OF TIME. If the Contractor is delayed in the prosecution or completion of the work by or on account of any act or omission of the Town, or by strikes or causes beyond control of the Contractor, he shall be entitled to such reasonable extension of time for the completion of the work as may be decided upon by the Administrator, provided, however, that no claim for an extension of time for any reason shall be allowed, unless, within three days after such delay occurs, notice in writing of the fact of said delay, its causes, and the extension claimed, shall be given by the Contractor to the Administrator.

I. TIME LIMITS. All time limits stated in the Contract Documents are of the essence of the Contract.

J. CONTRACTOR'S DUTIES AND LIABILITIES. The Contractor shall comply with all local, state and national laws and regulations, and with all Town ordinances in the prosecution of the work, and shall secure all necessary permits and licenses.

K. INDEMNIFICATION/HOLD HARMLESS The selected Contractor agrees to defend, indemnify and hold harmless the Town of Vernon, its respective officers, employees, elected officials, agents, servants and volunteers from and against any and all claims, liabilities, obligations, causes of action of whatsoever kind and nature for damages, including but not limited to damage to the premises or other property, and costs of every kind and description arising from its entry upon the premises, or arising from work or other activities conducted thereon, alleging but not limited to bodily injury, personal injury, medical malpractice, property damage caused by the Contractor and its employees, contractor, sub-contractors and agents. This indemnification includes the Contractor's duty to defend the Town of Vernon from any such claims.

L. CONTRACTOR LIABLE FOR DAMAGES.

a. The Contractor shall indemnify and save harmless the Town, its officer, agents and servants against and from all damages, costs and expenses which they or any of them may suffer by, from or out of any and all claims for payment for materials or labor used or employed in the execution of this contract, and also for injuries or damages received or sustained to person or property, or both, in consequence of or resulting from any work performed by said Contractor, or of or from any negligence in guarding said work, or of or from any act or omission of said Contractor, and said Contractor shall also indemnify and save harmless said Town from all claims under the Workmen's Compensation Act arising under or out of this contract.
b. Employees' Compensation Insurance shall be as provided by Connecticut law and custom.
c. See specifications for required types of insurance.
d. Sub-contractors must be protected by insurance the same as the principal contractor.
e. It is agreed between the parties hereto that the amount of insurance set forth above does not in any way limit the liability of the Contractor to the Town by virtue of his promise to hold the Town harmless so that in the event that any claim results in a settlement or judgment in any amount above said limits, the Contractor shall be personally liable to the Town for the difference.
f. Certificates of the insurance company or companies, must be submitted to the

Administrator before the Contractor starts work. Should any insurance expire or be terminated during the period in which the same is required by this contract, the Administrator shall be notified thirty (30) days in advance and such expired or terminated insurance must be replaced with new insurance and a new certificate furnished to the Administrator.

g. Failure to provide the required insurance and certificates may, at the option of the Town, be held to be a willful violation of this Contract.

M. WAIVER OF SUBROGATION REQUIREMENT The selected Contractor will require all insurance policies in any way related to the work and secured and maintained by the Contractor to include clauses stating each carrier will waive all rights of recovery, under subrogation and otherwise, against the Town of Vernon, and its respective officers, employees, agents, servants, elected officials, and volunteers. The selected Contractor shall require of subcontractors, by appropriate written agreements, similar waivers each in favor of the Town of Vernon.

N. PATENTS. The Contractor shall defend any suits or proceedings brought against the Town for alleged infringements of patents by or by reason of any material furnished under this contract, and shall pay any damages or costs that may be awarded against the Town as a result of such suits, free of all expense to the Town.

O. AVOIDANCE OF CONTRACT. If this Contract shall be assigned without the written consent of the Administrator, or if at any time the Administrator shall be of the opinion that the work on said material is necessarily or unreasonably delayed, or that the Contractor is willfully violating any of the conditions or agreements of this contract, or that the progress of the work is, in his opinion, being so delayed that said material cannot be supplied within the required time, the Administrator may give written notice, postage prepaid, to the Contractor, at his business address, to that effect. If the Contractor shall not, within ten days after the mailing of such notice, take appropriate measures, in the judgment of the Administrator, to insure the satisfactory completion of the work, he may notify the Contractor in writing, to discontinue all work on said material under this contract; and it is hereby agreed that the Contractor shall thereupon at once stop work and cease to have the right or claim to possession of the material; and the Town may, by means of such other agents or contractors as shall to it seem advisable, complete the work herein described, or such part thereof as it may deem necessary, and may take possession of and use such materials, except as otherwise provided. The Contractor shall not remove any portion of the materials after receiving such notice as aforesaid. And said Town is hereby authorized and empowered to apply sums of money due or to become due to said Contractor under this Contract by way of reduction in damages, and as part payment of such additional expense incurred by the Town as aforesaid.

P. CONTINGENT UPON AVAILABILITY OF FUNDS The Town's obligation under this RFP is contingent upon the availability of appropriated funds from which payment for RFP purposes can be made. No legal liability on the part of the Town for any payment may arise until funds are made available and approved for this RFP and until a Purchase Order has been issued.

Q. PAYMENTS. In accordance with Connecticut General Statutes 31-53, Certified Payrolls with a statement of compliance shall be submitted monthly along with the Contractor's Application for Payment, to the Architect for review and certification. The Town will pay and the Contractor will receive, as full compensation for furnishing such materials, the amount stated in the proposal, or the sums of money computed at the several unit prices stated in the proposal submitted by the Contractor to the Administrator. A copy of the proposal is made a part of this Contract. The Town may make such deductions from these sums as are provided for in this Contract.

R. FINAL COMPLETION AND FINAL PAYMENT. Upon receipt of written notice that the work is ready for final inspection and acceptance and upon receipt of Final Application for Payment, the Administrator will promptly make such inspection and, when he finds the work acceptable under the Contract Documents and the contract fully performed, he will promptly issue a final Certificate of Payment stating that to the best of his knowledge, information and belief, and on the basis of his observations and inspections, the work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable. The Administrator's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth herein had been fulfilled.

The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.

S. NO INTEREST TO BE PAID. No interest is to be allowed or paid by the Town upon any monies retained under the provisions of this contract.

T. TERMINATION

Termination For Cause: If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner the obligations under this RFP, or if the Contractor shall violate any of the covenants, agreements, or stipulations of this RFP, the Municipality shall, thereupon, have the right to terminate this RFP by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In such event, all finished or unfinished documents, data, studies, and reports prepared by the Contractor under this RFP shall, at the option of the Municipality, become its property and the Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed prior to the effective date of termination.

Termination For Convenience: Either party to this RFP may terminate this RFP at any time by a notice in writing, effective not less than thirty (30) days prior to the termination date. If the RFP is terminated by the Municipality as provided herein, the Contractor will be paid for services performed up to the date of termination.

U. CONTENTS OF CONTRACT. The information for bidders, the proposal, the specifications, together with special provisions following herewith, and the bond and any and all additions which may be inserted or attached to any, or all of the sections as listed above, together with the drawings named in the information for bidders are made a part of this Contract.

V. AUTHORITY AND DUTIES OF INSPECTOR. An Inspector is a representative (but not a duly authorized representative as referred to in Article B of this Contract) of the Administrator assigned to make any and all necessary inspections of the work performed and materials furnished by the Contractor. Inspectors shall be authorized to inspect all work done on materials furnished. Such inspection may extend to all or any part of the work and to the preparation of the materials to be used. In case of dispute arising between the Contractor and the Inspector as to materials furnished or the manner of performing the work, the Inspector shall have the authority to reject material or suspend the work until the question at issue can be referred to and decided by the Administrator. The Inspector shall not be authorized to revoke, alter, enlarge, relax or release any requirements of the specifications nor to approve or accept any portion of the work, nor to issue instruction contrary to the plans and specifications. The Inspector shall

not act as foreman or perform other duties of the Contractor nor interfere with the management of the work by the Contractor. Any advice which the Inspector may give the Contractor shall in no way be construed as binding the Administrator of the Town in any way nor releasing the Contractor from the fulfillment of the terms of the Contract.

W. FAIR EMPLOYMENT PRACTICES. The Contractor hereby agrees that neither he nor his subcontractors will refuse to hire or employ or to bar or to discharge from employment an individual or to discriminate against him in compensation or in terms, condition or privilege of employment because of race, color, religious creed, age, sex, national origin or ancestry, except in the case of bona fide occupational qualification or need.

The Contractor further agrees that neither he nor his subcontractors will discharge, expel or otherwise discriminate against any person because he has opposed any unfair employment practice or because he has filed a complaint or testify or assisted in any proceeding under Section 31-127 of the Connecticut General Statutes. The advertisement of employment opportunities will be carried out in such manner as not to restrict such employment so as to discriminate against individuals because of their race, color, religious creed, age, sex, national origin or ancestry, except in the case of a bona fide occupational qualification or need.

The terms stated above are taken from Section 31-126 of the Connecticut General Statutes, "Unfair Employment Practices".

X. LAWS AND JURISDICTION. The parties hereto agree that this contract is subject to the laws and jurisdiction of the State of Connecticut.

Y. COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986. The Contractor hereby agrees that he is aware of and has complied with the hiring and documentation requirements of the Immigration Reform and Control Act of 1986.

The Contractor agrees that it has asked for and examined documentation in order to verify the legal employability of its employees and has executed the appropriate forms attesting thereto pursuant to the Act.

The Contractor further agrees to indemnify and hold the Town harmless from any costs and/or penalties incurred, including but not limited to fines, attorney's fees and costs arising from a claim of violation of said Act.

Z. DISPUTES. The parties agree that any dispute will be submitted to the Superior Court, Judicial District of Tolland, at Rockville, Connecticut.

AA. ANTI-TRUST PROVISIONS. The Contractor or Subcontractor offers and agrees to assign to the Town all right, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act, 15 U.S.C. Section 15, or under Chapter 624 of the General Statutes of Connecticut, arising out of the purchase of services, property or intangibles of any kind pursuant to a public purchase contract or subcontract. This assignment shall be made and become effective at the time the Town awards or accepts such contract, without further acknowledgement by the parties.

IN WITNESS WHEREOF, the parties hereto set their hands and seal this

_____ day of _____, 2021

Signed in the presence of:

_____

_____

THE TOWN OF VERNON:

By:_____
Michael J. Purcaro
Town Administrator

IN WITNESS WHEREOF, the parties hereto set their hands and seal this

_____ day of _____, 2021.

Signed in the presence of:

_____

_____

By:_____
Name:
Title:

END OF SECTION

PREVAILING WAGE RATES

Notice to Bidders: Each contractor that is awarded a contract after October 1, 2002 for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall utilize hourly wage rates as published by the Labor Commissioner, for the duration of such contract. The adjusted prevailing wage rate schedule to be used for this project are as follows;

Important Information:
For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.

**Note: Hazardous waste premium $3.00 per hour over classified rate.

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
3) Cranes (under 100 ton rated capacity)

Crane with boom including jib, 150 feet - $1.50 extra.

Crane with boom including jib, 200 feet - $2.50 extra.

Crane with boom including jib, 250 feet - $5.00 extra.

Crane with boom including jib, 300 feet - $7.00 extra.

Crane with boom including jib, 400 feet - $10.00 extra.

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

- Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of one apprentice in a specific trade.

Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work

- The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
- Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.
- The annual adjustments will be posted on the Department of Labor's Web page: www.ctdol.state.ct.us.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
- All subsequent annual adjustments will be posted on our Web Site for contractor access.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage.

- All Persons who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.
- All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)
- Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Tolland	Vernon	1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
Tolland	Vernon	1c) Asbestos Worker/Heat and Frost Insulator	$40.21	30.99
Tolland	Vernon	2) Boilermaker	$38.34	26.01
Tolland	Vernon	3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	$35.71	33.31 + a
Tolland	Vernon	3b) Tile Setter	$34.90	25.87
Tolland	Vernon	3c) Terrazzo Mechanics and Marble Setters	$31.69	22.35

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Tolland	Vernon	3d) Tile, Marble & Terrazzo Finishers	$26.70	21.75
Tolland	Vernon	3e) Plasterer	$33.48	32.06
Tolland	Vernon	------LABORERS------		
Tolland	Vernon	4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	$31.00	22.15
Tolland	Vernon	4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	$31.25	22.15
Tolland	Vernon	4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	$31.50	22.15
Tolland	Vernon	4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.	$32.00	22.15
Tolland	Vernon	4d) Group 5: Air track operator, sand blaster and hydraulic drills.	$31.75	22.15
Tolland	Vernon	4e) Group 6: Blasters, nuclear and toxic waste removal.	$34.00	22.15
Tolland	Vernon	4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	$32.00	22.15
Tolland	Vernon	4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	$29.28	22.15
Tolland	Vernon	4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	$28.74	22.15
Tolland	Vernon	4i) Group 10: Traffic Control Signalman	$18.00	22.15
Tolland	Vernon	5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	$34.53	25.64
Tolland	Vernon	5a) Millwrights	$34.94	26.19
Tolland	Vernon	6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	$40.25	29.17+3% of gross wage
Tolland	Vernon	7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	$55.12	34.765+a+b

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Tolland	Vernon	-----LINE CONSTRUCTION----		
Tolland	Vernon	Groundman	$26.50	6.5% + 9.00
Tolland	Vernon	Linemen/Cable Splicer	$48.19	6.5% + 22.00
Tolland	Vernon	8) Glazier (Trade License required: FG-1,2)	$39.18	22.55 + a
Tolland	Vernon	9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	$36.67	37.62 + a
Tolland	Vernon	----OPERATORS----		
Tolland	Vernon	Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	$42.45	25.30 + a
Tolland	Vernon	Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	$42.11	25.30 + a
Tolland	Vernon	Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	$41.32	25.30 + a
Tolland	Vernon	Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	$40.91	25.30 + a
Tolland	Vernon	Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	$40.28	25.30 + a
Tolland	Vernon	Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	$40.28	25.30 + a
Tolland	Vernon	Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	$39.95	25.30 + a
Tolland	Vernon	Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	$39.59	25.30 + a
Tolland	Vernon	Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.;	$39.17	25.30 + a

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
		transfer machine.		
Tolland	Vernon	Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	$38.71	25.30 + a
Tolland	Vernon	Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	$36.54	25.30 + a
Tolland	Vernon	Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	$36.54	25.30 + a
Tolland	Vernon	Group 12: Wellpoint operator.	$36.48	25.30 + a
Tolland	Vernon	Group 13: Compressor battery operator.	$35.86	25.30 + a
Tolland	Vernon	Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	$34.66	25.30 + a
Tolland	Vernon	Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	$34.23	25.30 + a
Tolland	Vernon	Group 16: Maintenance Engineer/Oiler.	$33.54	25.30 + a
Tolland	Vernon	Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	$38.11	25.30 + a
Tolland	Vernon	Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	$35.53	25.30 + a
Tolland	Vernon	------PAINTERS (Including Drywall Finishing)------		
Tolland	Vernon	10a) Brush and Roller	$35.62	22.55
Tolland	Vernon	10b) Taping Only/Drywall Finishing	$36.37	22.55
Tolland	Vernon	10c) Paperhanger and Red Label	$36.12	22.55
Tolland	Vernon	10e) Blast and Spray	$38.62	22.55
Tolland	Vernon	11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	$44.63	32.95
Tolland	Vernon	12) Well Digger, Pile Testing Machine	$37.26	24.05 + a
Tolland	Vernon	13) Roofer (composition)	$38.40	21.35
Tolland	Vernon	14) Roofer (slate & tile)	$38.90	21.35

As of: July 1, 2020

Building Rates

County	Town	Classification	Hourly Rate	Hourly Benefit
Tolland	Vernon	15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	$38.90	39.46
Tolland	Vernon	16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	$44.63	32.95
Tolland	Vernon	------TRUCK DRIVERS------		
Tolland	Vernon	17a) 2 Axle	$29.86	25.79 + a
Tolland	Vernon	17b) 3 Axle, 2 Axle Ready Mix	$29.97	25.79 + a
Tolland	Vernon	17c) 3 Axle Ready Mix	$30.03	25.79 + a
Tolland	Vernon	17d) 4 Axle, Heavy Duty Trailer up to 40 tons	$30.08	25.79 + a
Tolland	Vernon	17e) 4 Axle Ready Mix	$30.13	25.79 + a
Tolland	Vernon	17f) Heavy Duty Trailer (40 Tons and Over)	$30.35	25.79 + a
Tolland	Vernon	17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	$30.13	25.79 + a
Tolland	Vernon	18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	$45.92	26.08 + a
Tolland	Vernon	19) Theatrical Stage Journeyman	$25.76	7.34

As of: July 1, 2020

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

⇨ Please Note: If the "Benefits" listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the "Benefits" section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

End of Section

SUMMARY

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Work Covered by Contract Documents
B. Work Restrictions

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:
    1. Sitework is to be limited to the immediate area of the new addition and shall include build excavation and final grading, the elimination of a paved access drive between Elm Street and the parking area adjacent to the project area and the reinforcement of the grade/bank along Elm Street from the back of the existing building running north.
    2. Selective Demolition within the existing building at the basement, first and second floors to facilitate the installation of a new CMU stair shaft.
    3. Exterior wall stabilization, brick repointing & repair and window replacement on the north elevation of the existing building.
    4. Construction of a three-story masonry bearing wall addition on the north side of the existing building with a concrete sub-grade basement below. The addition will become the main entrance to the building. Work in this phase of the project is limited to the shell of the building and the construction of a new stair and elevator shaft. Site utilities, building systems, finishes and the elevator cab will be completed in a future phase.

B. Type of Contract: Stipulated Sum - Town of Vernon Agreement outlined in specification section 00 60 01.1 Agreement.

1.3 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
    1. Comply with limitations on the use of public streets and with other requirements of authorities having jurisdiction.

B. On-site Work Hours: Limit work in the existing building to normal business working hours of 8:00am to 5:00pm, Monday through Friday, unless otherwise indicated.
    1. Weekend Hours: 9:00am to 5:00pm
    2. Hours for noisy activities shall be limited to the hours of 10:00am to 4:00pm.

C. Noise Vibration and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

D. Non Smoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows or outdoor-air intakes.

E. Controlled Substances: Use of Tobacco Products and other controlled substances within the existing building is not permitted.

F. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor Personnel working on Project Site.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

ALTERNATES

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Fire Stair Construction. In lieu of wood structure stairs and landings, furnish and install concrete filled metal stair pans and landings. Stair stringers to be channel members. Guardrail and handrail design shall be similar as shown on the drawings but utilizing all metal components. Contractor to submit shop drawings of stairs, landings, guard/handrails and connections to structure for review by the structural engineer. All welds are to ground smooth. All metal stair components to be shop primed and finish painted in the field.

B. Alternate No. 2 – Window/Door Sills & Headers. In lieu of architectural cast stone furnish and install granite in the same size and configuration as shown on the drawings. Granite is to match sills & headers of the existing building and shall be approved by the architect.

C. Alternate No. 3 – Site Stairs. Furnish all labor and materials for a new concrete site stair as indicated on the civil engineering drawings. Work shall include associated grading, sidewalks and guard/stair rails.

D. Alternate No. 4 – Grading. The Town is contemplating eliminating the driveway off of Elm Street to the parking lot behind the building utilizing town forces and equipment. Provide the cost of all labor and materials associated with eliminating the driveway and associated grading from the total project cost. Contractor to coordinate schedule with the Town.

END OF SECTION

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit five copies, or via electronic format, of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use form that can be found after this section.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
      h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      i. Research reports evidencing compliance with building code in effect for Project.
      j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
n. Sample of Warranty (ies) with side-by-side comparison with that specified.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
   1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
      a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      b. Requested substitution will not adversely affect Contractor's construction schedule.
      c. Requested substitution has received necessary approvals of authorities having jurisdiction.
      d. Requested substitution is compatible with other portions of the Work.
      e. Requested substitution has been coordinated with other portions of the Work.
      f. Requested substitution provides specified warranty.
      g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 3 – EXECUTION

(Not Used)

END OF SECTION

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SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase)

Substitution Request Number: _____

From: _____

Project: _____

Date: _____

Contract For: _____

To: _____

Re: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached (Required for Review)

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Address: _____

Owner: _____

Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: ($).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐Drawings ☐Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase - continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: ☐

A/E's REVIEW AND RECOMMENDATION

☐ Approve Substitution - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
☐ Approve Substitution as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
☐ Reject Substitution - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

OWNER'S REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
☐ Substitution rejected - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐Contractor ☐Subcontractor ☐Supplier ☐Manufacturer ☐A/E

CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Schedule of Values.
B. Application for Payment.
C. Change procedures.
D. Defect Assessment.
E. Measurement and Payment - Unit Prices.
F. Requests for Information
G. Inspections for substantial completion and final completion

1.2 RELATED SECTIONS

A. Owner - Contractor Agreement:
B. Section 01 33 00 - Submittals: Schedule of Values.
C. Section 01 60 00 – Product Requirements: Product substitutions and alternates.

1.3 SCHEDULE OF VALUES

A. Submit typed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Split line items into subcategories for materials and labor. Identify bonds, insurance and site mobilization costs.

D. Include in each line item, the amount of each Allowance specified in this Section.

E. Revise schedule with each Application for Payment, to list approved change orders.

1.4 APPLICATIONS FOR PAYMENT

A. Submit one copy of each application on AIA Form G702 - Application and Certificate for Payment.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

1.5 CHANGE PROCEDURES

A. The Architect/Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized and will issue supplemental instructions.

B. The Architect/Engineer may issue a Proposal Request, which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change, the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within seven days.

C. The Contractor may propose a change by submitting request for change to the Architect/Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation in the form of unit costs and quantities for Material and Labor. Document any requested substitutions in accordance with Section 01 60 00.
    1. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation.
    2. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work, which are not pre-determined, execute Work under a Construction Change Authorization. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

D. Construction Change Authorization: Architect/Engineer may issue a directive, on AIA Form G713 Construction Change Authorization signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Contractor will promptly execute the change.

E. Change Order Forms: AIA G701 Change Order.

F. Execution of Change Orders: Architect will issue change orders for signature of parties as provided in the Conditions of the Contract.

G. **Contractor shall reimburse Owner for Architect's time spent reviewing proposed change orders more than twice (original and 1 revision) for the same item or scope of work.**

H. Contractor shall reimburse Owner for Architect's time spent evaluating an extensive number of claims submitted by the Contractor in connection with the Work.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect, it is not practical to remove and replace the Work, the Architect will direct an appropriate remedy or adjust payment.

1.7 MEASUREMENT AND PAYMENT - UNIT PRICES

A. Authority: Measurement methods are delineated in the individual specification sections.

B. Take measurements and compute quantities. The Architect will verify measurements and quantities.

C. Unit Quantities: Quantities and measurements indicated in the Bid Form are for contract purposes only. Actual quantities provided shall determine payment.

D. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application or installation of

an item of the Work; overhead and profit.

1.8 REQUESTS FOR INFORMATION

A. Contractor shall reimburse Owner for Architect's time spent responding to the Contractor's requests for information where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor prepared coordination drawings, or prior Project correspondence or documentation.

B. Refer to Section 01 31 00.

1.9 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates:
   1. Refer to Section 01 23 00 Alternates and Section 00 41 13.1Bid Form.

1.10 INSPECTIONS FOR SUBSTANTIAL COMPLETION AND FINAL COMPLETION

A. Contractor shall reimburse Owner for Architect's time spent inspecting any portion of the Work more than twice to determine final completion or to determine whether such portion of the Work is substantially complete in accordance with the requirements of the Contract Documents."

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

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PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Coordination.
B. Requests for Information
C. Pre-construction conference.
D. Site mobilization conference.
E. Progress meetings.
F. Pre-installation conferences.

1.2 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical and electrical work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 REQUESTS FOR INFORMATION (RFIs)

A. Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

B. RFI to include a detailed, legible description of item needing information or interpretation and the following:
    1. Project Date
    2. Date
    3. Name of Contractor
    4. Name of Architect
    5. RFI number, numbered sequentially
    6. RFI subject
    7. Specification Section number, title and related paragraphs as appropriate.

8. Drawing number and detail references, as appropriate.
9. Field dimensions and conditions, as appropriate.
10. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or Contract Sum, Contractor shall state impact in the RFI.
11. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. Architect will review each RFI, determine action required and respond. Allow ten working days for Architect's response for each RFI. RFIs received by Architect after 1:00pm EST will be considered as received the following day. If it is necessary for a Consultant to review an RFI allow for fifteen working days for both Architect and Consultant response for each RFI.

D. Architect's action may include a request for additional information, in which Architect's time for response will date from the time of receipt of additional information.

E. Architect's action that may result in a change to the Contract Time or Contract Sum may be eligible for Contractor to submit a Change Proposal in accordance with 01 26 00 Contract Modification Procedures.
   1. If Contractor believe the RFI response warrants change in Contract Time of Contract Sum, notify the Architect in writing within ten business days or receipt of the RFI response.

1.4 PRECONSTRUCTION CONFERENCE

A. Owner will schedule a conference after Notice of Award.

B. Attendance Required: Owner, Architect/Engineer & Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties in Contract, and the Architect/Engineer.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
   7. Scheduling.
   8. Use of premises by Owner and Contractor.
   9. Owner's requirements.
   10. Construction facilities and controls provided by Owner.
   11. Temporary utilities provided by Owner.
   12. Security and housekeeping procedures.
   13. Procedures for maintaining record documents.

1.5 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum weekly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Architect will record meetings and distribute copies within seven days to Contractor, Owner, participants, and those affected by decisions made.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect/Engineer as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems, which impede planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work.

1.6 PREINSTALLATION CONFERENCES

A. When required in individual specification Section, convene a pre-installation conference at work site prior to commencing work of the Section.

B. Require attendance of parties directly affecting, or affected by, work of the specific Section.

C. Notify Architect/Engineer four days in advance of meeting date.

D. Prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to participants, with two copies to Architect/Engineer.

E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

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SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including but not limited to the following:
   1. Submittal schedule.
   2. Shop Drawings.
   3. Product Data.
   4. Samples.
   5. Quality assurance submittals.
   6. Proposed "Substitutions/Equals".
   7. Warrantee samples.

B. Administrative Submittals: Refer to other Division 01 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
   1. Permits.
   2. Applications for Payment.
   3. Performance and payment bonds.
   4. Contractor’s construction schedule.
   5. Insurance certificates.
   6. List of subcontractors.

C. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Section 01 26 00 "Contract Modification Procedures" specifies requirements for submittal of requests for equals and substitutions.
   2. Section 01 26 00 "Contract Modification Procedures " specifies requirements for submittal of the Schedule of Values.
   3. Division 01 Section 01 31 00 " Project Management and Coordination " specifies requirements for submittal and distribution of meeting and conference minutes.
   4. Division 01 Section 01 77 00 "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 DEFINITIONS

A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended and as identified in the Specification Divisions 02 - 48.
   1. Preparation of Coordination Drawings is specified in Section 01 31 00 "Project Management and Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

C. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
      a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
      b. The Architect reserves the right to reject incomplete submitted packages.
   3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for re-submittals.
      a. Allow **fourteen (14) days** for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. Allow **fourteen (14) days** for reprocessing each submittal.
      d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label, title block or 8-1/2 inches x 11 inches cover page approved by the Architect, on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

   1. The minimum number of copies required for each submittal shall be determined at the pre-construction conference or by the Construction Administrator.
   2. Provide a space approximately 4 inches by 5 inches on the label, beside the title block or on the cover page on Shop Drawings to record the Contractor's review and approval markings and the action taken.
   3. Include the following information on the label for processing and recording action taken.

      a. Project Name.
      b. Date.
      c. Name and address of the Architect, Construction Administrator, and Owner Representative.
      d. Name and address of the Contractor.
      e. Name and address of the subcontractor.
      f. Name and address of the supplier.

g. Name of the manufacturer.
h. Number and title of appropriate Specification Section.
i. Drawing number and detail references, as appropriate.
j. Indicate either initial or resubmittal.
k. Indicate deviations from Contract Documents.
l. Indicate if "equal" or "substitution".

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. Copy the Construction Administrator on the transmittal. The Architect will return all submittals to the Contractor after action is taken with a complete copy of the submittal package and one complete copy of the submittal package. The Architect will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.5 SUBMITTAL SCHEDULE

A. After development and review by the Owner and Architect acceptance of the Contractor's Construction or CPM schedule prepare a complete schedule of submittals. Submit the schedule to the Construction Administrator within thirty (30) days of Contract Award.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor’s Construction or CPM Schedule.
2. Prepare the schedule in chronological order. Provide the following information:

a. Schedule date for the initial submittal.
b. Related section number.
c. Submittal category (Shop Drawings, Product Data, or Samples).
d. Name of Subcontractor.
e. Description of the part of Work covered.
f. Scheduled date for resubmittal.
g. Scheduled date for the Architect’s final release of approval.

B. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's Construction or CPM Schedule.
2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
    1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
    2. Submit all submittal items required for each specification section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
    3. Submit action submittals and informational submittals required by the same specification section as separate packages under separate transmittals.
    4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
        a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
    1. Initial Review: Allow fifteen 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination with related submittals not yet received. Additional time will be required if processing must be delayed to permit review of related subsequent submittals.
    2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
    3. Resubmittal Review: Allow fifteen (15) days for review of each resubmittal.
    4. Mass Submittals: Six (6) or more submittals in one (1) day or twenty (20) or more submittals in one (1) week. If “Mass Submittals” are received, Architect’s review time stated above may be extended as necessary to perform proper review. Architect will review “Mass Submittals based upon priority determined by Architect after consultation with Owner and Contractor.

E. Distribution: Following response to the initial submittal, print and distribute copies to the Construction Administrator, Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
    1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

F. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 SHOP DRAWINGS

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract

Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
   1. Dimensions.
   2. Identification of products and materials included by sheet and detail number.
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurement.
   6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches.
   7. Submit one (1) reproducible media and seven (7) prints as directed by the Construction Administrator. The Contractor's submittal shall identify the specification section and/or drawing number applicable to the submittal.
   8. Details shall be large scale and/or full size.

C. The Contractor shall review the Shop Drawings, stamp with this approval, and submit them with reasonable promptness and in orderly sequence so as to cause no delay in his Work or in the Work of any subcontractor. Shop Drawings shall be properly identified as specified for item, material, workmanship, and project number. At the submission, the Contractor shall inform the Architect, in writing of any deviation in the shop drawings from the requirements of the Contract Documents.

D. The Architect will review and comment on shop drawings with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. Refer to Article 5 of the General Conditions. Shop Drawings received by the Architect that indicate insufficient study of drawings and specifications, illegible portions or gross errors, will be rejected outright. Such rejections shall not constitute an acceptable reason for granting the Contractor additional time to perform the work.

E. The Contractor shall make any corrections required by the Architect and shall resubmit the required number of corrected copies of Shop Drawings until fully reviewed.

F. Upon final review submit four (4) additional prints, same as submitted, for use by the Construction Administrator.

G. The Architect's review and comments on Shop Drawings shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents.

H. Only final reviewed Shop Drawings are to be used on the Project site.

I. The Work installed shall be reviewed in accordance with the Shop Drawings and the drawings and specifications. Final Review of the Shop Drawings by the Architect shall constitute acceptance by the Owner and the Architect of a variation or departure that is clearly identified. If the contractor believes notations made by the A/E increases the value or scope of the CD’s, the contractor must provide written notice to the CA within seven (7) days of this issue. Final reviewed Shop Drawings shall not replace or be used as a vehicle

to issue or incorporate change orders or substitutions. Substitutions shall be submitted in accordance with Division 01 Section 01 25 00 "Substitution Procedures".

1.7 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, schedules, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
   1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
      a. Manufacturer's printed recommendations.
      b. Compliance with trade association standards.
      c. Compliance with recognized testing agency standards.
      d. Application of testing agency labels and seals.
      e. Notation of dimensions verified by field measurement.
      f. Notation of coordination requirements.
   2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
   3. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
   4. Submittals: Submit seven (7) copies of each required submittal; submit five (5) copies where required for maintenance manuals. The Architect will retain one (1) and will return the other marked with action taken and corrections or modifications required.
      a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
   5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
      a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
      b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.8 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
   1. Store, mount or display Samples on site in the manner to facilitate review of qualities indicated. Prepare Samples to match the Architect's sample. Include the following:
   a. Specification Section number and reference.
      b. Generic description of the Sample.
      c. Sample source.
      d. Product name or name of the manufacturer.
      e. Compliance with recognized standards.
      f. Availability and delivery time.

2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
    a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.
    b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
    c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
    d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.
3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices, unless otherwise noted in specification section.
    a. The Architect will review and return preliminary submittals with the Architects notation, indicating selection and other action.
4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit three (3) sets. The Architect will return one (1) set marked with the action taken.
5. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.
    a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
    b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
    1. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.
        a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.9 QUALITY ASSURANCE SUBMITTALS

A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
    1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 01 Section 01 40 00 "Quality Control."

1.10 ARCHITECT'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return promptly.
   1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:
   1. **Furnish as Corrected**: When the Architect marks a submittal "**Furnish as Corrected**," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Submit corrected copies for record. Final payment depends on that compliance.
   2. Returned for Resubmittal: When the Architect marks a submittal "Rejected, or Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
      a. Do not use, or allow others to use, submittals marked "**Rejected**, or **Revise and Resubmit**" at the Project Site or elsewhere where Work is in progress.
   3. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "**Reviewed**."

C. Unsolicited Submittals: The Architect will discard unsolicited submittals without action.

PART 2 – PRODUCTS

(Not Applicable)

PART 3 – EXECUTION

(Not Applicable)

END OF SECTION

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, telephone service, water, and sanitary facilities.

B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.

C. Construction Facilities: Access roads, truck access routes, parking, progress cleaning, and project signage.

1.2 TEMPORARY ELECTRICITY

A. Cost: By Contractor; Provide and pay for power service required from Utility source.

B. Provide temporary electric feeder from electrical service at location as directed.

C. Contractor will pay cost of energy used.

D. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.

E. Provide main service disconnect and overcurrent protection at convenient location, feeder switch at source distribution equipment.

F. Permanent convenience receptacles may be utilized during construction.

G. Provide adequate distribution equipment, wiring, and outlets to provide single-phase branch circuits for power and lighting.

1.3 TEMPORARY LIGHTING

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.

B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.

C. Provide and maintain 0.25 watt/sq ft H.I.D. lighting to interior work areas after dark for security purposes.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

E. Maintain lighting and provide routine repairs.

F. Permanent building lighting may be utilized during construction.

1.4 TEMPORARY VENTILATION

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.5 TEMPORARY WATER SERVICE

A. Provide, maintain and pay for suitable quality water service required.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.6 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

1.7 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide protection for plant life designated to remain. Replace damaged plant life.

C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

D. Provide temporary roofing as required.

1.8 TEMPORARY FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6-foot high fence around construction sites; equip with vehicular and pedestrian gates with locks.

1.9 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Provide temporary roofing as required.

1.10 SECURITY

A. Provide security and facilities to protect Work, and operations from unauthorized entry, vandalism, or theft.

1.11 ACCESS ROADS/TRUCK ACCESS ROUTES

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Existing on-site roads may be used for construction traffic.

1.12 PARKING

A. Arrange for temporary parking to accommodate construction personnel.

1.13 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Remove waste materials, debris, and rubbish from site periodically and dispose off-site.

1.14 PROJECT IDENTIFICATION

A. Temporary Signs - Provide two (2) project signs of exterior grade plywood and wood frame construction, painted, with die cut vinyl, self-adhesive letters and self-adhesive logo, to Owner's design and colors.

B. Erect on site at location established by Architect/Engineer.

C. No other signs are allowed without Owner permission except those required by law.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

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PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Products.
B. Transportation and handling.
C. Storage and protection.
D. Product options.
E. Substitutions.

1.2 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
B. Provide interchangeable components of the same manufacturer, for similar components.

1.3 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.
C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather-tight, climate-controlled enclosures.
B. For exterior storage of fabricated Products, place on sloped supports, above ground.
C. Provide off-site storage and protection when site does not permit on-site storage or protection.
D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
E. Store loose granular materials on solid flat surfaces in a well-drained area. Provide mixing with foreign matter.
F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

1.6 SUBSTITUTIONS

A. Architect/Engineer will consider requests for Substitutions only within 15 days after date of Owner-Contractor Agreement.
B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
D. A request constitutes a representation that the Contractor:
    1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
    2. Will provide the same warranty for the Substitution as for the specified Product.
    3. Will coordinate installation and make changes to other Work, which may be required for the Work to be complete with no additional cost to Owner.
    4. Waives claims for additional costs or time extension, which may subsequently become apparent.
    5. Will reimburse Owner for review and/or redesign services associated with approval by architect, engineer and other authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
F. Substitution Submittal Procedure:
    1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
    2. Submit shop drawings, Product data, and certified test results attesting to the proposed Product equivalence.
    3. The Architect will notify Contractor, in writing, of decision to accept or reject request.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not used)

END OF SECTION

CONTRACT CLOSEOUT

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Closeout Procedures.
B. Final Cleaning.
C. Project Record Documents.
D. Warranties.

1.2 RELATED SECTIONS
A. Section 01 50 00 - Construction Facilities and Temporary Controls: Progress cleaning.

1.3 CLOSEOUT PROCEDURES
A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's inspection.

B. Provide submittals to Architect/Engineer and Owner that are required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING
A. Execute final cleaning prior to final inspection.

B. Clean debris from roofs, gutters, downspouts, and drainage systems.

C. Clean site; sweep paved areas, rake clean landscaped surfaces.

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

1.5 PROJECT RECORD DOCUMENTS
A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
   1. Contract Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Store Record Documents separate from documents used for construction.
   7. Record information concurrent with construction progress.

B. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.

3. Changes made by Addenda and Modifications.

C. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first 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.

D. Delete Architect/Engineer title block and seal from all documents.

E. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.6 WARRANTIES

A. Provide notarized copies.

B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.

C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.

D. Submit prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

PART 2 – PRODUCTS

(Not used)

PART 3 – EXECUTION

(Not used)

END OF SECTION

SELECTIVE INTERIOR DEMOLITION

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Remove designated partitions and components.
B. Cap and identify utilities.
C. Remove all materials necessary to complete the scope of work as shown in the contract documents.

1.2 RELATED WORK

A. Section 01 50 00 - Construction Facilities and Temporary Controls: Temporary barriers and enclosures.
B. Section 01 50 00 - Construction Facilities and Temporary Controls: Security.
C. Section 01 50 00 - Construction Facilities and Temporary Controls: Cleaning during construction.
D. Section 01 77 00 - Contract Closeout: Project record documents.

1.3 SUBMITTALS

A. Submit demolition and removal procedures and schedule under provisions of Section 01 33 00.

1.4 EXISTING CONDITIONS

A. Conduct demolition to minimize interference with adjacent building areas. Maintain protected egress and access at all times.

B. Provide, erect, and maintain temporary barriers and security devices.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Erect and maintain weatherproof closures for exterior openings as specified in Section 01 50 00.

B. Protect existing items, which are not indicated to be altered.

C. Disconnect, remove, and cap designated utility services within demolition areas.

D. Mark location of disconnected utilities. Identify and indicate capping locations on Project Record Documents.

3.2 EXECUTION

A. Demolish in an orderly and careful manner. Protect existing construction to remain.

B. Except where noted otherwise, immediately remove demolished materials from site.

C. Relics, antiques, and similar objects remain the property of the Owner. Notify Architect prior to removal and obtain acceptance regarding method of removal.

D. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.

E. Do not burn or bury materials on site.

F. Remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.

END OF SECTION

SECTION 02 44 00

TEMPORARY SHORING AND PROTECTION

PART 1 - GENERAL

1.1 INCLUDED IN THIS SECTION

A. Design and installation of all required temporary shoring, bracing and support to enable all necessary reconstruction and repair to be completed in a safe and expedient manner.

1.2 REFERENCES

A. Comply with the following standard material specifications that apply to the materials used.

1.3 SUBMITTALS

A. Submit the following items to the Architect for review:

1. Drawings showing shoring, bracing, and temporary supports for the existing and re-installed structure as appropriate.

1.4 QUALITY ASSURANCE

A. Comply with all referenced standards for the products employed.

B. Schedule all appropriate site visits and inspections with the design Engineer for the shoring system.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

A. Provide products and materials that are appropriate to the application and permitted by the Connecticut State Building Code.

PART 3 - EXECUTION

3.1 TEMPORARY SHORING, BRACING AND SUPPORT

A. The contractor shall be solely responsible for all means and methods of construction employed on this project including all temporary bracing, support and protection of the existing Structure. Contractor shall retain the services of a Connecticut registered professional structural engineer at his own expense if and as may be needed to maintain safe and stable conditions on the project. Any sequences of work or methods indicated or implied in the contract documents are present only as assumptions on which the design of the permanent installations are based and are to be considered as a suggested option for review by the contractor.

B. Field Survey and Analysis:

1. Select shoring, bracing and support locations and measure all existing geometry and note existing conditions. Locate points of attachment and support that will best suit progress of work.

2. Perform a structural analysis of the areas to be affected by the work and determine loads on temporary shoring, bracing and support system.

C. Design Shoring, Bracing and Support:

1. Shoring, bracing and support shall be designed to maintain existing lines and surfaces without deflection during work. Design shall be in accordance with gravity dead, live and wind load resistance requirements of the Connecticut State Building Code.

2. Design shall be sufficient for existing and new material loads and anticipated construction loads.

3. Design shall allow for distribution of loads to supporting structure and shall limit all movement to less than 1/4" at full loading and a given span length divided by 360 and within appropriate limits to prevent damage to the supported elements or materials. Stresses on supporting structure shall not exceed safe, commonly allowable stresses for the materials in consideration of their age and conditions.

4. Minimize use of side grain bearing timbers that may be susceptible to dimensional variations with changes in moisture and temperature.

D. Construct shoring, bracing and support in accordance with approved design submittal and proper and standard construction practice. Work shall be installed so as not to permanently mar or stain the exposed.

E. Maintenance: Maintain shoring, bracing and support in a safe condition during all phases of work. Keep wood generally dry and of constant moisture content. Protect wood from swelling or shrinking with weather and humidity fluctuations..

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Sections:

1. Section 310000 Earthwork

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Action Submittal:

1. Design Mixtures: For each concrete mixture.

1.4 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Comply with the following sections of ACI 301, unless modified by requirements in the Contract Documents:

1. "General Requirements."
2. "Formwork and Formwork Accessories."
3. "Reinforcement and Reinforcement Supports."
4. "Concrete Mixtures."
5. "Handling, Placing, and Constructing."
    a. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and formwork accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:

B. Portland Cement: ASTM C 150.

C. Normal-Weight Aggregate: ASTM C 33, graded.

D. Water: ASTM C 94/C 94M.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2.5 RELATED MATERIALS

A. Vapor Retarder: Plastic sheet, ASTM E 1745, Class A or B.

B. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.7 CONCRETE MIXTURES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45.

3. Slump Limit: to suit placement.

4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR RETARDERS

A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended adhesive or joint tape.

3.4 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

3.6 CONCRETE PLACEMENT

A. Comply with ACI 301for placing concrete.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Consolidate concrete with mechanical vibrating equipment.

3.7 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.

C. Do not further disturb surfaces before starting finishing operations.

D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, fluid-applied or direct-to-deck-applied membrane roofing, or sand-bed terrazzo.

3.8 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive

covers.

d. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests: Perform according to ACI 301.

1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.

3.10 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section

END OF SECTION

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UNIT MASONRY RESTORATION

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.

1.2 SUMMARY

A. Section includes maintenance of unit masonry consisting of brick masonry restoration and cleaning as follows:
   1. Repairing unit masonry, including replacing units.
   2. Repointing joints.
   3. Cleaning exposed unit masonry surfaces.

1.3 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Division 1 Section "Unit Prices."
   1. Unit prices apply to authorized work covered by quantity allowances for areas that exceed the base bid. Refer to drawings for more info.
   2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Samples for Initial Selection: For the following:
   1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches long by 1/4 inch wide, set in aluminum or plastic channels.
      a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching the cleaned masonry when cured and dry.
      b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.
   2. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.
      a. Have each set contain a close color range of at least three Samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.
   3. Include similar Samples of accessories involving color selection.

C. Samples for Verification: For the following:
   1. Each type of masonry unit to be used for replacing existing units. Include sets of Samples as necessary to show the full range of shape, color, and texture to be expected.
      a. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.

2. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches long by 1/4 inch wide, set in aluminum or plastic channels.
    a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of material for masonry restoration (face brick, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.

B. Mockups: Prepare mockups of restoration to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.
    1. Masonry Repair: Prepare sample areas for each type of masonry material indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than 2 adjacent whole units or approximately 48 inches in least dimension. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
        a. Patching: Three small holes at least 1 inch in diameter for each type of masonry material indicated to be patched, so as to leave no evidence of repair.
    2. Repointing: Rake out joints in 2 separate areas, each approximately 36 inches high by 48 inches wide for each type of repointing required and repoint one of the areas.

    3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.

B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store lime putty covered with water in sealed containers.

F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.

B. Repair masonry units and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing unless otherwise indicated:
   1. When air temperature is below 40 deg F , heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F
   2. When mean daily air temperature is below 40 deg F , provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.

D. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and windbreaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

F. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

1.8 COORDINATION

A. Coordinate masonry restoration with public circulation patterns at Project site. Some work is near public circulation patterns. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

1.9 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.

B. Order sand and gray Portland cement for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.

C. Perform masonry restoration work in the following sequence:
   1. Remove plant growth below only if cleaning precedes repairs and repointing. For this, masonry and joints must be sufficiently sound to prevent water and chemicals from penetrating into building.
   2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of
   3. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.

4. Repair masonry, including replacing existing masonry with new masonry materials.
5. Rake out mortar from joints to be repointed.
6. Point mortar and sealant joints.
7. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
8. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
9. Clean masonry surfaces.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

A. Face Brick: Provide face brick, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.
   1. Provide units with colors, color variation within units, surface texture, size, and shape to match existing brickwork and with physical properties within 10 percent of those determined from preconstruction testing of selected existing units.
      a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.
   2. Tolerances as Fabricated: Comply with tolerance requirements in ASTM C 216, Type FBX.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.
   1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Factory-Prepared Lime Putty: ASTM C 1489.

D. Quicklime: ASTM C 5, pulverized lime.

E. Mortar Sand: ASTM C 144 unless otherwise indicated.
   1. For pointing mortar, provide sand with rounded edges.
   2. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary, to achieve suitable match.

F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

G. Water: Potable.

2.3 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
    1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
    1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures in mortar unless otherwise indicated.

E. Mortar Proportions: Mix mortar materials in the following proportions:
    1. Pointing Mortar for Brick: 1 part Portland cement, 2 parts lime, and 6 parts sand.
        a. Add mortar pigments to produce mortar colors required.
    2. Pointing Mortar for Terra Cotta: 1 part white Portland cement, 1 part lime, and 6 parts sand.
        a. Add mortar pigments to produce mortar colors required.
    3. Rebuilding (Setting) Mortar: Same as pointing mortar.
    4. Rebuilding (Setting) Mortar: Comply with ASTM C 270, Proportion Specification, Type N unless otherwise indicated; with cementitious material limited to Portland cement and lime.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.
    1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Prevent mortar from staining face of surrounding masonry and other surfaces.
    1. Cover sills, ledges, and projections to protect from mortar droppings.
    2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
    3. Immediately remove mortar in contact with exposed masonry and other surfaces.
    4. Clean mortar splatters from scaffolding at end of each day.

3.2 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
    1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole bricks as possible.
   1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
   2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
   3. Store brick for reuse. Store off ground, on skids, and protected from weather.
   4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged brick with other removed brick in good quality, where possible, or with new brick matching existing brick, including size. Do not use broken units unless they can be cut to usable size.

G. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
   1. Maintain joint width for replacement units to match existing joints.
   2. Use setting buttons or shims to set units accurately spaced with uniform joints.

H. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min.. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
   1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
   2. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.3 MASONRY UNIT PATCHING

A. Repointing shall match the color, texture, joint width and joint profile of the existing historic masonry. Specifications and repointing samples shall be reviewed and approved by the Connecticut Commission on Culture & Tourism before proceeding with this work.

B. Patch the following masonry units unless another type of replacement or repair is indicated:
   1. Units with holes.
   2. Units with chipped edges or corners.
   3. Units with small areas of deep deterioration.

C. Remove and replace existing patches unless otherwise indicated or approved by Architect.

D. Patching Bricks:
   1. Remove loose material from masonry surface. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
   2. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of masonry unit.
   3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
   4. Rinse surface to be patched and leave damp, but without standing water.
   5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
   6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
   7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
   8. Keep each layer damp for 72 hours or until patching compound has set.

3.4 REPOINTING MASONRY

A. Repointing shall match the color, texture, joint width and joint profile of the existing historic masonry. Specifications and repointing samples shall be reviewed and approved by the Connecticut Commission on Culture & Tourism before proceeding with this work.

B. Rake out and repoint joints to the following extent:
   1. All joints in areas indicated.
   2. Joints where mortar is missing or where they contain holes.
   3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
   4. Cracked joints where cracks are 1/8 inch or more in width and of any depth.
   5. Joints where they sound hollow when tapped by metal object.
   6. Joints where they are worn back 1/4 inch or more from surface.
   7. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
   8. Joints where they have been filled with substances other than mortar.
   9. Joints indicated as sealant-filled joints.

C. Do not rake out and repoint joints where not required.

D. Rake out joints as follows, according to procedures demonstrated in approved mockup:
   1. Remove mortar from joints to depth of joint width plus 1/8 inch, but not less than 1/2 inch or not less than that required to expose sound, unweathered mortar.
   2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
   3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.

a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Architect's written approval based on approved quality-control program.

E. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

F. Pointing with Mortar:

1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch . Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.
    a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
    b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.5 FINAL CLEANING

A. Cleaning of exterior masonry shall be accomplished using the gentlest means possible without damaging the surface of the masonry. Specifications and test cleaning samples shall be reviewed and approved by the Connecticut Commission on Culture & Tourism before proceeding with this work.

B. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

C. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.

D. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

E. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

3.6 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Notify inspectors in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors have had reasonable opportunity to make inspections of work areas at lift device or scaffold location.

END OF SECTION

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UNIT MASONRY

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Concrete Masonry Units.

B. Clay Face Brick.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

C. Samples for Verification: For each type and color of exposed masonry unit and colored mortar.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product. For masonry units, include data on material properties.

B. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
   2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.5 QUAILITY ASSURANCE

A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
   1. Build sample panels for typical exterior wall approximately 48 inches long by 36 inches high by full thickness.

1.6 FIELD CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

B. Integral Water Repellent: Provide units made with integral water repellent for all units.

C. CMUs: ASTM C 90.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
   2. Density Classification: Normal weight unless otherwise indicated.

2.3 CONCRETE LINTELS

A. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs**.**

2.4 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
   1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
   2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Clay Face Brick
   1. Manufacturer
      a. Watsontown Brick Company, 86 Portmay Road; Watsontown, PA 17777; Tel: (800) 538-2040; Fax (570) 538-5903; Web: www.watsontownbrick.com
      b. Substitutions: Not permitted.
      c. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.
   2. Face Brick shall be Type FBS as follows:
      a. Pennsylvania Molded, Alverton – Type 1, modular in size 2-1/4 by 3-5/8 by 7-5/8 inches and conform to the requirements of ASTM C 216, Grade SW, or
      b. Pennsylvania Molded, Alverton – Type 2, modular in size 2-1/4 by 3-5/8 by 7-5/8 inches and conform to the requirements of ASTM C 216, Grade SW, or
      c. Pennsylvania Molded, Philadelphia – Type 1, modular in size 2-1/4 by 3-5/8 by 7-5/8 inches and conform to the requirements of ASTM C 216, Grade SW.
   3. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.
   4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.

E. Aggregate for Mortar: ASTM C 144.
   1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
   2. White-Mortar Aggregates: Natural white sand or crushed white stone.
   3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Aggregate for Grout: ASTM C 144.

G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

I. Water: Potable.

2.6 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.
   1. Interior Walls: Hot-dip galvanized carbon steel.
   2. Exterior Walls: Hot-dip galvanized carbon steel.
   3. Wire Size for Side Rods: 0.148-inch diameter.
   4. Wire Size for Cross Rods: 0.148-inch diameter.
   5. Wire Size for Veneer Ties: 0.148-inch diameter.
   6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
   7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.

D. Masonry-Joint Reinforcement for Multiwythe Masonry:
   1. Ladder type with one side rod at each face shell of hollow masonry units more than 4 inches wide, plus one side rod at each wythe of masonry 4 inches wide or less.
   2. Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch cover on outside face.
   3. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

E. Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- diameter, hot-dip galvanized carbon-steel continuous wire.

2.7 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

   1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
   2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
   3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
   1. Wire: Fabricate from 3/16-inch- diameter, hot-dip galvanized-steel wire.

D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, hot-dip galvanized-steel wire.
   2. Tie Section: Triangular-shaped wire tie made from 0.187-inch-diameter, hot-dip galvanized-steel wire.

E. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.060-inch-thick steel sheet, galvanized after fabrication.
   2. Tie Section: Triangular-shaped wire tie made from 0.187-inch-diameter, hot-dip galvanized-steel wire.
   3. Corrugated-Metal Ties: Metal strips not less than 7/8 inch wide with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch made from 0.060-inch-thick steel sheet, galvanized after fabrication with dovetail tabs for inserting into dovetail slots in concrete.

F. Partition Top Anchors: 0.105-inch-thick metal plate with a 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

G. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
   1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

H. Adjustable Masonry-Veneer Anchors:
   1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
   2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.075-inch-thick steel sheet, galvanized after fabrication.
   3. Fabricate wire ties from 0.187-inch-diameter, hot-dip galvanized-steel wire unless otherwise indicated.
   4. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section.
   5. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a gasketed sheet metal anchor section, with pronged legs of length to match thickness of insulation or sheathing and raised rib-stiffened strap to provide a slot for inserting wire tie.
   6. Seismic Masonry-Veneer Anchors: Connector section and rib-stiffened, sheet metal anchor section with screw holes top and bottom, and having slotted holes for inserting connector section. Connector section consists of a rib-stiffened, sheet metal bent plate, sheet metal clip, or wire tie with rigid PVC extrusion designed to engage continuous wire.
   7. Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except with hex washer head and neoprene or EPDM washer, No. 10 diameter, and with coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B 117.

2.8 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:

1. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
2. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
3. Fabricate metal expansion-joint strips from copper to shapes indicated.

B. Flexible Flashing: Use one of the following unless otherwise indicated:
1. Copper-Laminated Flashing: 5-oz./sq. ft. copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
2. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch.
3. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than.
4. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
5. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D 4637/D 4637M, 0.040 inch thick.

C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

2. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.
3. Vinyl Weep Hole/Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Configuration: Provide one of the following:
a. Strips, full depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.
b. Strips, not less than 3/4 inch high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
c. Sheets or strips full depth of cavity and installed to full height of cavity.
d. Sheets or strips not less than 3/4 inch thick and installed to full height of cavity, with additional strips 4 inches high at weep holes and thick enough to fill entire depth of cavity and prevent weep holes from clogging with mortar.

2.10 MASONRY-CELL FILL

A. Loose-Fill Insulation: Perlite complying with ASTM C 549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).

B. Lightweight-Aggregate Fill: ASTM C 331/C 331M.

2.11 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.12 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime mortar.
4. For reinforced masonry, use portland cement-lime mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
1. For masonry below grade or in contact with earth, use Type M.

2. For reinforced masonry, use Type M or Type N depending on location above or below grade.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
5. For interior nonload-bearing partitions, Type O may be used instead of Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

3.1 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

C. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.2 TOLERANCES

A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2-inch total.

B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.3 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

E. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

A. Lay CMU's as follows:
1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Lay structural clay tile as follows:
1. Lay vertical-cell units with full head joints unless otherwise indicated. Provide bed joints with full mortar coverage on face shells and webs.
2. Lay horizontal-cell units with full bed joints unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be

squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.

3. Maintain joint thicknesses indicated except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch- thick joints.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 COMPOSITE MASONRY

A. Bond wythes of composite masonry together using one of the following methods:
   1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 4.5 sq. ft. of wall area spaced not to exceed 36 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
   2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
      a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
      b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.

B. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide individual metal ties not more than 16 inches o.c.
   2. Provide continuity with masonry-joint reinforcement by using prefabricated T-shaped units.
   3. Provide rigid metal anchors not more than 48 inches o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together using one of the following methods:
   1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 4.5 sq. ft of wall area spaced not to exceed 36 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches (915 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
   2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
      a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
      b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.

c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Parge cavity face of backup wythe in a single coat approximately 3/8 inch thick. Trowel face of parge coat smooth.

D. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

3.7 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:
   1. Fasten screw-attached and seismic anchors to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
   2. Embed connector sections and continuous wire in masonry joints.
   3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
   4. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.

3.8 MASONRY-CELL FILL

A. Pour loose-fill insulation into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet.

3.9 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
   3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

3.10 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. Install flashing as follows unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
   2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within 1/2 inch of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches on interior face.
   3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
   4. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
   5. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.

B. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
   1. Use specified weep/cavity vent products to form weep holes.
   2. Space weep holes 24 inches o.c. unless otherwise indicated.
   3. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.

C. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.11 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.12 FIELD QUALITY CONTROL

A. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

B. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

D. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

E. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.13 PARGING

A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.14 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
   3. Protect adjacent surfaces from contact with cleaner.
   4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
   6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.15 MASONRY WASTE DISPOSAL

A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
   1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

ARCHITECTURAL CAST STONE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Architectural Cast Stone
   1. Cast-stone lintel.
   2. Cast-stone header.

1.2 RELATED SECTIONS

A. Section 04 20 00 - Unit Masonry

B. Section 07 92 00 – Joint Sealers

1.3 REFERENCES

A. ACI 318 – Building Code Requirements for Reinforced Concrete

B. ASTM A 615/A 615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. ASTM C 33 – Standard Specification for Concrete Aggregates.

D. ASTM C 150 – Standard Specification for Portland Cement.

E. ASTM C 270 – Standard Specification for Mortar for Unit Masonry.

F. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete.

G. ASTM C 642 – Standard Test Method for Specific Gravity, Absorption and Voids in Hardened Concrete.

H. ASTM C 979 – Standard Specification for Pigments for Integrally Colored Concrete.

I. ASTM C 1194 – Standard Test Method for Compressive Strength of Architecture Cast Stone.

J. ASTM C 1194 – Standard Test Method for Absorption of Architecture Cast Stone.

K. ASDTM C 1364 – Standard Specification for Architectural Cast Stone.

L. ASTM C 2244 – Standard Test Method for Calculation of Color Differences from Instrumentally Measures Color Coordinates.

M. Cast Stone Institute Technical Manual.

1.4 DEFINITIONS

A. Cast Stone: Highly refined architectural concrete stone product manufactures to simulate fine grain texture of natural stone.

B. Vibrant Dry Tamp (VDT) Casting Method: Vibratory ramming of damp, zero-slump concrete against rigid framework until it is densely compacted and ready for immediate removal from form.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. For cast-stone units, include dimensions and finishes.

B. Shop Drawings: Show fabrication and installation details for cast-stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

C. Samples:
   1. For each color and texture of cast stone required.
   2. For colored mortar.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units with a minimum of 10 years of experience producing cast stone similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute.

B. Standards: Comply with requirements of the Cast Stone Institute Technical Manual.

C. Mock-up: Provide full size cast stone components for installation in mock-up of exterior wall. Approved mock-up will become standard for appearance and workmanship.
   1. Mock-up shall not remain as part of the completed work. At Architect's direction, demolish the mock-up and remove debris.

1.8 DELIVERY, STORAGE AND HANDLING

A. Delivery:
   1. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration.
   2. Protect corners from damage.

3. Number each piece individually to match shop drawings and schedules.

B. Storage:
1. Store cast stone components and installation materials in accordance with manufacturer's instruction.
2. Store cast stone components on pallets with non-staining, waterproof covers.
3. Ventilate under covers to prevent condensation.
4. Prevent contact with dirt and/or organic materials

1.9 SCHEDULING

A. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Custom Cast Stone Inc.: 734 East 169th Street, Westfield, IN 46074; Tel: (888) 776-9960; Fax: (317) 896-1701; Web: www.customcaststone.com

2.2 ARCHITECTURAL CAST STONE

A. Cast-Stone Units: Comply with ASTM C 1364.
1. Units shall be manufactured using the vibrant dry tamp method.
2. Compressive Strength, ASTM C 1194: 6,500 psi (44.8 MPa) minimum at 28 days.
3. Absorption, ASTM C 642 or C 1195: 6% maximum at 28 days.
4. Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.

B. Surface Texture:
1. Fine grained texture, similar to natural stone.
2. No bug holes, air voids or other surface blemishes.

C. Color and Finish:
1. Match color and finish of lintels and headers on existing building. Provide samples for selection by the architect.

2.3 CAST STONE MATERIALS

A. Portland Cement: ASTM C 150, Type 1, white or gray as required to match specified color.

B. Coarse Aggregate: ASTM C 33, except for gradation; quartz or limestone.

C. Fine Aggregates: ASTM C 33, except for gradation, natural or manufactured sands.

D. Pigments: ASTM C 979, inorganic iron oxides.

E. Admixtures:

1. ASTM C 494.
2. Integral water repellants and other chemicals for which no ASTM standards exists. Previously established as suitable for use in concrete by proven field performance or through laboratory testing.

F. Water: Potable.

G. Reinforcing Bars: ASTM A 615/A 615M, galvanized or epoxy coated.

2.4 MOTAR MATERIALS

A. Mortar: ASTM C 270, Type N.

2.5 ACCESSORIES

A. Anchors: Non-corrosive type, sized for conditions, fabricated from hot-dip galvanized steel to comply with ASTM A 123/A 123M.

B. Sealant: As specified in Section 07 92 00 – Joint Sealers

C. Cleaner:
1. Manufacturer's standard-strength, general purpose cleaner designed for removing mortar and grout stains, efflorescence and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces.
2. Expressly approved for intended use by cast stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.6 FABRICATION

A. Shapes: Unless otherwise indicated on drawings, provide:
1. Suitable wash on exterior sills, copings, projecting courses and components with exposed top surfaces.
2. Provide drips on projecting components, wherever possible.

B. Reinforcement:
1. As required to withstand handling and structural stresses.
2. Comply with ACI 318.
3. Minimum of 0.25 % of cross-sectional area of panels which exceed 12 inches in width.
4. Minimum reinforcing coverage shall be twice the diameter of reinforcing bars.

C. Curing:
1. Cure cast stone components with a direct field steam generator at a minimum temperature of 105 degrees F for a minimum of 6 hours within 12 hours of fabrication.
2. Cure cast stone components in presence of carbon monoxide and carbon dioxide to promote carbonation at surface to minimize efflorescence.

D. Finishing: Remove cement film from exposed surfaces before packaging for shipment.

E. Tolerances: Fabricate cast stone components with tolerances in accordance with Cast Stone Institute Technical Manual, unless otherwise specified.
   1. Dimensions: Plus or minus 1/8 inch.
   2. Maximum Bow, Camber or Twist: Length/360.

2.7 SOURCE QUAILTY CONTROL

A. Testing: Test compressive strength and absorption of specimens selected at random from plant production.
   1. Test in accordance with referenced testing standards.
   2. Select samples at a rate of 3 per 500 cubic feet with a minimum of 3 per production week.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine construction to receive cast stone components. Notify Architect id construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

B. Examine cast stone components for fit and finish before installation. Do not install unacceptable components.

3.2 INSTALLATION

A. General: Install cast-stone units to comply with requirements in Section 042000 "Unit Masonry."

B. Setting:
   1. Drench cast stone components with clear running water immediately before installation.
   2. Do not use pry bars or other equipment in a manner that could damage cast stone components.
   3. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
   4. Set cast stone components in a full bed of mortar unless otherwise indicated on the drawings.
   5. Fill vertical joints will mortar.
   6. Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.

C. Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

D. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

E. Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.

F. Sealant Joints:
   1. Comply with requirements of Section 07 92 00 – Joint Sealers
   2. Prime ends of cast stone components, insert properly sized foam backing rod and install sealant using sealant gun.
   3. Provide sealant joints at following locations and as indicated on the drawings.
      a. Cast stone components with exposed tops.
      b. Joints at relieving angles.
      c. Control and expansion joints.

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/8 inch in 5 feet.

B. Variation from Level: Do not exceed 1/8 inch in 5 feet.

C. Variation in joint width: Do not vary joint thickness more than 1/8 inch of nominal joint width, whichever is less.

D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.

3.4 REPAIR

A. Surface Repair:
   1. Repair chipping and other surface damage noticeable when viewed in direct daylight at 20 feet.
   2. Repair with matching touch-up material provided by the manufacturer and in accordance with manufacturer's instructions.
   3. Repair methods and results shall be approved by the Architect.

3.5 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean cast stone as work progresses.
   1. Clean cast stone components as work progresses.
   2. Remove mortar fins and smears before tooling joints.
   3. Remove excess sealant immediately, including spills, smears, and spatter.

D. Final Cleaning: Clean exposed cast stone as follows:

1. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
2. Wet surfaces with water before applying cleaner.
3. Apply cleaner to cast stone components in accordance with manufacturer's instructions.
4. Remove cleaner promptly by rinsing thoroughly with clear water.

3.6 INSPECTION AND ACCEPTANCE

A. Inspect in accordance with Cast Stone Institute Technical Manual.

3.7 WATER REPELLANT

A. Apply silane or siloxane water repellant for weather-proofing cast stone components in accordance with manufacturer's instructions.

B. Apply water repellant after pointing, patch, cleaning and inspection are completed.

END OF SECTION

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SECTION 05 12 00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 INCLUDED IN THIS SECTION

A. Preparation, repair and painting of steel lintels designated to remain. Coordinate brick masonry removals and reinstallation, and flashing work with the appropriate Sections.

B. Fabrication and installation of structural steel fittings

1.2 RELATED SECTIONS

A. Section 04 20 00 – Unit Masonry

B. Section 06 10 00 Rough Carpentry

1.3 REFERENCES

A. Comply with the following standard material specifications:

1. AISC - Code of Standard Practice - Manual of Steel Construction - Allowable Stress Design (ASD)
2. ASTM A992 - Structural Steel
3. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
4. ASTM A276, Type 304 – Stainless Steel Structural Shapes and Threaded Round Bar Stock.
5. ASTM A240, Type 304 – Stainless Steel Plate Stock.
6. ASTM A563 - Carbon and Alloy Steel Nuts
7. AWS A2.4 - Symbols for Welding, Brazing, and Nondestructive Examination.
8. AWS D1.1 - Structural Welding Code.

1.4 SUBMITTALS

A. Submit the following items to the Architect for review:

1. Shop Drawings of all fabrications showing field verified dimensions, locations, and connections to be made in the field.
2. Product literature for standard manufactured products and/or mass-produced items to be used

3. Mill test certificates for all tension rod materials and cast steel items indicating yield stress and ultimate failure stress of supplied materials.

1.5 QUALITY CONTROL

A. Comply with all referenced standards for the products employed.

B. Coordinate times of Architects and Engineer's Special On-Site Inspections.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL MATERIALS AND FABRICATIONS

A. Structural steel shall conform to "Specifications for Structural Steel Buildings" (AISC ASD 1989).

B. Structural steel shapes and plates shall conform with the following:

1. Rolled shapes: ASTM A992, Grade 50

2. Plates, rods and bars: ASTM A572, Grade 50

3. Pipe: ASTM A53, Grade B

4. Cast fittings: Available steel material to be submitted and approved by the Architect. Minimum properties shall meet or exceed those of ASTM A36.

5. Structural tubing (HSS): ASTM A500, Grade B

6. Bolts, nuts, and washers: ASTM A325 bolts, ASTM A563 nuts, Type 304 stainless steel for outdoor applications.

C. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.

D. Touch-up primer for galvanized surfaces: SSPC 20 Type I Inorganic or Type II inorganic

E. All structural steel fabrications exposed to weather shall be stainless steel to meet the requirements of ASTM A276, Type 304 or hot dip galvanized in accordance with ASTM A123.

F. All non-stainless, non-galvanized steel fabrications shall be painted with one coat of zinc rich primer equal or equivalent to TNEMC Series 10 shop primer.

G. All connections shall be fully welded with ¼" minimum fillet unless otherwise noted.

H. Cutting torch shall not be used in the field except with specific prior written permission.

I. Fabricate structural steel to proper field measurements before delivering to site.

2.2 RODS, ANCHORS AND ATTACHMENTS TO MASONRY AND CONCRETE CONSTRUCTION

A. Rods and anchors shall meet the requirements listed above for the appropriate interior or exterior application.

1. Pinning Rods shall be threaded over their entire lengths unless otherwise noted.

2. Field-drilled and set anchor bolts for steel installation to concrete construction shall be:

3. Threaded rod set with Hilti HY200 Adhesive to concrete unless otherwise noted.

4. Field-drilled and set anchor bolts for steel installation to masonry construction shall be: galvanized threaded rod set with Hilti HY270 Adhesive and Screen Tubes.

5. Pre-set anchor bolts for attachment to Masonry and Concrete shall be ASTM A307, threaded for their entire lengths.

2.3 WELDING ELECTRODES

A. Welding electrodes for new non-stainless steel shall be AWS E70-XX.

B. Welding electrodes for retrofit welding of existing steel members shall be AWS E60-XX, Low Hydrogen, specifically suited and field verified for compatibility with existing steel.

C. Welding electrodes for stainless steel shall be AWS “Stainless 304” compatible electrode.

2.4 PAINTING OF EXISTING STEEL

A. At existing steel lintels designated to remain paint existing exposed surfaces of steel with RD Coatings RD-Elastometal Primer and coat with RD-Mur Acryl Satin Top Coat, or approved equal. Color to be selected by Owner.

1. 2 coats of primer and one coat of top coat.

B. Paint for existing metal to be approved rust inhibitive primer and top coat such as TNEMEC 10 with color to be selected by Owner.

2.5 FLASHINGS AND ACCESSORY MATERIALS

A. Lead coated copper drip edge flashing.

B. Self adhesive rubberized asphalt membrane such as Grace Perm A-Barrier or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION AND ERECTION OF STRUCTURAL STEEL

A. Allow for erection loads, and for sufficient temporary bracing to maintain steel framing in a safe, plumb, and in true alignment until completion of erection and installation of permanent bracing connections.

B. Field-weld structural components only with written approval of Architect or where specifically indicated on the drawings.

C. Field-connect members with threaded fasteners; torque to required resistance per AISC Specification for Structural Joints Using ASTM A325 or A490 Bolts.

D. Do not field-cut or alter structural members without approval of the Architect.

E. After erection, prime welds, abrasions, and surfaces not galvanized, except surfaces to be in contact with concrete.

F. Provide and install Non-Shrink Grout under and behind steel bearing surfaces against masonry and concrete in accordance with the Contract Drawings and where required for uniform, full bearing against rough or canted masonry and concrete surfaces. Trowel grouted surface smooth, splay neatly to 45 degrees.

G. Structural Steel installation shall be done in consideration of median ambient temperatures and their effects on the alignment of the Steel Frame. Final tightening and adjustment of anchors to the existing structure shall not be done under extreme temperature conditions but shall be limited to when the temperature of the steel is between 40 degrees F and 70 degrees F.

H. Install all mechanically-set and adhesive-set drilled anchors in accordance with the respective product manufacturer’s instructions.

I. Coordinate work with the general contractor who shall be responsible for shoring of existing elements that may be supported by or temporarily in the way of the structural steel.

J. Coordinate removal finishes and wood construction as necessary for installation of structural steel, submitting a list of all necessary removals to the Architect/Engineer for review before proceeding with the work.

3.2 CLEANING, INSPECTION AND REPAIR OF EXISTING STRUCTURAL STEEL

A. Coordinate exposure of existing structural steel members and schedule an inspection with the Architect./Engineer

B. Cleaning: Cleaning shall be done in accordance with SSPC-SP-3 , “Power Tool Cleaning”: For Corroded Surfaces” For corroded surfaces steel shall be cleaned using SSPC-SP-3 to the extent that any mill scale, rust or paint remaining is adherent to steel.

C. Architect/Engineer shall determine the nature and extent of repair work which may involve cover plating or replacement and shall issue sketches showing the extent of

the work. Refer to Contract Drawings for additional information of repair work at various locations where structural steel repairs are anticipated.

1. All welding to existing members shall be done incrementally to avoid heating and yielding loaded members.

2. Remove all rust from weld locations and adjust welding voltage as needed where sections have thinned.

3. Follow the procedure described in AISC Engineering Journal “Field Welding to Existing Steel Structures”, attached, including testing, and review in field with Architect/Engineer before starting work.

4. Maintain proper support and bracing to all members during work.

D. Following work, clean and repaint members:

1. Remove all rust, dirt and scale from existing steel with scrapers and wire brushes until bare metal is completely exposed.

2. Paint steel surface with two coats of an approved rust inhibitive primer and top coat. Apply first coat to cleaned, dust-free steel within 30 minutes of exposure to the atmosphere. Follow manufacturer’s instructions for application.

3. Surfaces shall be kept dry and of at least 50 degrees F temperature during painting and 24 hour curing period.

3.3 FLASHING INSTALLATION AT LINTELS

A. Following the completion of structural steel repairs and repainting.

B. Install new lintel flashings at all locations.

1. Install lead coated copper drip edge along the bottom shelf of the lintel.

2. Provide self-adhesive membrane flashing to extend from edge of horizontal surface of the lead coated copper flashing, along the vertical leg of the lintel and extend a minimum of one brick masonry course or 2” beyond the top of the lintel. Secure with a termination bar at 8” o.c. or reglet into the back up masonry. Architect/Engineer to review condition and provide recommendation for the specific configuration.

3. At the limits of the openings, provide 2” vertical end dams.

4. Reset existing brick masonry soldier course, providing weeps at 24” o.c. or a minimum of 2 weeps per opening. Add mortar wash at top of the soldier course to shed water.

5. Coordinate with Section 04 20 00 and Section 07 62 00 for flashing and masonry work.

3.4 FIELD QUALITY CONTROL

A. Satisfy all applicable requirements of the Connecticut State Building Code.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Furnish material, labor, equipment, services necessary to erect all metal deck, including connections, welding and accessories required for installation of Work. Field cut and fit deck as required and cut all openings.

B. Place edge of deck at proper location to ensure proper placement of masonry. Set deck edge from a survey line based on the theoretical building line.

1.2 RELATED SECTIONS

A. 051200 Structural Steel

1.3 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

B. American Society Testing and Materials (ASTM) standards, latest editions.

1. A29 Standard Specification for Steel Bars, Carbon and Alloy, Hot-Wrought, General Requirements for

2. A36 Standard Specification for Carbon Structural Steel.

3. A108 Standard Specification for Steel Bars, Carbon, Cold-finished, Standard Quality.

4. A653 Standard Specification for Steel Sheet, Zinc- Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

5. A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coating.

6. A992 Standard Specification for Steel for Structural Shapes for Use in Building Framing

7. B633 Standard Specification for Electrodeposited coatings of zinc on iron and steel

C. "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", 9th edition including supplements. - American Institute of Steel Constructor's (AISC 335).

D. “Load and Resistance Factor Design Specification for Structural Steel Buildings” 2nd edition, including supplements. - American Institute of Steel Constructors (AISC LRFD 1999).

E. Seismic Provisions for Structural Steel Buildings (AISC 341-05).

F. "North American Specification for the Design of Cold- Formed Steel Structural Members" (Section BC 2209 of the 2008 NYC Building Code). - American Iron and Steel Institute (AISI).

G. Safety Requirements for Powder-Actuated Fastening Systems (ANSI A10.3), American National Standard (ANSI).

H. International Code Council Evaluation Service (ICC-ES):

1. International Building Code

2. Acceptance Criteria for Steel Deck Roof and Floor Systems (AC43)

3. Steel Deck Diaphragms (ESR-2199)

I. "Structural Welding Code - AWS D1.1" - American Welding Society (AWS).

J. "Specifications for Mild Steel Covered Arc - Welding Electrodes - AWS A5.1" - AWS.

K. "Diaphragm Design Manual for Floor Decks and Roof Decks" 3rd Edition - Steel Deck Institute (SDI).

L. "Fire Resistance Directory" - Underwriters Laboratory (UL).

1.4 DESIGN REQUIREMENTS

A. Design of metal deck is governed by Section BC 2209 of the 2008 NYC Building Code. Structural integrity requirements of the Section BC 2213.3 shall be met.

B. Metal deck unit sizes and gages are indicated on the Drawings.

C. Units shall be of three-span length except where framing layout does not permit. Deck sheets shall be butted over supports.

D. Provide shoring where required by the deck manufacturer as indicated on the approved shop drawings and where indicated on the Contract Documents.

E. Use of integral and non-piercing hanger tabs to support ceiling systems is not permitted. Piercing hanger tabs with a safe working loading of 250 lbs or greater are permitted for ceilings weights below the hanger tab capacity. Integral hanger tabs are to be used for venting purposes only.

F. Units included in a fire rated assembly must be classified in appropriate UL designs or have MEA, BSA, or OTCR approval.

G. Use fasteners or welds for decking attachment that provide adequate diaphragm shear strength, uplift resistance and stiffness for imposed load combinations.

H. Performance Requirements: FM classified Class I-90 minimum for uplift resistance and UL fire classified for roof deck.

1.5 SUBMITTALS

A. Product Data - Submit manufacturer's specifications for:

1. Shear stud connectors
2. Deck Fasteners, if used

B. Shop Drawings

1. Prepare metal deck shop drawings immediately after award of Contract.
2. Shop drawings shall include, but not be limited to the following:
    a. Type and gage of metal deck.
    b. Metal deck layout and orientation, including clear indication where shoring is required.
    c. Welding or fastener types, sizes and pattern.
    d. Side and end details of metal deck.
    e. Supplementary framing details.
    f. Location of all openings and fittings.
    g. Shop finish.
    h. Size, location, and spacing of stud shear connectors, where required, for each beam.
    i. Designation of welding electrode strength to be used.
3. Shop drawings reviewed by the Engineer of Record for general conformity with the Drawings shall not relieve the Contractor or the metal deck supplier of responsibility for correctness of fit, quantities of materials, and adequacy of attachment details of deck and accessories to the structural steel. Deck must have UL or OTCR approval as part of the fire rated assembly. Approval of shop drawings does not absolve the Contractor of this requirement.
4. Calculations in accordance with ICC-ES AC 43 or SDI Design Method verifying diaphragm shear strength and stiffness: Submit calculations for the load tables of the metal deck supplied. Calculations shall be signed and sealed by a Professional Engineer licensed in the State of Connecticut.

C. Quality Control Submittals

1. Certificates

a. Submit notarized certificates from the manufacturers of the specified materials stating compliance with the applicable requirements set forth for all materials specified in this Section.
b. Furnish steel manufacturer's certificate certifying welders employed on the Work have met AWS qualifications within the previous twelve months.
c. Furnish proof that deck to be used is part of a UL, MEA, BSA, or OTCR approved fire-rated assembly if other than deck shown on Drawings.
d. Submit certificate stating deck manufacturer is a member producer of SDI.

2. Manufacturers' Instructions: Furnish manufacturers' printed material, specifications and installation instructions for each type of decking, accessories, and studs.

3. Contractor Qualifications

1.6 PROVIDE PROOF OF MANUFACTURER, ERECTOR, WELDER, AND MECHANICAL FASTENER TECHNICIAN QUALIFICATIONS SPECIFIED UNDER "QUALITY ASSURANCE".

A. Surveys - Submit signed and sealed copies of surveys conducted by a Licensed Land Surveyor showing locations of edge of deck with respect to theoretical edge of deck and building survey line.

1.7 QUALITY ASSURANCE

A. Qualifications

1. Manufacturer: Company specializing in the manufacture of metal deck as used in this Contract shall have a minimum of five years experience and is a member producer of SDI.

2. Erector: Company specializing in performing the Work of this Section shall have a minimum of three years experience and have done at least three projects with similar quantity of material.

3. Welders: All steel roof deck welders shall be AWS certified for welding of sheet steel and NYC licensed.

4. Mechanical Fastener Installer: Shall be certified or licensed by the fastener and tool system manufacturer on the project site in accordance with ANSI A10.3 requirements. Certification or licensing includes all training necessary for proper tool operation, fastener selection, maintenance and troubleshooting.

B. Regulatory Requirements

1. Building Code: Work of this Section shall conform to all requirements of the Connecticut Building Code and all applicable regulations of other governmental authorities. Where more severe requirements than those

contained in the Building Code are given in this Section, the requirements of this Section shall govern.

2. Industry Standards: Standards specified herein shall apply to Work of this Section. Where more severe requirements then those contained in the standards are given in this section or the Building Code, requirements of this Section or the Building Code shall govern.
    a. AISC Steel Construction Manual
    b. Seismic Provisions for Structural Steel Buildings AISC 341-05.
    c. "Rules for Design of Composite Construction with Metal Decks or Lightweight Concrete" - Department of Buildings.
    d. Fire Resistance Directory - UL.

3. Recommendations or suggestions in the codes and references listed in this Article and under “References” shall be deemed to be mandatory unless they are in violation of the Building Code.

C. Certifications

1. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver deck to site undamaged. With each deck unit bearing the UL label and marking for specific system detailed.

B. Store deck units off the ground with one end elevated to provide drainage. Protect units from the elements with a waterproof covering.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel for Composite Metal Deck

1. Formed from galvanic steel sheets conforming to ASTM A653. Size of deck is to follow SDI requirements for thickness and tolerances.

2. Minimum yield strength of 33,000 psi.

3. Formed with integral locking lugs.

4. Formed with deformations to provide bond with concrete.

5. Deck to receive sprayed fireproofing shall be free of lubricants or oils that would impair the adhesion of the fireproofing material.

6. Metal deck that is not exposed to view with architectural paint finish shall have integral hanger tabs providing an approximate 0.5% uniformly distributed open area. The hanger tabs are used for venting purposes only.

B. Steel for Roof Deck

1. Formed from galvanic steel sheets conforming to ASTM A653. Size of deck is to follow SDI requirements for thickness and tolerances.

2. Minimum yield point of 33,000 psi.

3. Deck to receive sprayed fireproofing shall be free of lubricants or oils that would impair the adhesion of the fireproofing material.

C. Miscellaneous Steel Shapes Shall conform to the requirements of ASTM A36 or A992. Members to receive sprayed fireproofing shall be unprimed and free of lubricants or oils that would impair the adhesion of the fireproofing material.

D. Shop Finish

1. Metal deck: Steel sheet shall receive before being formed a coating of zinc conforming to ASTM A653 coating class G60 (both sides). Metal deck exposed to view, such as in the gymnasium, shall be cleaned and phosphatized prior to priming. Primer shall be applied in the shop and shall be structural steel primer paint applied at a rate of 0.6 Mils DFT minimum). Salt spray resistance of paint shall be 100+ hours when tested in accordance with ASTM B117.

2. Steel roof deck: Steel sheet shall receive before being formed a coating of zinc conforming to ASTM A653 coating class G90 (both sides). Roof deck exposed to view, such as in the gymnasium, shall be cleaned and phosphatized prior to priming. Primer shall be applied in the shop and shall be structural steel primer or coil coating paint applied at a rate of 0.6 Mils DFT minimum). Salt spray resistance of paint shall be 100+ hours when tested in accordance with ASTM B117.

3. Metal Deck Accessories (cants, pour stops, closure pieces, etc.) Shall conform to the requirements of ASTM A653, coating class G60. Unless a thicker gage is required by design considerations, such as at cantilever edge conditions, minimum thickness shall be same gage as metal deck. Accessories to receive sprayed fireproofing shall be free of lubricants and oils that would impair the adhesion of the fireproofing material.

E. Welds:

1. Material: Welding electrodes shall conform to either E60XX or E70XX classification of AWS A5.1 as selected by the licensed welder depending on the gauge of steel deck and strength of steel member being welded to and is subject to approval by the Engineer of Record.

2. Weld Washers: Use on steel roof deck thinner than 22 gauge

F. Mechanical Fasteners:

1. Material: AISI 1070 modified

2. Hardness: Minimum Rockwell Hardness C 54.5

3. Design and Manufacture: Knurled shank with forged ballistic point. Manufacturing process shall ensure steel ductility and prevent development of hydrogen embrittlement.

4. Washers: 1) For structural steel framing: Minimum15 mm (0.591 in.) steel washers; 2) For steel bar joist framing: Minimum 12 mm (0.472 in.) steel washers.

5. Corrosion Resistance:
    a. For steel roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B 633 SC1 Type III

6. Design Requirements:
    a. ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness
    b. FM wind uplift resistance
    c. UL fire classification

7. Approved Types
    a. For use with structural steel framing supports with top flange thickness 1/4 in. or thicker: 1) Hilti X-ENP-19 L15 (1/4 in. or thicker); 2) ITW/Ramset SP
    b. For use with steel bar joist supports with top chord or flange thickness 1/8 in. to 3/8 in.: 1) Hilti X-EDNK22 THQ12 (1/8 in. up to and including 1/4 in.); 2) Hilti X-EDN19 THQ12 (3/16 in. up to and including 3/8 in.); 3) ITW/Ramset 1500K and 1600WK.

G. Sidelap Connectors

1. Acceptable types of sidelap connectors:
    a. Top or side seam welds: 1½" long fillet welds in accordance with AWS D1.3 procedures.

2. Mechanical sidelap connectors
    a. Drive mechanical sidelap connectors completely through adjacent lapped roof deck sheets to achieve positive engagement of adjacent sheets with a minimum of three thread penetration.
    b. Material: ASTM A 510 Grade 1022
    c. Hardness: Minimum Vickers Surface Hardness of 450 HV0.3
    d. Design and Manufacture: Hex washer head undercut with reverse serrations; self- piercing or stitch point at center

3. Corrosion Resistance:
    a. For steel roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B 633 SC1 Type III.
    b. For exposed steel roof decks: AISI 410 or 304 stainless steel with bonded neoprene washer.

4. Design Requirements:

a. ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness
b. FM wind uplift resistance

5. Approved Types
   a. Hilti Connector
   b. Hilti Connector
   c. Hilti Stainless Steel Screw
   d. Elco Textron

6. Button punches
   a. Standard or proprietary type button punches shall be deep and positively engage the male and female side edges of adjacent interlocking deck sheets in accordance with steel deck manufacturer recommendations
   b. Approved Types: 1) Wheeling Corrugating Gator Crimp; 2) Verco Manufacturing Punchlok

H. Galvanizing Repair Paint Shall conform to the requirements of ASTM A780 and comply with Military Specification MIL-P-21035.

I. Deck Fasteners (if used) Deck fasteners of a type that will provide equal or greater uplift resistance than a 3/4" puddle weld.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin placement of metal deck until all surfaces and members are deemed acceptable to receive the deck. Do not proceed with Work until any unsatisfactory conditions have been corrected to the satisfaction of the deck installer.

3.2 ERECTION

A. General

1. Care should be taken to avoid overloading the supporting structural elements when placing bundles of metal deck or other construction loads on floors and roof.

2. Do not use floor deck units for storage or working platforms until they are permanently secured.

3. Employ a Licensed Professional Engineer or Land Surveyor to ensure accurate erection of the deck and end closures.

B. Metal Deck and Accessories Installation

1. Lay units in strict accordance with manufacturer's instructions and requirements and as shown on Drawings.

2. Adjust units in place before permanent fastening and accurately align end to end. Rectify inaccuracies in alignment and level of bearing before units are finally placed.

3. Provide proper bearing at all supports. Metal deck must be placed to bear fully on surface of beam flanges.

4. Provide angle and channel supports for metal deck at locations where deck cannot be properly seated due to obstructions by structural connections and as shown on Drawings. Coordinate with mechanical trades to adjust supports at columns if required to permit items to pass adjacent to column.

5. Anchor deck to steel member by welding directly through the bottom of the rib at all structural supports by welds not less than 3/4" in diameter or by using powder driven fasteners of equivalent strength, spaced not more than 12" across the width of the unit. All welds shall be of uniform size and appearance and free of pinholes, porosity, undercutting or other defects. Welds shall be free of sharp points or edges. Mechanical fasteners shall be fully engaged and washer snug and holding deck without damage. Where two units abut, each unit shall be so fastened to the steel framing. Add additional welds or fasteners where found defective.

6. Fasten side laps of adjacent units between supports by crimping or mechanically fastening with sheet metal screws of size and spacing required by manufacturer or as indicated on the Drawings to provide diaphragm strength required by seismic design. In no case shall fasteners exceed two feet. Fasteners for exposed to view roof deck shall be the minimum length possible to ensure an aesthetic appearance.

7. Furnish, install, and weld in position all accessories, including pour stops, closures, cant strips, etc., where required.

   Furnish sheet metal pour stops and closures for open ends of all cell raceways at columns, walls, and openings shown on Drawings. Pour stop gage is to be selected by manufacturer based on overhang. Revise gage if survey shows overhang exceeds that designed. Provide additional supports to strengthen pour stop at wedge inserts if required.

   a. Provide sheet steel cover plate (or closure tape) as required to close panel end conditions where panels change direction or abut.
   b. Furnish material for column closures to close openings between panels and structural columns.
   c. Provide welding hole cover, with friction fastening, to close welding access holes when required.
   d. Provide smooth form wood edge at locations where edge of deck will be exposed to view, such as at stairwells.

C. Cutting, Drilling, and Reinforcing of Openings

1. Where predetermined openings (such as stairs, elevators, etc.) are framed by structural steel beams on all sides (shown on the Drawings), the metal deck shall be engineered by the manufacturer to fit these conditions.

2. Any opening which is not framed by structural steel beams on all sides, and which is required in steel decking, shall be cut by the respective trades requiring it.

3. Reinforcing of Openings in Steel Deck
    a. Holes 6" or less in dimension need not be reinforced.
    b. Holes greater than 6" but less than 30" in any dimension shall be reinforced by the General Contractor as shown on the Structural Contract Drawings.

D. Field Touch Up

1. Clean scarred and rusted areas in galvanizing after deck installation is completed and paint welds and the scarred and rusted areas with the galvanizing repair paint. Apply in accordance with the manufacturer's instructions.

3.3 TOLERANCES

A. Edge of metal deck is to be within a tolerance of 1/4” of theoretical, set to a survey line, to ensure proper installation of masonry and installation of relieving angles. Where deck is found to be out of tolerance, make corrections and resurvey prior to placement of concrete.

3.4 FIELD QUALITY CONTROL

A. Welding/fastening of metal deck and shear studs is subject to Special Inspection and Testing and includes, but is not limited to:

1. Weld sizes and pattern.

2. Mechanical fastener placement location and washer condition.

3. Attachments of steel roof deck to supporting steel framing

B. Contractor’s Surveys Provide survey of locations of edge of deck with respect to theoretical edge of deck and building survey line. Indicate discrepancies between actual installation and Contract Documents. Surveys are to be submitted in a timely manner such that corrections can be made prior to placement of concrete. Do not proceed with placing concrete until the pour stop locations are corrected.

3.5 CLEANING

A. Metal deck and accessories to receive sprayed fireproofing shall be clean of dust, grease, excessive oils, loose materials, and any other matter which would impair the adhesion of the fireproofing material to the deck and accessories.

END OF SECTION

METAL FABRICATIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Steel pipe and tube handrails, balusters, and fittings.
B. Entrance canopy steel pipe, tube, plate, clevis, threaded rod and fittings

1.2 RELATED SECTIONS
A. Section 06 43 00 – Wood Stairs
B. Section 09 91 00 - Painting: Paint finish.

1.3 REFERENCES
A. ASTM A36 – Structural Steel
B. ASTM A307 - Low-Carbon Steel Externally and Internally Threaded Fasteners.
C. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
D. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
E. ASTM E935 - Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
F. ASTM E985 - Permanent Metal Railing Systems and Rails for Buildings.
G. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
H. FS TT-P-641 - Primer Coating, Zinc Dust-Zinc Oxide (for Galvanized Surfaces.
I. FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type

1.4 DESIGN REQUIREMENTS
A. Railing assembly, wall rails, and attachments to resist lateral force of 300 lbs at any point without damage or permanent set. Test in accordance with ASTM A935.

B. Fabricate railing assembly, wall rails, and attachments to ASTM E985.

1.5 SUBMITTALS FOR REVIEW
A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

PART 2 – PRODUCTS

2.1 STEEL RAILING SYSTEM
A. Steel Sections: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Rails and Posts: 1½" square steel tubing, ¼" x 1" flat bar steel and ½" dia. round bars; welded joints.

D. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast or machined steel.

E. Mounting: brackets and flanges, with steel brackets for embedding in masonry.

F. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

G. Splice Connectors: Steel concealed spigots.

H. Bolts, Nuts, and Washers; ASTM A307.

I. Welding Materials: AWS D1.1; type required for materials being welded.

J. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

K. Primer: FS TT-P-31, brown; for shop application and field touch-up.

L. Touch-up Primer for Galvanized Surfaces: FS TT-P-641 and TT-P-645

2.2 FABRICATION

A. Verify dimensions on site prior to shop fabrication.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Provide anchors, plates and angles required for connecting railings to structure.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

H. Interior Components: Continuously seal joined pieces by continuous welds.

I. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

J. Accurately form components to suit stairs and landings, to each other and to building structure.

K. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

PART 3 – EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be embedded in masonry with setting templates, to appropriate sections.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects.

C. Anchor railings to structure with anchors and plates.

D. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.

E. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

F. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per storey, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.5 SCHEDULE

A. Refer to details on drawings.

END OF SECTION

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ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.

B. Related Sections include the following:

1. Section 06 16 00 – Sheathing
2. Section 06 17 53 – Shop Fabricated Wood Trusses

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to

Project site.

5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Power-driven fasteners.
5. Powder-actuated fasteners.
6. Expansion anchors.
7. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

B. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1. Dimension lumber framing.
2. Timber.
3. Rim boards.
4. Miscellaneous lumber.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA UC4A.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Maximum Moisture Content 19 percent.

B. Ceiling Joists (Non-Load-Bearing): No. 2 grade or better, any of the following species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.
4. Douglas fir-larch (north); NLGA.
5. Mixed southern pine; SPIB.
6. Spruce-pine-fir; NLGA.
7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-south; WWPA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
10. Northern species; NLGA.
11. Eastern softwoods; NeLMA.
12. Western woods; WCLIB or WWPA.

C. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade or better, any of the following species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.
4. Mixed southern pine; SPIB.
5. Spruce-pine-fir; NLGA.
6. Douglas fir-south; WWPA.

7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-larch (north); NLGA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber with 19 percent maximum moisture content of any species.

C. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber with 19 percent maximum moisture content and any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB, or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

D. For exposed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
2. Mixed southern pine, No. 2 grade; SPIB.
3. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
4. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

E. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 3 grade; SPIB.
2. Hem-fir or hem-fir (north), Standard or 3 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir, Standard or 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods, No. 3 Common grade; NeLMA.
5. Northern species, No. 3 Common grade; NLGA.
6. Western woods, Standard or No. 3 Common grade; WCLIB or WWPA.

F. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade

lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

G. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

H. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2

2.7 METAL FRAMING ANCHORS

A. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:

1. Alpine Engineered Products, Inc.
2. Cleveland Steel Specialty Co.
3. Harlen Metal Products, Inc.
4. KC Metals Products, Inc.
5. Simpson Strong-Tie Co., Inc.
6. Southeastern Metals Manufacturing Co., Inc.
7. USP Structural Connectors.

B. Allowable Design Loads: Provide products with allowable design loads, as published by

manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Shear wall panels: Equal to Simpson Strongwall panels of the size indicated on the Drawings.

D. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 0.040 inch thick with hemmed edges.

2.8 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.

E. Do not splice structural members between supports, unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of

same width as framing members and 2-inch nominal- thickness.

3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the 2005 Connecticut Building Code.

K. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

3.2 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring horizontally and vertically at 24 inches o.c.

C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SHEATHING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Structural floor and roof framing.

B. Built-up structural beams and columns.

C. Wall and roof sheathing

D. Subfloor sheathing and overlay.

1.2 RELATED WORK

A. Section 05 50 00 - Metal Fabrications

B. Section 06 10 00 – Rough Carpentry

1.3 REFERENCES

A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.

B. ANSI A135.4 - Basic Hardwood.

C. APA - American Plywood Association.

D. AWPA - American Wood Preservers' Association: Book of Standards.

E. FS - TT-W-571 - Wood Preservation: Treating Practices.

F. NFPA - National Forest Products Association.

G. SFPA - Southern Forest Products Association.

H. WCLIB - West Coast Lumber Inspection Bureau: Standard Grading Rules for West Coast Lumber.

I. WWPA - Western Wood Products Association.

J. AWPA (American Wood Preservers Association) C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.

K. AWPA (American Wood Preservers Association) C2 – Wood Preservative Treatment by Pressure Process.

1.4 QUALITY ASSURANCE

A. Lumber Grading Agency: Certified by ALSC.

B. Plywood Grading Agency: Certified by APA.

C. Compliance with: AWC-2005 National Design Specifications, 2001 Wood Frame Construction Manual & 2005 Special Design Provisions for Wind and Seismic Supplement.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable codes for size and type of fasteners requirements.

B. Conform to UL requirements to achieve rating indicated on drawings.

C. All products used shall not contain Formaldehyde.

D. Preservatives used shall not contain chromium or arsenic.

PART 2 – PRODUCTS

2.1 LUMBER MATERIALS

A. Lumber Grading Rules: WWPA.

B. Beam Framing: Douglas Fir species, #2 grade or better with Fb=1200 psi minimum, sizes per plans, kiln dried or surfaced dry with 19 percent maximum moisture content.

C. Joist Framing: Douglas Fir species, #2 grade or better with Fb=1200 psi minimum, sizes per plans, kiln dried or surfaced dry with 19 percent maximum moisture content.

D. Rafter Framing: Douglas Fir species, #2 grade or better with Fb=1200 psi minimum, sizes per plans, kiln dried or surfaced dry with 19 percent maximum moisture content.

E. Non-structural Light Framing: Douglas Fir species, #2 grade or better with Fb=1200 psi minimum, sizes per plans, kiln dried or surfaced dry with 19 percent maximum moisture content.

F. Studding: Douglas Fir species, #2 grade or better with Fb=1200 psi minimum, sizes per plans, kiln dried or surfaced dry, 19 percent maximum moisture content.

2.2 PLYWOOD MATERIALS

A. Roof Sheathing: APA Structural I, Grade C-D; unsanded, fire retardant where noted.

B. Floor Sheathing: APA Structural I, Grade C-D; unsanded.

C. Underlayment: APA Structural I, Grade C-D; sanded.

2.3 SHEATHING AND UNDERLAYMENT LOCATIONS

A. Flat Roof Sheathing: 3/4-inch thick, 48 x 96 inch sized sheets, square edges.

B. Floor Sheathing: 3/4-inch thick, 48 x 96 inch sized sheets, square edges.

C. Floor Underlayment: 3/8-inch thick, 48 x 96 inch sized sheets.

2.4 ACCESSORIES

A. Fasteners: Hot-dipped galvanized steel for exterior, high humidity, and treated wood locations; plain finish elsewhere; size and type to suit condition.

B. Anchors and Connectors: As shown on the Drawings; manufactured by TECO or Simpson. Where connectors or anchors are not noted, provide appropriate galvanized items.

C. Joist Hangers: Galvanized steel, sized to suit joists and framing conditions; manufactured by TECO or Simpson.

D. Anchors: Adhesive expanding bolt type for anchorage to masonry. Bolts or ballistic fasteners for anchorage to steel.

E. Sill Gasket: 1/4 inch thick, plate width; 6 inch wide; glass fiber strip.

F. Subfloor Glue: Waterproof, air cure type, cartridge dispensed; manufactured by DAP.

2.5 WOOD TREATMENT

A. Fire retardant: AWPA UCFB, Exterior Type, chemically treated and pressure impregnated; capable of providing a maximum flame spread/smoke development rating of 0 to 75.

B. Wood Preservative (Pressure Treatment): AWPA UC4A using water borne preservative with 0.25 percent retainage.

C. Wood Preservative (Surface Application): green colored, manufactured by Osmose.

PART 3 – EXECUTION

3.1 FRAMING

A. Erect wood framing members level and plumb.

B. Place horizontal members laid flat, crown side-up.

C. Construct framing members full length without splices.

D. Double members at openings over one sq ft. Space short studs over and under opening to stud spacing.

E. Construct double joist headers at floor and ceiling openings. Frame rigidly into joists.

F. Construct double joists under wall studding.

G. Bridge framing in excess of 8 feet (2.3 m) span at mid-span members. Fit solid blocking at ends of members.

H. Place sill gasket directly on foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

I. Coordinate installation of wood decking, glue laminated and plywood web joists.

J. All wood contact with concrete or masonry to be pressure treated.

3.2 SHEATHING

A. Secure roof sheathing perpendicular to framing members with ends staggered. Secure sheet edges over firm bearing.

B. Secure wall sheathing horizontally perpendicular to wall studs, with ends staggered, over firm bearing.

C. Secure subfloor perpendicular to floor framing with end joints staggered. Secure sheet edges over firm bearing. Attach sheathing with subfloor glue and drywall screws.

D. Install plywood to simple span.

E. Tape all horizontal & vertical joints between wall Sheathing panels.

F. Secure flooring underlayment after dust and dirt generating activities have ceased and prior to application of finished flooring. Apply perpendicular to subflooring. Stagger end joints of underlayment. Secure with screw type fasteners.

3.3 TOLERANCES

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

B. Surface Flatness of Floor: 1/4 inch in 10 feet maximum.

END OF SECTION

SECTION 06 17 33

WOOD I-JOISTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Wood chord and plywood web joists for roof and floor framing.

B. Bridging, bracing and anchorage.

C. Framing for openings.

D. Misc. Steel Brackets and Fasteners.

1.2 RELATED SECTIONS

A. Section 03 30 00 - Concrete: Setting anchors in concrete.

B. Section 04 22 00 – Concrete Wall Unit Masonry: Setting anchors in masonry.

C. Section 06 10 00 –Rough Carpentry

1.3 REFERENCES

A. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.

B. APA (American Plywood Association).

C. AWPA (American Wood Preservers Association) C2 - Timber, Timbers, Bridge Ties, and Mine Ties - Preservative Treatment by Pressure Processes.

D. NFPA (National Forest Products Association).

E. SPIB (Southern Pine Inspection Bureau).

F. WCLIB (West Coast Lumber Inspection Bureau).

G. WWPA (Western Wood Products Association).

1.4 SYSTEM DESCRIPTION

A. Design Floor Live = 100 lbs/sq ft. All live load deflections limited to 1/480.

1.5 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Product Data: Provide joist configurations, bearing and anchor details, bridging and bracing.

C. Shop Drawings: Indicate sizes and spacing of joists, fastener description and spacings, loads and joist cambers, framed openings and submit design calculations. Shop drawings to be stamped by a structural engineer licensed in the State of Connecticut.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:

1. Lumber Grading Agency: Certified by ALSC.

2. Plywood Grading Agency: Certified by APA.

B. Maintain one copy of document on site.

C. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

D. Design joists and associated components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Connecticut.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for loads, seismic zoning, and other governing load criteria.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. Section 01 66 00 - Material and Equipment: Transport, handle, store, and protect products.

B. Protect structural components from warping or other distortion by stacking in vertical position, braced to resist movement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Georgia Pacific.

B. Trus-Joist Corporation.

C. Wood Fabricators, Inc.

D. Substitutions: Under provisions of Section 01 25 00.

2.2 MATERIALS

A. Lumber Grading Rules: NFPA, SPIB, WWPA.

B. Wood Chord Members: Single top and bottom chord, 19 percent maximum moisture content. Finger scarfing not permitted.

C. Plywood Web: APA Structural I, Grade C-D; unsanded.

D. Joist Bridging: Type, size and spacing recommended by joist manufacturer.

2.3 ACCESSORIES

A. Adhesive: Manufacturer's standard.

B. Wood Blocking: In accordance with Section 06114. Softwood lumber, construction grade, maximum moisture content of 19 percent.

C. Fasteners and Anchors:

1. Fasteners: Hot dipped galvanized steel.

2. Anchors: Toggle bolt type for anchorage to hollow masonry. Adhesive shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

D. Bearing Plates: Plain steel.

2.4 FABRICATION

A. Fabricate joists to achieve structural requirements specified.

B. Brace members for support during transit.

C. Provide bottom and top chord extensions as indicated.

D. Fabricate to achieve minimum nominal end bearing of:

1. 4 inches on steel & wood.

2. 8 inches on masonry.

E. Frame special sized openings in web as detailed, per manufacturer’s instructions and as required to meet building code requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that supports and openings are ready to receive joists.

3.2 PREPARATION

A. Coordinate placement of support items.

3.3 ERECTION

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

B. Set structural members level and plumb, in correct position.

C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.

D. Do not field cut or alter structural members without approval of Architect/Engineer.

E. Place headers and supports to frame openings.

F. Frame openings between joists with lumber in accordance with Section 06 16 00.

G. Coordinate placement of sheathing with work of this section.

3.4 ERECTION TOLERANCES

A. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION

GLUED-LAMINATED WOOD DECKING

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Wood decking.

1.2 RELATED SECTIONS
A. Section 06 10 00 – Rough Carpentry

B. Section 07 21 13 - Board Insulation.

1.3 REFERENCES
A. ANSI/AITC A190.1 - Standard for Dimensions of Structural Glued Laminated timber.

B. ASTM D 2559 - Standard Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 33 00 – Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Technical data indicating compliance with specifications and standards.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Certification: Submit certification that the decking size specified will meet the specified design wind pressure and snow loads.

1.5 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in providing products of the type specified in this section, with minimum of 5 years documented experience with products in use.

B. Manufacturing Standard: Conform to ANSI/AITC A190.1.

C. Labeling Requirements: Each length of lumber shall be stamped at the mill indicating certification mark, mill identification, grade name, and inspection certificate. All labels shall be placed on surfaces where it will not be exposed to view when installed.

1.6 PERFOMANCE REQUIREMENTS
A. Design Wind Pressure: As indicated on the Drawings.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Disdero Lumber Co., which is located at: 12301 S. E. Carpenter Dr.; Clackamas, OR 97015; Toll Free Tel: 800-547-4209; Tel: 503-239-8888; Fax: 503-607-2492; Email:request info (gbrinck@disdero.com); Web:http://www.lockdeck.com|http://www.disdero.com

B. Substitutions: Permitted in accordance with the procedures outlined in 01 25 00 Substitution Procedures.

2.2 MATERIALS

A. Laminated: Decking: Lock-Deck Laminated Decking.
   1. Species: Western Red Cedar.
   2. Grade: Decorative.
   3. Pattern: Standard Vee.
   4. Tongue-And Groove Edges: Center laminations shall be offset and machined to form a tongue and groove on both the edges.
   5. Ends: End matched (tongue-and-groove).
   6. Ends: Square end.
   7. Random Length Continuous Spans: 6' to 16', shipped in multiples of 1 foot and 1 inch short of nominal.
   8. Nominal Size: 3x6.
   9. Surface Texture: Smooth Sanded.
   10. Moisture Content: 10% to 12% average, maximum 15%.
   11. Laminating Adhesive: Exterior 100 percent waterproof type, meeting ASTM D 2559. Laminated decking shall be cured under pressure using high frequency electronics in a radio frequency (RF) press.
   12. Quality Control: Manufactured in accordance with ANSI/AITC 190.1 and certified by an independent inspection agency.
   13. Factory Finish - Stain: One coat of factory-applied, oven-dried acrylic, semi-transparent stain with mildewcide/fungicide.
       a. Color as selected by architect from manufacturer standard color.
   14. Factory Finish - Clear Sealer: Semi-gloss finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install deck with tongue up on all sloped surfaces.

3.4 PROTECTION

A. Store material on jobsite on blocking which raises material at least 6 inches above the ground. Cover material with vapor barrier with at least 2 inch air space for ventilation.

B. Protect installed products until completion of project. Cover decking with a single layer of roofing felt, lapped 4 inches minimum, immediately after installation.
   1. Use 15 pound felt for slopes 2:12 to 6:12.
   2. Use 30 pound felt for slopes over 6:12.

C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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WOOD STAIRS

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
1. Wood stairs.
2. Shop finishing of wood stairs.

1.2 RELATED SECTIONS
A. Section 05 52 00 - Metal Railings

1.3 ACTION SUBMITTALS
A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.4 INFORMATIONAL SUBMITTALS
A. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 DELEGATED DESIGN SUBMITTALS
A. Delegated Design Drawings: Fabricator shall be responsible for the design of the wood stairs and associated railing newel posts and shall provide signed and sealed drawings by the fabricators engineer of record.
1. Design Criteria: Live Load - 100lbs/SF, Dead Load 20lbs/SF.

1.6 QUALITY ASSURANCE
A. Fabricator Qualifications: Certified participant in AWI’s Quality Certification Program.

B. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

1.7 FIELD CONDITIONS
A. Environmental Limitations: Do not deliver or install wood stairs and railings until building is enclosed and wet work is complete.

PART 2 - PRODUCTS

2.1 WOOD STAIRS
A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

B. Grade: Custom.
   1. Stairs are to shop fabricated and field assembled.

C. Wood for Opaque Finish: Any closed-grain hardwood except that eastern white pine, sugar pine, or western white pine may be used for risers, stringers, and moldings.

D. Finishes for Stair Parts: As follows:
   1. Treads: Opaque.
   2. Risers: Opaque.
   3. Stringers: Opaque.
   4. Scotia, Cove, and Other Moldings: Opaque.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: **5 to 10** percent.

2.3 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Rough Carriages for Stairs: Laminated veneer lumber, made with an exterior-type adhesive complying with ASTM D 2559, and with the following allowable design values as determined according to ASTM D 5456: Verify properties of available products before retaining options in "Extreme Fiber Stress in Bending, Edgewise" and "Modulus of Elasticity, Edgewise" subparagraphs below.
   1. Extreme Fiber Stress in Bending, Edgewise: 2250 psi (15.5 MPa) for 12-inch nominal depth members.
   2. Modulus of Elasticity, Edgewise: 1,500,000 psi (10 300 MPa).

C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.4 FABRICATION

A. Fabricate wood stairs to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of Solid-Wood Members: 1/16 inch unless otherwise indicated

B. Complete fabrication, including assembly**,** finishing and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as

necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

C. Cut carriages to accurately fit treads and risers. Glue treads to risers, and glue and nail treads and risers to carriages.
   1. Fabricate stairs with treads and risers no more than 1/8 inch from indicated position and no more than 1/16 inch out of relative position for adjacent treads and risers.

2.5 SHOP FINISHING

A. General: Finish wood stairs and railings at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork.

C. Opaque Finish:
   1. Grade: Economy.
   2. Finish: System - 4, water-based latex acrylic.
   3. Color: As selected by Architect from manufacturer's full range].
   4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition wood stairs and railings to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

A. Grade: Install wood stairs to comply with same grade as item to be installed.

B. Stairs: Securely anchor carriages to supporting substrates. Install stairs with treads and risers no more than 1/8 inch from indicated position.

C. Touch up finishing work specified in this Section after installation of wood stairs and railings. Fill nail holes with matching filler where exposed.

END OF SECTION

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BOARD INSULATION

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Board Insulation.

1.2 RELATED SECTIONS
A. Section 04 20 00 – Unit Masonry
B. Section 07 53 23 - Elastomeric EPDM Sheet Roofing: Insulation in low-slope roofing applications.

1.3 REFERENCES
A. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
C. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
D. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
E. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C.
F. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
G. National Fire Protection Association (NFPA) Life Safety Code
H. Underwriters Laboratories (UL) - UL 2079 Standard test method for fire resistance of Building Joint Systems.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 33 00.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE
A. Manufacturer Qualifications: Manufacturer with a minimum of ten years' experience manufacturing products in this section shall provide all products listed.

B. Installer Qualifications: Products listed in this section shall be installed by a single organization with at least five years' experience successfully installing insulation on projects of similar type and scope as specified in this section.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Storage: Store materials in dry locations with adequate ventilation, free from water, and in

such a manner to permit easy access for inspection and handling.

C. Handling: Handle materials to avoid damage.

1.7 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07 27 26.02.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: CertainTeed Corp., Insulation Group, which is located at: 750 E. Swedesford Rd. P. O. Box 860 ; Valley Forge, PA 19482-0860; Toll Free Tel: 800-233-8990; Fax: 610-341-7940; Email: request info; Web: certainteed.com/CertainTeed/Pro/Design+Professional/Insulation

B. Kingspan Insulation, LLC, 2100 Riveredge Parkway #175, Atlanta, GA 30328; Tel: 800.241.4402; Web: www.trustgreenguard.com

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 APPLICATIONS

A. Exterior Concrete and Masonry Walls: Rigid board type applied to interior face.
   1. Thickness: As indicated on the Drawings.
   2. Vapor Retarder: Separate.

2.3 BOARD INSULATION

A. Commercial Board Insulation, Certainteed CertaPro Commercial Board. Complies with ASTM C 612. Composed of glass fibers bonded with a thermoset binder.
   1. Type CB 300: Board type conforming to ASTM C 612, Type 1A and 1B.
      a. Fire Hazard Classification: ASTM E 84:
         1) Maximum Flame Spread Index; 25.
         2) Maximum Smoke Developed Index; 50.
      b. Limited Combustible: NFPA 259 less than or equal to 3,500 Btu/lb
      c. Thickness: 2 inches (51 mm).
         1) NRC: 0.95 in accordance with ASTM C 423.
         2) Thermal Resistance: R of 8.7 (RSI 1.53).

   2. Type CB 600: Rigid board type conforming to ASTM C 612, Type 1A and 1B.

a. Fire Hazard Classification: ASTM E 84:
   1) Maximum Flame Spread Index; 25.
   2) Maximum Smoke Developed Index; 50.
b. Limited Combustible: NFPA 259 less than or equal to 3,500 Btu/lb.
c. Thickness: 2 inches (51 mm).
   1) NRC: 1.00 in accordance with ASTM C 423.
   2) Thermal Resistance: R of 9.1 (RSI 1.53).

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that all exterior and interior wall, partition, and floor/ceiling assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in ceilings, walls and floors have been installed and tested and, if appropriate, verify that adjacent materials are dry and ready to receive insulation.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

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

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

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Install insulation with vapor barrier installed facing the warm side. Seal or tape joints as required.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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STRUCTURAL THERMAL BREAK MATERIAL

PART 1 GENERAL

1.1. DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section including the following.

1. Structural thermal breaks fabricated from the following material:

a. Polyurethane (Armatherm 500-150)

1.2. RELATED SECTIONS

A. Section 06100 - Rough Carpentry

B. Section 07212 - Board Insulation

1.3. SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions.

B. Schedule: Submit a list of locations where structural thermal breaks are to be used, and the specific product and thickness to be used at each location.

C. Shop Drawings: Submit shop drawings showing details of construction, and relationship of structural thermal break material with adjacent construction including fastening and/or anchorage connection details, Armatherm thermal break material size and thickness.

1.4. QUALITY ASSURANCE

A. Manufacturer: Minimum of 5 years' experience producing similar products.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5. DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Storage and Handling: Comply with manufacturer's recommendations for storage and handling. Protect from weather damage.

1.6. WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing.

PART 2 PRODUCTS

2.1. MANUFACTURER

A. Basis-of-Design Manufacturer: Armatherm, 4 Middle Street, Fairhaven, MA 02719. Tel: 844-360-1036. Email: sales@armatherm.com. Web: www.armatherm.com.

2.2. POLYURETHANE THERMAL BREAKS

A. Structural Thermal Break Material: Armatherm 500-150 high-strength, polyurethane with the following attributes:

1. Compressive Strength: ASTM D1621 - 560 psi.
2. Compressive Modulus: ASTM D1621 - 18,130 psi.
3. Shear Strength: ASTM C273 - 167 psi.
4. Thermal Conductivity: ASTM C518 - 0.32 BTU in/ hr sf degree F.
5. Coefficient of Thermal Expansion: ASTM E831 - 33 x 10e-6 in/in/degree F.
6. Thermal Resistance (R value): ASTM C518 - 3.3 hr sf degree F/ BTU.
7. Accessories: Armatherm FRR bushings and washers as applicable to location. Armatherm washers shall be minimum 0.25 inch thick. Armatherm bushing and washer to provide thermal break between steel washer/bolt and internal structural steel.
8. Thickness: as indicated on the drawings.

PART 3 EXECUTION

3.1. EXAMINATION

A. Examine substrates for compliance with requirements for installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2. INSTALLATION

A. Install thermal breaks in accordance with manufacturer's instructions and approved submittals and the following:

1. Install in proper relationship with adjacent materials.
2. Include accessory products including bushings and washers.
3. Protect from damage until acceptance.

END OF SECTION

FLUID-APPLIED MEMBRANE AIR BARRIER

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes fluid-applied, vapor-permeable membrane air barriers.

1.2 RELATED REQUIREMENTS
A. Section 04 20 00 "Unit Masonry" for air barrier substrates and compatibility with flashing components.

1.3 REFERENCES
A. References, General: Versions of the following standards current as of the date of issue of the project apply to the Work of this Section.
B. Air Barrier Association of America (ABAA): www.airbarrier.org:
   1. ABAA Quality Assurance Program
C. ASTM International (ASTM): www.astm.org:
   1. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
   2. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials
   3. ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials
   4. ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
   5. ASTM E 783 - Standard Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors
   6. ASTM E 1186 - Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
   7. ASTM E 2178 - Standard Test Method for Air Permeance of Building Materials
   8. ASTM E 2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

1.4 ACTION SUBMITTALS
A. Product Data: For each type of air barrier product specified, including:
   1. Technical data indicating compliance with requirements.

1.5 INFORMATIONAL SUBMITTALS
A. Manufacturer's Product Compatibility Certificate: Certify compatibility of air barrier products with adjacent materials.

B. Fire Propagation Characteristics Certificate: From a qualified testing agency, documentation that air barrier system as a component of a wall assembly has been tested and passed NFPA 285. Include system classification number of testing agency on shop drawings.

C. Product Test Reports: Test data for air barrier products and air barrier assembly, by qualified testing agency, indicating proposed membrane air barrier meets performance requirements, when requested by Architect.

D. Warranty: Sample of unexecuted manufacturer and installer special warranties.

E. Field quality control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm with minimum three years' experience in installation of specified products in successful use on similar projects, employing workers trained by manufacturer.

B. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum five years' experience in manufacture of air barrier membrane as one of its principal products.
   1. Manufacturer's product submitted has been in satisfactory operation on five similar installations for at least five years.
   2. Manufacturer is accredited by the Air Barrier Association of America.
   3. Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
      a. Completed and signed Substitution Request form.
      b. Product data, including certified independent test data indicating compliance with requirements.
      c. Sample shop drawings from similar project.
      d. Project references: Minimum of five installations of similar system not less than five years old, with Owner and Architect contact information.
      e. Certificate of ABAA accreditation if required for Project.
      f. Sample warranty.

1.7 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in manufacturer's unopened original packaging.

B. Store products in weather protected environment, clear of ground and moisture, within temperature ranges recommended by air barrier manufacturer.

C. Construction Waste: Store and dispose of packaging materials and construction waste in accordance with requirements of Division 01 Section "Construction Facilities and Temporary Controls."

1.8 ENVIRONMENTAL REQUIREMENTS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
   1. Protect substrates from environmental conditions that affect air-barrier performance.
   2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.9 SCHEDULING

A. Coordinate installation of membrane air barrier with completion of work requiring interface with air barrier.

B. Schedule work so air barrier applications may be inspected prior to concealment.

C. Ensure air barrier materials are cured before covering with other materials.

1.10 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which air barrier manufacturer agrees to furnish and install air barrier material to repair or replace those materials installed according to manufacturer's written instructions that exhibit material defects or otherwise fail to perform as specified under normal use within warranty period specified.
   1. Access for Repair: Owner shall provide unimpeded access to the Project and the air barrier system for purposes of testing, leak investigation, and repair, and shall reinstall removed cladding materials upon completion of repair.
   2. Cost Limitation: Manufacturer's obligation for repair or replacement shall be limited to the original installed cost of the work.
   3. Warranty Period: 5 years date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of air barrier materials from the following:
   1. Movement of the structure caused by structural settlement or stresses on the air barrier exceeding manufacturer's written specifications for elongation.
   2. Mechanical damage caused by outside agents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Products: Provide air barrier products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing Division, An RPM Company, Beachwood OH; (866) 321-6357; email: techresources@tremcoinc.com; www.tremcosealants.com

B. Prosoco, Inc., 3741 Greenway Circle, Lawrence, KS 66046; 800.255.4255; www.prosoco.com

C. Approved equal as per Section 01 60 00.

2.2 MATERIALS, GENERAL

A. Source Limitations: Obtain air-barrier materials from single source from single manufacturer.

B. VOC Content: 250 g/L maximum per 40 CFR 59, Subpart D (EPA Method 24) and complying with requirements of authorities having jurisdiction.

C. Low-Emitting Products: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Compatibility: Provide membrane air barrier materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by membrane air barrier manufacturer based on testing and field experience.

2.3 PERFORMANCE REQUIREMENTS

A. General: Membrane air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a moisture drainage plane transitioned to adjacent flashings and discharging water to the building exterior. Membrane air barriers shall accommodate

substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without moisture deterioration and air leakage exceeding performance requirements.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

C. Fire Propagation Characteristics: Provide air barrier system qualified as a component of a comparable wall assembly that has been tested and passed NFPA 285.

2.4 MEMBRANE AIR BARRIER

A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, polymer-modified bituminous membrane, formulated for application no less than 40 mils (dry).
   1. Basis of Design Product: Tremco, Inc., ExoAir 230.
   2. Air Permeance, ASTM E 2178: 0.004 cfm/sq. ft of surface area at 1.57-lbf/sq. ft. pressure difference, maximum.
   3. Vapor Permeance, ASTM E 96/E96M: Minimum 12 perms.
   4. Elongation, Ultimate, ASTM D 412, Die C: 600 percent, minimum.
   5. Combustion Characteristics: Class A, flame spread, not greater than 25; smoke developed, not greater than 450, per ASTM E 84.
   6. UV Resistance, QUV-B: Over 160 cycles of UV and water spray with no observable deterioration.
   7. VOC Content: Less than 50 g/L.

B. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, polymer-modified bituminous membrane, formulated for application no less than 40 mils (dry).
   1. Basis of Design Product: Prosoco CAT5
   2. Air Permeance, ASTM E 2178: 0.004 cfm/sq. ft of surface area at 1.57-lbf/sq. ft. pressure difference.
   3. Vapor Permeance, ASTM E 96/E96M: Minimum 18 perms.
   4. Elongation, Ultimate, ASTM D 412, Die C: 250 percent, minimum.
   5. VOC Content: Less than 30 g/L

2.5 ACCESSORY MATERIALS

A. General: Accessory materials as described in manufacturer's written installation instructions, recommended to produce complete air barrier assembly meeting performance requirements, and compatible with air barrier membrane material and adjacent materials.

B. Primer: Liquid primer meeting VOC limitations, recommended for substrate by membrane air barrier manufacturer, when installing modified bituminous self-adhered membranes
   1. Basis of Design Product: Tremco, Inc., ExoAir Primer

C. Transitions:
   1. Counterflashing Strip: Modified bituminous, 40 mils thick self-adhering composite sheet consisting of 32 mils of SBS rubberized asphalt laminated to an 8 mils high-density, cross-laminated polyethylene film, for counterflashing of metal flashings and for substrate transitions and for termination of air barrier to bituminous roof membranes and to air barrier terminations at openings.
      a. Basis of Design Product: Tremco, Inc., ExoAir TWF Thru-Wall Flashing.

2. High Temperature Flashing Strip and Underlayment: Butyl, 24 mil thick self-adhering composite sheet consisting of 20 mils of butyl laminated to 4 mil polyethylene film; thermally stable under intermittent, non-continuous exposure up to 240 deg F.
   a. Basis of Design Product: Tremco, Inc., ExoAir 111.
3. Foil Flashing Strip: Butyl, 24 mil thick self-adhering composite sheet consisting of 20 mils of butyl laminated to 4 mil polyethylene film; thermally stable under intermittent, non-continuous exposure up to 240 deg F.
   a. Basis of Design Product: Tremco, Inc., ExoAir 111.
4. Butyl Strip: Butyl, 24 mil thick self-adhering composite sheet consisting of 20 mils of butyl laminated to 4 mil polyethylene film; thermally stable under intermittent, non-continuous exposure up to 240 deg F, for termination of air barrier to EPDM or TPO roof membranes.
   a. Basis of Design Product: Tremco, Inc., ExoAir 111
5. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
6. Opening Transition Assembly: Cured low-modulus silicone extrusion, with reinforcing ribs, sized to fit opening widths, [with aluminum race for insertion into aluminum framing extrusions,] with the following characteristics:
   a. Basis of Design Product: Tremco, Inc., Proglaze ETA Engineered Transition Assembly. Tear Strength: 110 lb/in (19.3 kN/m)
7. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with manufacturer's recommended silicone sealant for bonding extrusions to substrates.
   a. Basis of Design Product: Tremco, Inc.; Spectrem SimpleSeal.

D. Liquid Joint Sealants:
   1. ASTM C 920, single-component polyurethane, approved by air barrier manufacturer for adhesion and chemical compatibility with membrane air barrier and accessories.
      a. Basis of Design Product: Tremco, Inc., Dymonic 100.
   2. ASTM C 920, single-component, neutral-curing silicone, approved by air barrier manufacturer for adhesion and compatibility with membrane air barrier and accessories post installation of the membrane.
      a. Basis of Design Product: Tremco, Inc., Spectrem 1.

E. Sprayed Polyurethane Foam Sealant: Sprayed Polyurethane Foam Sealant: Foamed-in-place, 1.5- to 2.0-lb/cu. ft. (24- to 32-kg/cu. m) density, with flame-spread index of 25 or less per ASTM E 162, for filling of gaps at openings and penetrations.
   1. Basis of Design; Tremco Inc., Flexible Low Expanding Foam (LEF).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Surface Condition: Before applying air barrier materials, examine substrate and conditions to ensure substrates are fully cured, smooth, clean, dry, and free from high spots, depressions, loose and foreign particles and other deterrents to adhesion, and conditions comply with manufacturer's written recommendations.
   1. Verify concrete and masonry surfaces are visibly dry, have cured for time period recommended by membrane air barrier manufacturer, and are free from release agents, curing agents, and other contaminates.
   2. Test for capillary moisture by method recommended in writing by air barrier manufacturer.

3. Verify masonry joints are filled with mortar and struck flush.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INTERFACE WITH OTHER WORK

A. Commencement of Work: Commence work once air barrier substrates are adequately protected from weather and will remain protected during remainder of construction.

B. Sequencing of Work: Coordinate sequencing of air barrier work with work of other sections that form portions of building envelope air barrier to ensure that flashings and transition materials can be properly installed and inspected.

C. Subsequent Work: Coordinate air barrier work with work of other sections installed subsequent to air barrier to ensure complete inspection of installed air barrier and sealing of air barrier penetrations necessitated by subsequent work.

3.3 PREPARATION

A. Clean, prepare, and treat substrate in accordance with air barrier manufacturer's written instructions.
   1. Mask adjacent finished surfaces.
   2. Remove contaminants and film-forming coatings from substrates.
   3. Remove projections and excess materials and fill voids with substrate patching material.
   4. Prepare and treat joints and cracks in substrate per ASTM C 1193 and membrane air barrier manufacturer's written instructions.

3.4 APPLICATION OF ACCESSORY MATERIALS

A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions. Install transition material and other accessories to form connect and seal membrane air barrier material to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior fenestration systems, door framing, and other openings.

B. Primer: Apply primer to substrates when recommended by air barrier manufacturer at required rate for those substrates that will be receiving a modified bituminous self-adhered membrane. Reprime areas not covered within 24 hours.

C. Flashings: Seal top of through-wall flashings to membrane air barrier with a continuous bead of approved sealant recommended by air barrier manufacturer.

D. Seal punctures, voids, and seams. Patch with approved transition and accessory materials following air barrier manufacturer’s recommendations and extend repair beyond repaired areas to maintain continuity.

3.5 FLUID AIR-BARRIER MEMBRANE INSTALLATION

A. General: Apply fluid air-barrier material to form a seal with transition materials and accessories to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.

B. Membrane Air Barrier: Apply fluid air barrier material in full contact with substrate to produce a continuous seal with transition strips according to membrane air barrier manufacturers written instructions.
   1. Vapor-Permeable Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 40-mil dry film thickness, applied in one or more equal coats, roller-or spray- applied.

C. Seal punctures, voids, and seams. Patch with approved transition and accessory materials following air barrier manufacturer's recommendations and extend repair beyond repaired areas to maintain continuity.

D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.6 CLEANING AND PROTECTING

A. Clean spills, stains, and overspray resulting application utilizing cleaning agents recommended by manufacturers of affected construction. Remove masking materials.

B. Protect membrane air barrier from damage from subsequent work. Protect membrane materials from exposure to UV light for period in excess of that acceptable to membrane air barrier manufacturer; replace overexposed materials and retest.

END OF SECTION

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ELASTOMERIC EPDM SHEET ROOFING, FULLY ADHERED

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Elastomeric fully adhered sheet Membrane Roofing System with insulation to match new roof on existing building.

1.2 RELATED SECTIONS
A. Section 06 10 53 – Miscellaneous Rough Carpentry: Roof curbs
B. Section 06 15 00 – Wood Decking
C. Section 07 62 00 - Sheet Metal Flashing & Trim
D. Section 07 71 23 - Gutters and Downspouts.

1.3 SYSTEM DESCRIPTION
A. Elastomeric sheet membrane roof assembly including structure to conform to UL requirements for a Class C rated assembly, and FM Class I/ I-90 requirements for wind uplift resistance.

1.4 SUBMITTALS
A. Submittals shall be in accordance with Section 01 33 00, Paragraph Quality Assurance.

1.5 QUALITY ASSURANCE
A. Perform Work in accordance with Underwriters Laboratories Inc. UL Class C Fire Hazard Classification; Factory Mutual Engineering Corporation FM Roof assembly Classification wind uplift requirement of I90, FM Construction Bulletin 1-28, Class 1 Construction.

1.6 ENVIRONMENTAL REQUIREMENTS
A. Do not install membrane during inclement weather or when air temperature may fall below 50 degrees.

1.7 WARRANTY
A. Provide 15 year 'Total System" warranty under provisions of Section 01 40 00, Quality Control.

B. Provide 15-year warranty for labor.

PART 2 – PRODUCTS

2.1 MEMBRANE MATERIALS
A. Manufacturers:
   1. Carlisle System: Sure-White

B. Membrane: EPDM materials; non-reinforced .060-inch-thick, white color as selected. EPDM membrane shall conform to ASTM D-4637.

Physical Property	Test Method	Minimum Test Result
Color		White
Specific Gravity	ASTM D-297	1.12
Tensile Strength	ASTM D-412	1300 psi

Elongation at Break	ASTM D-412	300%
Tear Resistance (Die C)	ASTM D-624	175 lb./in.
Sheet Composition	ASTM D-297	
% Polymer that is EPDM		100
% Sheet that is Polymar		30

C. Cements and Primers:
1. Cements and Primers used for splicing, patching, and flashing shall be compatible with the membrane and substrate materials furnished, and shall be furnished by the same manufacturer as the membrane elastomer, and meet the manufacturer's published specifications for the same.
2. Any deviations from manufacturer's furnished products must be approved in writing by the manufacturer and accepted by the Architect prior to installation.

D. Flashings:
1. General: Flashings shall be as approved by manufacturer to comply with their 15 year "Total System" warranty.
2. Elastomeric Flashing: Elastomeric flexible flashing shall be furnished in uncured condition and shall meet or exceed the following test values:

Property	Test Method	Test Value
Test Strength	ASTM D-412	1200 psi
Elongation @ break	ASTM D-412	400%
Brittleness Temperature	ASTM D-746	-40°C
Tear Resistance Die C	ASTM D-624	140 lb./in.
Resistance to Ozone	ASTM D-1149	No Cracks

E. Pre-Fabricated Flashing Accessories:
1. Molded Pipe Flashing - white , cured, pre-cast base flashing for pipes and conduit up to 6" in diameter installed with splicing cement and seam sealant. Provide in sizes as necessary and supply with stainless steel clamp. Install in accordance with manufacturers' requirements, clamp tightly and apply sealant to top of neck.
2. Physical Properties - cured prefabricated flashing shall meet the same properties as non-cured flashings.

2.2 MEMBRANE FASTENING

A. SEALANTS:
1. Lap sealant shall be a one-part elastomeric caulking/adhesive sealant furnished by elastomeric membrane manufacturer according to his latest published catalog. Shelf life shall be marked clearly on container: "Do not use after _____;" and use will not be permitted of expired material. Store and apply according to manufacturer's installation instructions.
2. Sealant for difficult to flash penetrations or objects shall be an elastomeric, pourable material furnished by membrane manufacturer according to his latest published catalog. Shelf life shall be marked clearly on containers: "Do not use after _____;" and use will not be permitted of expired material. Store and apply according to manufacturer's installations instructions.
3. Water cut-off sealant is to be used for end of day stopping point and shall be an elastomeric sealant to adhere and seal space at edge of membrane and substrate. It will be furnished by elastomeric membrane manufacturer and meet their latest

published catalog requirements. Store and apply according to manufacturer's installation instructions.

4. Other sealers, tack coats, and tapes used shall be compatible to the elastomeric membrane and shall be as furnished and recommended by membrane manufacture. Use shall be according to manufacturer's recommendations and within the shelf life period designated on the containers. Asphalt or coat tar derivative products are not to be use in this construction.

B. FASTENERS:
   1. Fasteners shall be as recommended by the elastomeric membrane manufacturer for the type of deck, type and thickness of insulation, and fastening requirements of the manufacturer's system, UL, local building code or insurance requirements, whichever is most stringent.
   2. Fastener spacing shall meet FM approval Guide for I-90 Zone I windstorm rating when used with the selected insulation.
   3. Fasteners shall be galvanized steel or other non-corroding material employing plastic washers of a size recommended by the EPDM manufacturer. Washers, batten strips, and metal flashings or clips will be protected from contact with dissimilar metals in fasteners or companion accessories to preclude electrolytic corrosion.
   4. Length of penetration into substrate deck, wall, or nailer shall be sufficient to prevent backing out by vibration, shrinkage, or swelling action. Contractor to establish layout of fasteners, to insure proper attachment through the top flange of the steel deck prior to adhering membrane. Any fasteners through the ribs of decking will not be considered acceptable placement.

2.3 INSULATION MATERIALS

A. Manufacturers:
   1. Refer to manufacturer's "Total System" warranty requirement.

B. Insulation: FS HHI197212/2 Class 1 Polyisocyanurate with glass fiber felt facers. Provide minimum 1 layer, 1/2 inch minimum thickness, square edges, minimum R total = 2.5 aged value or tapered insulation as noted. Use largest acceptable sheets.

2.4 ACCESSORIES

A. Flexible Flashings: Same material as membrane; white color; as recommended by manufacturer.

B. Hard rubber edging with extension to cover roof edge blocking.

C. Termination bars, water cut-off mastic and fasteners.

D. Reinforced EPDM (Reinforced Universal Securement Strip): .060 thick EPDM, reinforced.

E. ½” Protection Board.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work; deck is clean and

smooth, free of snow or ice; properly sloped to drains.

B. Verify roof openings, curbs, and protrusions through roof are solidly set; cant strips and reglets are in place.

C. Notify Architect 48 hours prior to application of insulation and roofing membrane.

D. Notify Architect immediately of any deficiencies in the deck, parapets, or any substrates.

3.2 INSULATION APPLICATION

A. Place insulation with long sides of boards parallel with deck so that side joints between boards do not exceed 1/4. Mechanically fasten insulation to deck to meet FM I -90, Zone II requirements.

B. Minimum Total Insulation Thickness: 1/2 inch or as required to achieve an overall insulation R value of 2.5.

C. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

D. All gaps greater than 1/4" shall be filled with acceptance insulation. Under no circumstances shall the membrane be left unsupported over a space greater than 1/4". Tapered or feathered insulation shall be installed around all roof drains so as to provide proper slope for drainage.

3.3 MEMBRANE APPLICATION

A. Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions with spray and/or roller.

B. Mechanically attach membrane to roof assembly at perimeter according to FM and manufacturer's requirements.

C. Apply adhesive at a rate of according to manufacturer's recommendations, evenly and continuously. Allow adhesive to dry to consistency prescribed by manufacturer before adhering membrane.

D. Roll out membrane and allow the membrane to relax for a minimum of 30 minutes before attachment. Bond sheet to substrate except those areas directly over or within 3 inches of a working crack or expansion joint. Work out air bubbles, wrinkles, and fishmouths. Firmly press sheet into place without stretching.

E. Install perimeter mechanical fasteners in accordance with manufacturers' instructions.

F. Shingle joints on sloped substrate in direction of drainage. Clean both mating surfaces at splice area with seam cleaner, apply adhesive to both surfaces, lap adjoining sheets a minimum of 4" and seal with a roller. Apply in-seam sealant and RUSS strips as delineated. Apply lap sealant to all seams.

G. Continue membrane up vertical surfaces minimum 8 or as noted. Reinforce membrane

with multiple thickness of membrane material over joints.

H. Seal items penetrating membrane with counterflashing membrane material. Install membrane flashings. Seal watertight to membrane.

3.4 FLASHINGS AND ACCESSORIES

A. All EPDM flashings to be a minimum of 0.60 inch thick material as recommended by manufacturer.

B. Apply flexible flashings to seal membrane to vertical elements. Strip in with a minimum of 6" wide EPDM flashing material.

C. Coordinate installation of roof drains, sumps and related flashings.

D. Seal flashings and flanges of items penetrating membrane.

END OF SECTION

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SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Counterflashings over base flashings.

1.2 RELATED SECTIONS
A. Section 07 53 23 - Elastomeric EPDM Sheet Roofing, Fully Adhered: Roofing system.
B. Section 07 71 23 - Gutters and Downspouts.

1.3 REFERENCES
A. ASTM B209 - Aluminum and Alloy Sheet and Plate.
B. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
C. ASTM D4586 - Asphalt Roof Cement, Asbestos-Free.
D. NRCA (National Roofing Contractors Association) - Roofing Manual.
E. SMACNA - Architectural Sheet Metal Manual.

1.4 SUBMITTALS
A. Submit under provisions of Section 01 33 00.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
C. Samples: Submit two samples, 12 x 12 inch in size illustrating typical standing seam, seam, external corner, internal corner, junction to vertical dissimilar surface, material and finish.
D. Submit two samples 12 x 12 inch in size illustrating metal finish color.

1.5 QUALITY ASSURANCE
A. Perform work in accordance with SMACNA standard details and requirements.
B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS
A. Fabricator and Installer: Company specializing in sheet metal flashing work with 5 years documented experience.

1.7 PRE-INSTALLATION CONFERENCE
A. Convene one week prior to commencing work of this section, under provisions of Section 01 31 00.

1.8 DELIVERY, STORAGE, AND HANDLING
A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
C. Prevent contact with materials, which may cause discoloration or staining.

1.9 COORDINATION
A. Coordinate work under provisions of Section 01 31 00.
B. Coordinate with the work of Section 07 65 26 for installing flashing reglets.

PART 2 – PRODUCTS

2.1 SHEET MATERIALS

A. Aluminum Sheet: ASTM B209, .032 inch thick; mill finish, shop pre-coated with baked on enamel coating of color to be selected.

2.2 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
B. Underlayment: ASTM D226 No. 15 asphalt saturated roofing felt.
C. Slip Sheet: Rosin sized building paper.
D. Primer: Zinc chromate type.
E. Protective Backing Paint: Zinc chromate alkyd.
F. Sealant: Specified in Section 07 92 00.
G. Bedding Compound: Rubber-asphalt.
H. Plastic Cement: ASTM D4586, Type I.
I. Reglets: Surface mounted and Recessed type, galvanized steel.
J. Insulating tape: 1/8 inch thick bituminous self adhesive for use between dissimilar metals.

2.3 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Fabricate cleats of type sheet metal, same material as sheet, minimum 2 inches wide, interlockable with sheet.
C. Form pieces in longest possible lengths.
D. Hem exposed edges on underside 1/2-inch miter and seam corners.
E. Form material with standing seams.
F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
G. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
H. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.
B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.
B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

3.3 INSTALLATION

A. Conform to drawing details on the drawings and in the SMACNA manual.
B. Insert flashings into reglets to form tight fit. Secure in place with wedges. Pack remaining spaces with lead wool. Seal flashings into reglets with sealant.
C. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

D. Apply plastic cement compound between metal flashings and felt flashings.

E. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
F. Seal metal joints watertight.
G. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
H. Provide insulating tape where necessary to prevent contact of dissimilar metals.

3.4 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 40 00.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULE

A. Brake metal fascia and trim: Pre-coated Aluminum. Color: To be selected. Profiles as shown on the Drawings.
B. Flashing in contact with masonry: Copper.
C. Parapet coping flashing - Copper. Color: To be selected. Profiles as shown on the Drawings.

END OF SECTION

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ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Roof-edge specialties.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product
B. Shop Drawings: For roof specialties.
   1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
C. Samples: For each type of roof specialty and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS
A. Product Test Reports: For tests performed by a qualified testing agency.
B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS
A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE
A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are SPRI ES-1 tested to specified design pressure.

1.6 WARRANTY
A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 53 23 Elastomeric EPDM Sheet Roofing, Fully Adhered.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. FM Approvals' Listing: Manufacture and install copings and roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.
B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
   1. Design Pressure: 20 PSF.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements.

2.2 ROOF-EDGE SPECIALTIES

A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure single-ply roof membrane. Provide matching corner units.
   1. Manufacturers:
      a. PAC-CLAD Peterson Aluminum; 1005 Tonne Road, Oak Grove, IL 60007; Tel: (800) PAC-CLAD; Fax: (800) 722-7150; web: www.pac-clad.com
      b. Atas International Inc; 6612 Snowdrift Road, Allentown, PA 18106; Tel: (800) 468-1441; Fax: (610) 395-9342; web: www.atas.com
      c. Perimeter Systems a division of SAF; 8370 Highway 78, Villa Rica, GA 30180; Tel; (800) 334-9823; Fax: (770) 942-4173; web: www.saf.com/perimeter-systems.
   2. Formed Aluminum Sheet Fascia Covers: Aluminum sheet, thickness as required to meet performance requirements.
      a. Surface: Smooth, flat finish.
      b. Finish: Two-coat, high-performance, 70 percent polyvinylidene fluoride (PVDF) coating.
      c. Color: As selected by Architect from manufacturer's full range.
   3. Corners: Factory mitered and mechanically clinched and sealed watertight.
   4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
   5. Receiver: Manufacturer's standard material and thickness.
   6. Fascia Accessories: Fascia extenders with continuous hold-down cleats.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Revise "Elastomeric Sealant" Paragraph below if sealant of specific type, grade, class, and use is required.

B. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
   1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.

2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.2 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.3 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder and sealants.

B. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION

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GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Pre-coated Aluminum gutters and downspouts.
B. Prefabricated Scuppers & Through-wall Scuppers

1.2 RELATED SECTIONS
A. Section 07 53 23 – Elastomeric EPDM Sheet Roofing, Fully Adhered.
B. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES
A. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate.
B. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.
C. SMACNA - Architectural Sheet Metal Manual.

1.4 SUBMITTALS
A. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
B. Submit shop drawings & Product data under provisions of Section 01 33 00.
C. Indicate on shop drawings, general construction, configurations, jointing methods and locations, fastening methods, locations and installation details.
D. Provide product data on prefabricated components.
E. Submit Samples under the provisions of Section 01 33 00.
F. Submit three samples 12 inches in length illustrating component design, finish, color and configuration.

1.5 QUALITY ASSURANCE
A. Conform to SMACNA Manual Drawings for nominal sizing of components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to site under provisions of Section 01 60 00.
B. Store and protect products under provisions of Section 01 60 00.
C. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to aid ventilation. Slope to drain.
D. Prevent contact with materials during storage, which may cause discoloration, staining, or damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Architectural Metals; 8188 S. State Road, M-66, Portland, MI 48875; Tel: 616.374.0161; Fax: 616.374.0785; web: www.archmetalsinc.com
B. Englert Inc.; 1200 Amboy Avenue, Perth Amboy, NJ 08861; Tel: 800.364.5378; Fax: 888.389.0520; Web: www.englertinc.com

C. Berger Building Products; 805 Pennsylvania Boulevard, Feasterville, PA 19053; Tel: 215.355.1200; Fax: 215.355.7738; www.bergerbp.com

D. Alcoa Building Products (Aluminum Coil Stock), 201 Isabella Street, Pittsburgh, PA 15212-5858; Tel: 412.553.4545; Fax: 412.553.4498
E. Jay R. Smith Mfg. Co., 2781 Gunter Park DR E, Montgomery, AL 36109; Tel: 334.277.8520; www.jrsmith.com
F. Substitutions: Under provisions of Section 01 60 00.

2.2 MATERIALS

A. Aluminum Sheet: ASTM B209, 3003 Aluminum alloys, 0.032-inch-thick; shop precoated with 3 coats of paint coating, color as selected by architect.

2.3 COMPONENTS

A. Gutter: 6” Box Gutter
B. Downspouts: Square pipe

2.4 ACCESSORIES

A. Elbow: Corrugated
B. Gooseneck Pipe: Profiled to match downspout
C. Anchorage Devices: Type recommended by fabricator.
D. Gutter Supports: Brackets/ hanger to match Gutter material & finish
E. Downspout Supports: Pipe Straps to match Downspout material & finish
F. Mitres & End Caps: Profiled to suit gutter & downspout
G. Joint Fasteners: Profiled to suit gutter & downspout
H. Downspout Strainers: Profiled to suit downspout
I. Gutter Screens: Profiled to suit gutter
J. Downspout Header/ Collector Head:

2.5 FABRICATION

A. Form gutters and downspouts of profiles and sizes indicated.
B. Field measure site conditions prior to fabricating work.
C. Fabricate with required connection pieces.
D. Form sections square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
E. Hem exposed edges of metal.

2.6 FINISHES

A. Backpaint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.
B. Baked Enamel Finish: AA-C12C42R1x (cleaned with inhibited chemicals, conversion coated with an acid-chromate-flourise-phosphase treatment, and painted with organic coating specified below). Apply baked enamel finish in strict compliance with paint manufacturer’s specification for cleaning, conversion coating and paint.
    1. Organic Coating: Manufacturer’s standard thermosetting acrylic enamel, minimum 0.8 mil dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work & conditions are as indicated on shop drawings.
B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Install conductor heads, gutters, downspouts, and accessories in accordance with manufacturer's instructions.
B. Join lengths with formed seams sealed watertight. Flash & seal gutters to downspouts & accessories.
C. Apply backing paint to metal back surfaces.
D. Apply bituminous protective backing on surfaces in contact with dissimilar materials.
E. Slope gutters 1/16 inch per foot minimum.
F. Seal metal joints watertight.
G. Connect downspouts to storm sewer system. Seal connection watertight.

END OF SECTION

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JOINT SEALERS

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Preparing sealant substrate surfaces.
B. Sealant and backing

1.2 RELATED SECTIONS
A. Section 04 01 20 – Unit Masonry.
B. Section 07 25 00 – Fluid-Applied Air Barrier
C. Section 07 50 00 – Elastomeric EPDM Sheet Roofing.
D. Section 07 62 00 – Sheet Metal Flashing & Trim.
E. Section 08 11 13 – Hollow Metal Doors & Frames.
F. Section 08 52 00 - Wood Windows.

1.3 REFERENCES
A. ANSI/ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
B. ANSI/ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
C. ASTM C790 - Use of Latex Sealing Compounds.
D. ASTM C804 - Use of Solvent-Release Type Sealants.
E. ASTM C834 - Latex Sealing Compounds.
F. FS TT-C-00598 - Calking Compound, Oil and Resin Base Type.
G. FS TT-S-001657 - Sealing Compound, Single Component, Butyl Rubber Based, solvent Release Type.
H. FS TT-S-00227 - Sealing Compound: Elastomeric Type, Multi-Component.
I. FS TT-S-00230 - Sealing Compound: Elastomeric Type, Single Component.
J. FS TT-S-001543 - Sealing Compound, Silicone Rubber Base.
K. SWI (Sealing and Waterproofers Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS
A. Submit product data under provisions of Section 01 33 00.

B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations and color availability.

C. Submit samples under provisions of Section 01 33 00.

D. Submit two samples 1/4 x 4 inches in size illustrating colors selected.

E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

F. Submit manufacturer's certificate under provisions of Section 01 40 00 that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE
A. Manufacturer: Company specializing in manufacturing the products specified in this

Section with minimum three years documented experience.

B. Applicator: Company specializing in applying the work of this Section with minimum three years documented experience, approved by sealant manufacturer.

C. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces.

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

1.7 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Section 01 31 00.

B. Coordinate the work of this Section with all Sections referencing this Section.

1.8 WARRANTY

A. Provide five-year warranty under provisions of Section 01 77 00.

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

PART 2 – PRODUCTS

2.1 SEALANTS

A. Acrylic Emulsion Latex: ASTM C834-76, single component; as selected; AC-20 manufactured by Pecora.

B. Butyl Sealant: FS TT-S-001657, black color; BC-158 manufactured by Pecora.

C. Polysulphide Sealant: FS TT-S-230C, Type II - non-sag, Class A; as selected; Synthacalk GC-9 manufactured by Pecora.

D. Polyurethane Sealant: FS TT-S-230C, Type I - self-levelling, Class A; as selected; manufactured by Pecora.

E. Silicone Sealant: FS TT-S-01543B, Class A, low modulus type; as selected; #864 manufactured by Pecora.

2.2 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: ANSI/ASTM D1056 and D1565; Denverfoam or Greenrod oversized 30 to 50 percent larger than joint width; as recommended by Pecora.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.

B. Beginning of installation means installer accepts existing surfaces.

3.2 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Remove loose materials and foreign matter, which might impair adhesion of sealant.

C. Verify that joint backing and release tapes are compatible with sealant.

D. Perform preparation in accordance with ASTM C804 for solvent release and C790 for latex base sealants.

E. Protect elements surrounding the work of this Section from damage or disfiguration.

3.3 INSTALLATION

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

B. Measure joint dimensions and size materials to achieve required width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.

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

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

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

G. Tool joints channel shaped.

3.4 CLEANING AND REPAIRING

A. Clean work under provisions of Section 01 77 00.

B. Clean adjacent soiled surfaces.

C. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01 50 00.

B. Protect sealants until cured.

3.6 SCHEDULE

Location		Type	Color
A.	Brick	E.	Color to match new mortar
B.	Concrete Block	E.	Gray
C.	Dampproofing	C.	Black
D.	Vapor & air barriers	A.	White or clear
E.	Roofing	B.	Black
F.	Flashing & sheet metal	B.	Clear
G.	Steel doors	E.	Black
H.	Windows	E.	Color to match windows

END OF SECTION

HOLLOW METAL DOORS AND FRAMES

PART 1 – GENERAL

1.1 RELATED SECTIONS

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

1.2 SUMMARY

A. Section Includes:
   1. Standard and custom hollow metal doors and frames.
   2. Fire Rated Steel frames.

B. Related Sections:
   1. Section 04 22 00 – Concrete Wall Unit Masonry for embedding anchors for hollow metal work into masonry construction.
   2. Section 08 71 00 - Door Hardware.
   3. Section 09 91 00 – Painting: Field painting hollow metal doors and frames

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
   2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
   3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
   4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
   5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
   6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
   7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
   9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
   10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
   11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
   12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
   13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
   14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.

15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of anchorages, joints, field splices, and connections.
   6. Details of accessories.
   7. Details of moldings, removable stops, and glazing.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40” above sill) or UL 10C.
   1. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack

welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
   1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. CECO Door Products.
   2. Curries Company.
   3. Steelcraft.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical

performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
   a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Manufacturers Basis of Design:
   1. CECO Door Products Polyurethane Core: Imperial Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
   1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
   2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
   3. Manufacturers Basis of Design:
      a. CECO Door Products – SQSeries.

C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
   1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
   2. Frames: Minimum 16 gauge(0.053-inch - 1.3-mm) thick steel sheet.
   3. Manufacturers Basis of Design:
      a. CECO Door Products SQ Series.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size,

formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.7 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:
   1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.

D. Hollow Metal Frames:
   1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
   2. Welded Frames: Weld joints continuously through full throat width of frames, including rabbets, soffits, and stops; grind, fill, dress, and make smooth, flush, and invisible.
      a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
   3. Equal Rabbet Frames: Provide frames with equal rabbet dimensions unless glazing and removable stops require wider dimensions on glass side of frame.
   4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
   5. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
   6. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all

hinges and strike preps regardless of grouting requirements.

7. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
8. Jamb Anchors: Provide number and spacing of anchors as follows:
   a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      I. Two anchors per jamb up to 60 inches high.
      II. Three anchors per jamb from 60 to 90 inches high.
      III. Four anchors per jamb from 90 to 120 inches high.
      IV. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
9. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
   4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 Sections.

2.8 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
   1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
   1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
   3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
   4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:
      a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
      b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
      c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
      d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
   2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise

unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

ALUMINUM-FRAMED ENTRANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes Kawneer Thermally Broken Aluminum Entrances, glass and glazing, and door hardware and components.
   1. Types of Kawneer Thermally Broken Aluminum Entrances include:
      a. AA™425 Thermal Entrance; Wide stile, 4-1/4" (108 mm) vertical face dimension, 2-1/4" (57 mm) depth, high traffic applications.

B. Related Sections:
   1. 07 27 00 - Air Barriers
   2. 07 92 00 - Joint Sealants
   3. 08 71 00 – Door Hardware
   4. 08 80 00 - Glazing

1.3 DEFINITIONS

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed entrance doors shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

B. Aluminum-Framed Entrance Performance Requirements:
   1. Wind loads: Provide entrance system; include anchorage, capable of withstanding wind load design pressures to meet the requirements of the 2018 Connecticut State Building Code.

   2. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 1.57 psf (75 Pa) for pairs of doors. A single 3'0" x 7'0" (915 mm x 2134 mm) entrance door and frame shall not exceed 1.0 cfm/ft^2. A pair of 6'0" x 7'0" (1830 mm x 2134 mm) entrance doors and frame shall not exceed 1.0 cfm per square foot.
   3. Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no

deflection in excess of L/175 for typical application or L/180 for Small-Missile and Large-Missile impact, of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

4. Forced Entry: Tested in accordance with AAMA 1304.
5. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
   a. Insulated Glass – 0.43 (low-e).
6. Solar Heat Gain Coefficient: Glazed thermally broken aluminum door and frame shall have a solar heat gain coefficient of no greater than 0.32 as determined according to NFRC 200.
7. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
   a. Insulated Glass – 57_{frame} and 71_{glass} (low-e).
8. Condensation Resistance (I): When tested to CSA A440, the condensation resistance factor shall not be less than:
   a. Insulated Glass – 48_{frame} and 69_{glass} (low-e).
9. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested in accordance with ASTM E 90, the STC and OITC ratings shall not be less than:
   a. 32 (STC) and 28 (OITC).

1.5 SUBMITTALS

A. Product Data: Include construction details, material descriptions, and fabrication methods, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed entrance door indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.

C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.

D. Samples for Verification: For aluminum-framed door and components required.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed entrance doors.

F. Fabrication Sample: Corner sample consisting of a door stile and rail, of full-size components and showing details of the following:
   1. Joinery, including welds.
   2. Glazing.

G. Other Action Submittals:
   1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures

and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.6 QUAILITY ASSURANCE

A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating thermally broken aluminum-framed entrance doors and storefronts that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports and calculations.

C. Source Limitations: Obtain thermally broken aluminum-framed door through one source from a single manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed glass entrance doors and are based on the specific system indicated. Refer to Division 01 Section “Product Requirements”. Do not modify size and dimensional requirements.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of thermally broken aluminum-framed door openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.

1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product:

1. Kawneer Company Inc.
2. The door stile and rail face dimensions of the AA™425 Thermal Entrance will be as follows:

Door	Vertical Stile	Top Rail	Bottom Rail	Optional Bottom Rail
AA 425 Thermal Entrance	4-1/4”(108mm)	4-1/4”(108mm)	6-1/2”(166mm)	10”(254mm)

3. Major portions of the door members to be 0.125" (4) nominal in thickness and glazing molding to be 0.05" (1.3 mm) thick
4. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
5. Provide adjustable glass jacks to help center the glass in the door opening.

B. Substitutions: Refer to Substitutions Section for procedures and submission requirements
1. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
2. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid installation and construction delays.
3. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
4. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for aluminum entrance and storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum entrances and storefronts for a period of not less than ten (10) years. (Company Name)
5. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
6. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

C. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by aluminum-framed door manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" wall thickness at any location for the main frame and door leaf members.

B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum-framed door members, trim hardware, anchors, and other components.

C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Slide-In-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.

1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

2.3 STOREFRONT FRAMING SYSTEM

A. Storefront Entrance Framing:

1. Trifab™ 451UT
2. Thermally Broken entrance Framing - Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
   a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

B. Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.

D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 GLAZING

A. Glazing: As specified in Division 08 Section “Glazing”.

B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.5 HARDWARE

A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum-framed entrance doors.
B. Standard Hardware:
    1. Weather-stripping:
        a. Meeting stiles on pairs of doors shall be equipped with two lines of weather-stripping utilizing wool pile with polymeric fin.
        b. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing and a wool pile with polymeric fin.
    2. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners.
    3. Threshold: Extruded aluminum, thermally broken, with ribbed surface.
    4. Butt Hinge: Kawneer Standard Stainless Steel w/ Powder Coating & Non Removable Pin.
    5. Push/Pull, Exit Device & Closer: Kawner Standard.
    6. Security Lock/Dead Lock: To match Town standard.

2.6 FABRICATION

A. Fabricate thermally broken aluminum-framed entrance doors in sizes indicated. Include a complete system for assembling components and anchoring doors.
B. Fabricate thermally broken aluminum-framed doors that are reglazable without dismantling perimeter framing.
    1. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1" (24 mm) long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.
    2. Accurately fit and secure joints and corners. Make joints hairline in appearance.
    3. Prepare components with internal reinforcement for door hardware.
    4. Arrange fasteners and attachments to conceal from view.
C. Weather-stripping: Provide weather-stripping locked into extruded grooves in door panels or frames as indicated on manufactures drawings and details.

2.7 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
B. Factory Finishing:
    1. Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating, Color selected from Manufacturers standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated installation.
   1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
   2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
   3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing thermally broken aluminum-framed entrance doors, hardware, accessories, and other components.
B. Install thermally broken aluminum-framed entrance doors level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
C. Set sill threshold in bed of sealant, as indicated, for weather tight construction.
D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUAILITY CONTROL

A. Manufacturer's Field Services: Upon Owner’s written request, provide periodic site visit by manufacturer’s field service representative.

3.4 ADJUSTING, CLEANING & PROTECTION

A. Clean aluminum surfaces immediately after installing aluminum-framed door and storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

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WOOD WINDOWS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Wood Windows:
   1. Clad Ultimate Double-hung windows complete with hardware, glazing, weather strip, insect screen, simulated divided lite and standard or specified anchors, trim and attachments.
   2. New windows to match existing windows that were replaced in a previous façade improvement project in 2016.

1.2 RELATED SECTIONS

A. All applicable provisions of Division 1 shall ply to all work under this section.

B. Section 07 92 00 – Joint Sealers

1.3 REFERENCES

A. American Society for Testing Materials (ASTM):
   1. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
   2. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
   3. ASTM E547 – Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differentiation.
   4. ASTM E2190 – Specification for Sealed Insulating Glass Units.
   5. ASTM EC1036 – Standard Specification for Flat Glass.

B. American Architectural Manufacturer's Association/Window and Door Manufacturer's Association (AAMA/WDMA/CSA):
   1. AAMA/WDMA/CSA 101/I.S.2/A440-08, North American Fenestration Standard Specification for window, doors and skylights.
   2. AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS 2011 - North American Fenestration Standard Specification for window, doors and skylights.

C. WDMA I.S.4: Industry Standard for Water Repellent Preservative Treatment for Millwork.

D. Window and Door Manufacturer's Association (WDMA): 101/Is.2 WDMA Hallmark Certification Program.

E. Sealed Insulation Glass Manufacturer's Association/Insulating Glass Certification Council (SIGMA/IGCC).

F. American Architectural Manufacturer's Association (AAMA): 2605 – Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.

G. National Fenestration rating Council (NFRC):
   1. 101: Procedure for Determining Fenestration Product Thermal Properties.
   2. 200: Procedure for Determining Solar Heat Grain Coefficients at Normal Incidence.

H. Window Covering Manufacturer's Association
   1. A100.1: Standard for safety of corded covering products.

1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings under provision of Section 01 33 23.

B. Product Data: Submit catalog data under provision of Section 01 33 23.

C. Samples:
   1. Submit corner section under provision of Section 01 33 23
   2. Include glazing system, quality of construction and specified finish

D. Quality Control Submittals: Certificates: submit manufacturer's certification indicating compliance with specified performance and design requirement under provision of Section 01 33 23.

1.5 QUALITY ASSURANCE

A. Requirements: consult local code for IBC (International Building Code) adoption year and pertinent revisions for information on:
   1. Egress, emergency escape and rescue requirements
   2. Basement window requirements
   3. Windows fall prevention and/or window opening control device requirements

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver in original packaging and protect from weather.

B. Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation.

B. Store window units in an upright position in a clean and dry storage area above ground to protect from weather under provision of Section 01 66 00.

1.7 WARRANTY

A. Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of purchase.

B. Factory applied interior finish is warranted to be free from finish defects for a period of five (5) years from the original date of purchase.

C. Hardware and other non-glass components are warranted to be free from manufacturing

defects for ten (10) years from the original date of purchase.

D. Contractor agrees that all manufacturer's guaranties/warranties applying to products supplied and/or by installed by the Contractor are extended to the Owner. The Contractor guaranties to perform all repairs due to material failures or faulty workmanship which occur with one (1) year of acceptance of completion of the work by the Owner.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Description: Ultimate Double Hung G2 as manufactured by Marvin, Warroad, Minnesota. www.marvin.com

2.2 FRAME DESCRIPTION

A. Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer.
   1. Kiln-dried to moisture content no greater than 12 percent at the time of fabrication
   2. Water repellant, preservative treated in accordance with ANSI/WDMA I.S.4.

B. Frame exterior aluminum clad with 0.050" (1.3 mm) thick extruded aluminum.

C. Frame thickness: 11/16" (17mm) head and side jambs

D. Frame depth: Frame depth had an overall 5 21/32" jamb (144mm). 4 9/16" (116mm) jamb depth from the nailing fin plane to the interior face of the frame for new construction.

E. Frame bevel: 8-degree bevel on sill and subsill

F. Sill assembly including the sill liner: 2 7/32" (56mm)

2.2 SASH DESCRIPTION

A. Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer
   1. Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication.
   2. Water repellant preservative treated with accordance with WDMA I.S.4.

B. Sash exterior aluminum clad with 0.050" (1.3 mm) thick extruded aluminum.

C. Sash thickness: 1 3/4" (44mm) for operable units

D. Operable sash tilt to interior for cleaning or removal

E. Sash Options: Unequal Sash

F. Interior Sash Sticking
   1. Standard: Ogee
   2. Optional: Interior Square sticking

2.3 GLAZING

A. Select quality complying with ASTM C1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E2190.

B. Glazing method: Insulating glass

C. Glazing seal: Silicone glazed

D. Glass Type: Clear, Low E with Argon

2.4 FINISH

A. Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements'
   1. Aluminum clad colors to match existing.

B. Interior Finish options:
   1. Prime: Factory-applied enamel primer. Available on Pine product only.
   2. Factory-applied water-borne acrylic enamel clear coat. Applied in two separate coats with light sanding between coats.
   3. Factory-applied water-borne acrylic enamel clear coat. Applied in two separate coats with light sanding between coats.

2.5 HARDWARE

A. Balance System: Coil spring block and tackle with nylon cord and fiber filled nylon clutch

B. Jamb Carrier: Vinyl extrusion with wood inserts
   1. Color: beige

C. Lock: High pressure zinc die-cast cam lock and keeper
   1. Finish: Phosphate coated and electrostatically painted color to match existing.

D. Check rail guide

2.6 WEATHER STRIP

A. Operating Units
   1. Jambs: Foam-filled bulb
   2. Header: Continuous dual leaf
   3. Bottom rail and check rail: Hollow bulb

2.7 INSECT SCREEN

A. Factory-installed full or half screen. Half screen covers sash opening.
   1. Screen Mesh: Charcoal Fiberglass

B. Aluminum frame finish:
   1. Color: Matches exterior aluminum clad color

2.8 SIMULATED DIVIDED LIGHTS (SDL)

A. Divided lite width to match existing windows with internal spacer bar.

B. Exterior muntins: 0.050” (1.3mm) thick extruded aluminum

C. Interior muntins: Pine

D. Muntins adhere to glass with closed-cell copolymer acrylic foam tape

E. Exterior sticking: Putty

F. Interior Sticking:
   1. Standard: Ogee
   2. Optional: Square

G. Patterns: Rectangular

H. Finish – exterior matches exterior aluminum clad colors, interior matches interior wood species and color

2.9 ACCESSORIES AND TRIM

A. Installation Accessories:
   1. Factory-installed vinyl nailing/drip cap
   2. Installation brackets: 6 3/8” (162mm), 9 3/8” (283mm), 15 3/8” (390mm)
   3. Masonry brackets: 6” (152mm), 10” (254mm)

B. Aluminum Extrusions:
   1. Casing Profile: Profile to match existing from standard profiles: Brick Mould Casing (BMC), Flat Casing, Columbus Casing, Grayson Casing, Ridgeland Casing, Stratton Casing, Thorton Casing, Potter Casing
   2. Aluminum clad Extrusion: Frame Expander, Jamb Extender, Mullion Cover, Mullion Expander, Subsill, Subsill End Cap and Lineal Cap
   3. Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements. Finish to match exterior frame finish.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions as required in Section 01 71 00. Report frame defects or unsuitable conditions to the General contractor before proceeding.

B. Acceptance of Condition: Beginning on installation confirms acceptance of existing conditions.

3.2 INSTALLATION

A. Assemble and install window/door unit(s) according to manufacturer’s instruction and reviewed shop drawing.

B. Install sealant and related backing materials at perimeter of unit or assembly in accordance with Section 07 92 00 Joint Sealants.

C. Install accessory items as required.

D. Use finish nails to apply wood trim and mouldings.

3.3 FIELD QUAILITY CONTROL

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm^2 (~0.45 cfm/ft^2).

C. Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using "Procedure B" – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied.

3.4 CLEANING

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Leave windows and glass in a clean condition.

3.5 PROTECTING INSTALLED CONSTRUCTION

A. Comply with Section 07 76 00.

B. Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage.

END OF SECTION

GLAZING

PART 1 - GENERAL

1.1 WORK INCLUDED
A. Aluminum-Framed Entrances

1.2 RELATED WORK
A. Section 08 41 13 – Aluminum-Framed Entrances & Store Fronts: Glass

1.3 REFERENCES
A. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
B. ASTM C669 - Glazing Compounds for Back Bedding and Face Glazing of Metal Sash.
C. ASTM C804 Use of Solvent Release Type Sealants.
D. ASTM C864 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
E. ASTM C920 -Elastomeric Joint Sealants.
F. ASTM C1036 - Flat Glass.
G. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
H. ASTM C1172 - Laminated Architectural Safety Glass.
I. ASTM E84- Surface Burning Characteristics of Building Materials.
J. ASTM E283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
K. ASTM E330 Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
L. ASTM E546 - Test Method for Frost Point of Sealed Insulating Glass Units.
M. ASTM E576 - Test Method for Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position.
N. ASTM E773 - Test Method for Seal Durability of Sealed Insulating Glass Units.
O. ASTM E774 - Sealed Insulating Glass Units.
P. FGMA Glazing Manual.
Q. FGMA Sealant Manual.
R. Laminators Safety Glass Association - Standards Manual.
S. SIGMA - Sealed Insulated Glass Manufacturers Association.
T. CPSC 16 CFR Part 1201 for Category II materials.

1.4 PERFORMANCE REQUIREMENTS
A. Provide glass and glazing materials for continuity of building enclosure, vapor retarder, and air barrier:
   1. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
   2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as measured in accordance with ASTM E330 & ASTM E283.
C. Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.5 QUALITY ASSURANCE

A. Conform to Flat Glass Marketing Association (FGMA) Glazing Manual for glazing installation methods.

1.6 SUBMITTALS

A. Submit product data under provisions of Section 01 33 00.

1.7 DELIVERY, STORAGE, AND PROTECTION

A. Deliver products to site under provisions of Section 01 60 00.
B. Store and protect products under provisions of Section 01 60 00.

PART 2 - PRODUCTS

2.1 ACCEPTABLE GLASS MANUFACTURERS

A. Pittsburg Plate Glass.
B. Saint-Gobain
C. Pilkington/ Libbey-Owens-Ford
D. Substitutions: Under provisions of Section 01 60 00.

2.2 GLASS MATERIALS

A. Insulated Glass Units at Aluminum Storefronts: Double pane units with aluminum edge seal; outer pane tinted glass with low E coating on no. 2 face, inner pane of clear glass; interpane space purged with dry hermetic air; total thickness of one inch.
B. Laminated Safety Glass: Two-ply laminated glass for safety/ burglary resistance; Insulating glass units with laminated glass lite(s). Two sheets of monolithic glass bonded together with a polyvinyl butyral interlayer by heat and pressure.

2.5 ACCEPTABLE GLAZING COMPOUND MANUFACTURERS

A. Dow Chemical.
B. Substitutions: Under provisions of Section 01 60 00.

2.6 GLAZING COMPOUNDS

A. Silicone Sealant: Single component, capable of water immersion without loss of properties; non-bleeding; non-staining; cured Shore A hardness of 15-25; dark brown color.
B. Verify glazing sealant is compatible with glazing accessories as supplied by door and window manufacturer. Notify Architect if non-silicone compatible accessories are supplied and require a field applied glazing sealant.

2.7 GLAZING ACCESSORIES

A. Supply glazing accessories in accordance with window and door manufacturer's standard shop glazing procedures and as shown on the drawings.
B. Supply field installed glazing accessories in accordance with window and door manufacturer's recommendations.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify wall surfaces are clean, free of obstructions, and ready for work of this Section.

B. Verify sashes are clean, free of obstructions, and ready for work of this Section.
C. Beginning of installation means acceptance of substrate.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.
B. Seal porous glazing channels or recesses.

3.5 EXTERIOR COMBINATION METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and set against permanent stops, 3/16 inch (5 mm) below sightline. Seal corners by butting tape and dabbing with butyl sealant.
B. Apply heel bed of butyl sealant along exterior void ensuring full contact with pane.
C. Place setting blocks at 1/4 points.
D. Rest glass on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane.
E. Install removable stops, spacer strips inserted between glass, and applied stops at 24 inch (600 mm) intervals, 1/4 inch (6 mm) below sightline. Place glazing tape on glass with tape 1/4 inch (6 mm) below sightline.
F. Fill gap between pane and applied stop with sealant to depth equal to bite of frame on pane, but not more than 3/8 inch (9 mm) below sightline.
G. Apply cap bead of sealant along exterior void, to uniform line, flush with sightline. Tool or wipe sealant surface with solvent for smooth appearance.

3.10 SCHEDULE

A. Exterior Storefront, Sidelights, Transoms, Doors: Low E, Insulated, Tempered Glass

3.11 CLEANING

A. Remove labels after work is completed.

END OF SECTION

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RESILIENT STAIR TREADS AND RISERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Resilient Rubber Stair Tread with Riser.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, including printed statement of VOC content.

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.

D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Mockups: Provide resilient products with mockups specified in other Sections.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.6 PROJECT CONDITIONS

A. Install resilient products after other finishing operations, including painting, have been completed.

B. Maintain ambient temperatures within range recommended by Johnsonite, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

C. Maintain the ambient relative humidity between 40% and 60% during installation.

D. Until Substantial Completion, maintain ambient temperatures within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

PART 2 - PRODUCTS

2.1 RESILIENT RUBBER STAIR TREAD WITH RISER

Manufacturer:

Johnsonite, Inc.	Phone	(800) 899-8916
16910 Munn Road		(440) 543-8916
Chagrin Falls, Ohio 44023	Tech:	Ext 9297
Web: www.tarkettna.com	Samples:	Ext 9299
E-mail:	Fax:	(440) 543-8920
info@johnsonite.com		

A. Resilient Rubber Stair Tread: JOHNSONITE RUBBER INTEGRATED STAIR TREAD WITH RISER specify – Rubber Integrated Stair Tread and Riser with the following physical characteristics:
   1. Manufactured from a homogeneous composition of 100% synthetic rubber.
   2. Complies with requirements for ASTM F 2169 Standard Specification for Resilient Stair Treads, Type TS, Class 1 and 2, Group 1 and 2.
   3. Hardness: ASTM D 2240 – Not less than 85 Shore A.
   4. Abrasion Resistance: ASTM D 3389 – less than 1 gram weight loss.
   5. ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish- Coated Flooring of 0.6 or greater.
   6. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm^2 or greater, Class I.
   7. Integrated tread and riser.
   8. Visually Impaired treads meet ADA and are California Title 24 Accessibility requirements.
   9. Visually Impaired treads will have 2" wide co-extruded contrasting color insert or 2" wide contrasting color grit tape insert.

B. Solid Color Rubber Integrated Stair Tread and Riser
   1. For Raised Round surface, solid color integrated stair tread and riser, 2" height hinged Square Nose, tapering .210" to .153", 20" overall width including 13" tread depth with 7" integrated riser, tread length per plans.
      a. Color: selection by Architect
      b. Length (per plans)
      c. 'Round Pattern'

2.2 INSTALLATION MATERIALS

A. Adhesives: as recommended by Johnsonite to meet site conditions.
   1. Johnsonite 965 Flooring and Tread Adhesive
   2. Johnsonite 946 Premium Contact Bond Adhesive
   3. Johnsonite 975 Two-Part Urethane Adhesive
   4. Johnsonite 996 Two-Part Epoxy

B. Stair Tread and Nose Filler: Johnsonite #930 Two-Part Epoxy Caulking Compound to fill nosing substrates that do not conform to tread contours.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
   1. Wood steps/substrates:
      a. The substrate must be rigid, free of movement.
      b. Do not install over OSB (Oriented Strand Board), particle board, chipboard, lauan or composite type underlayments.

B. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement-based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

C. Floor covering shall not be installed over expansion joints.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT STAIR TREAD AND RISER INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Stair Tread and Nosing:
   1. Use Johnsonite #930 Epoxy Caulking Compound to strengthen nosing and fill irregularities in substrates to conform to tread nosing.
   2. Tightly adhere to substrates throughout length of each piece.
   3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION

PAINTING

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Interior and exterior painting, including surface preparation.

1.2 RELATED SECTIONS
A. Section 05 52 00 - Metal Fabrications.
B. Section 06 20 00 - Finish Carpentry.
C. Section 08 11 13 – Hollow Metal Doors and Frames

1.3 REFERENCES
A. Green Seal Standard GS-11; May 20, 1993.
B. US Green Building Council, (USGBC) - Green Seal standards for LEED paint credits.
C. Occupational Safety and Health Act (OSHA) - Safety Standards.
D. American National Standards Institute (ANSI) - Performance Standards.
E. Paint Decorating Contractors of America (PDCA) - Application Standard.
F. National Paint and Coatings Association (NPCA) - Gloss Standard.
G. American Society for Testing Materials (ASTM) - Testing Methods.
H. Ozone Transmission Commission (OTC) - Established levels of Volatile Organic Compounds.
I. SCAQMD 1168 - South Coast Air Quality Management District Rule #1168; October 3, 2003.
J. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.
K. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.
L. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 DEFINITIONS
A. Commercial as used in this Section refers to a product well suited for a commercial application.

B. DFT as used in this Section refers to the Dry Film Thickness of the coating.

C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.

D. DTM as used in this Section refers to paint that is applied Direct To Metal.

E. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet the following OTC limits for VOC's.
1. Interior flat paints: 50 grams per liter or less, per gallon.
2. Interior enamels: 150 grams per liter or less, per gallon.
3. Interior stains: 250 grams per liter or less, per gallon.

4. Interior primers: 200 grams per liter or less, per gallon.
5. Rust preventive coatings: 400 grams per liter or less, per gallon.
6. Dry fog coatings: 400 grams per liter or less, per gallon.
7. Floor coatings: 250 grams per liter or less, per gallon.

F. Premium as used in this Section refers to the best quality product "top of the line".

G. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains. The level of VOCs appears after each product listed in the Schedule in grams per liter (g/L).

H. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85-degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.
1. Flat - Less than 5 Percent.
2. Eggshell - 5 - 20 Percent.
3. Satin - 20 - 35 Percent.
4. Semi-Gloss - 30 - 65 Percent.
5. Gloss - Over 65 Percent.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittals

B. Product Data: Provide a complete list of all products to be used, with the following information for each:
1. Manufacturer's name, product name and/or catalog number, and general product category.
2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.

C. Samples: Submit three paper samples, 5 inches by 7 inches in size, illustrating selected colors for each color and system selected with specified coats cascaded.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years’ experience.

B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Disposal:
   1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
   2. Do not incinerate closed containers.
   3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.

B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.10 EXTRA MATERIALS

A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.

B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Benjamin Moore & Co., which is located at: 101 Paragon Dr; Montvale, NJ 07645; Toll Free Tel: 855-724-6802 ; Email:request info (info@benjaminmoore.com); Web:www.benjaminmoore.com/en-us/for-architects-and-designers|www.benjaminmoore.ca

B. Substitutions:
   1. Sherwin Williams, which is located at: 101 Prospect Ave, Cleveland, OH 44115; Toll Free Tel: 800.474.3794; Web: www.sherwin-williams.com
   2. Pittsburgh Paints Industries, Inc., which is located at: One PPG Place, Pittsburgh, PA 15272; Toll Free Tel: 800.441.9695 ; Web: www.ppgpittsburghpaints.com

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIALS - GENERAL

A. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D-National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.

B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

2.4 INTERIOR PAINT SYSTEMS

A. MASONRY: CMU - Concrete, Split Face, Scored, Smooth, High Density, Low Density, Fluted.
   1. Latex Systems:
      a. Gloss Finish High Performance:
         1) 1st Coat: Benjamin Moore Super Spec Masonry Interior/Exterior Hi-Build Block Filler 206 (45 g/L), MPI # 4, X-Green 4, LEED 2009, LEED V4, CHPS Certified.
         2) 2nd Coat: Benjamin Moore Ultra Spec D.T.M. Acrylic Gloss Enamel HP28 (45 g/L), MPI # 114, X-Green 114, 154, X-Green 154, 164, LEED 2009, LEED V4.
         3) 3rd Coat: Benjamin Moore Ultra Spec D.T.M. Acrylic Gloss Enamel HP28 (45 g/L), MPI # 114, X-Green 114, 154, X-Green 154, 164, LEED 2009, LEED V4.
      b. Semi-Gloss Finish High Performance:
         1) 1st Coat: Benjamin Moore Super Spec Masonry Interior/Exterior Hi-Build Block Filler 206 (45 g/L), MPI # 4, X-Green 4, LEED 2009, LEED V4, CHPS Certified.
         2) 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.

3) 3rd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.

B. METAL - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous and Ornamental Iron, Structural Iron, Ferrous Metal)
1. Latex Systems:
a. Gloss Finish High Performance:
1) 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
2) 2nd Coat: Corotech Acrylic DTM Enamel Gloss V330 (199 g/L), MPI # 154, 164, LEED 2009, LEED V4.
3) 3rd Coat: Corotech Acrylic DTM Enamel Gloss V330 (199 g/L), MPI # 154, 164, LEED 2009, LEED V4.
b. Semi-Gloss Finish:
1) 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
2) 2nd Coat: Corotech Acrylic DTM Enamel Semi-Gloss V331 (204 g/L), MPI # 153.
3) 3rd Coat: Corotech Acrylic DTM Enamel Semi-Gloss V331 (204 g/L), MPI # 153.

2.5 EXTERIOR PAINT SYSTEMS

A. METAL: Misc. Iron, Ornamental Iron, Structural Iron and Steel, Ferrous Metal.
1. Latex Systems:
a. Gloss Finish
1) 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
2) 2nd Coat: Benjamin Moore Ultra Spec EXT Gloss Finish N449 (46 g/L) MPI # 11.
3) 3rd Coat: Benjamin Moore Ultra Spec EXT Gloss Finish N449 (46 g/L) MPI # 11.
b. Semi-Gloss Finish
1) 1st Coat: Corotech Acrylic Metal Primer V110 (199 g/L), LEED Credit.
2) 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.
3) 3rd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED 2009, LEED V4.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.

B. The Contractor shall review product health and safety precautions listed by the manufacturer.

C. The Contractor shall be responsible for enforcing on site health and safety requirements

associated with the Work.

D. Do not begin installation until substrates have been properly prepared.

E. Ensure that surfaces to receive paint are dry immediately prior to application.

F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.
   1. Concrete and Masonry: 3-5 percent. Allow new concrete to cure a minimum of 28 days.
   2. Exterior Wood: 17 percent.
   3. Interior Wood: 15 percent.
   4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
   5. Plaster and Gypsum: 15 percent.
   6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.

G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.

H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.2 PREPARATION - GENERAL

A. Clean surfaces thoroughly prior to coating application.

B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.

C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.

D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.

E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.

F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.

G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.

H. Protect adjacent surfaces not indicated to receive coatings.

I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.3 SURFACE PREPARATION

A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.
B. Existing Coatings:
   1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
   2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.
C. Masonry Surfaces - Restored: Remove loose particles, sand, efflorescence, laitance, cleaning compounds and other substances that could impair coating performance or appearance.
D. Metals - Ferrous, Unprimed: Remove rust or scale, if present, by wire brush cleaning, power tool cleaning, or sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning, with phosphoric-acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.
E. Metals - Ferrous, Shop-Primed: Remove loose primer and rust, if present, by scraping and sanding, feathering edges of cleaned areas to produce uniform flat surface; solvent-clean surfaces and spot-prime bare metal with specified primer, feathering edges to produce uniform flat surface.
F. Wood:
   1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer; fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
   2. Remove mill marks and ink stamped grade marks.
   3. Apply primer coat to back of wood trim and paneling.
G. Wood Doors: Seal door tops and bottoms prior to finishing.
H. Wood Doors - Field-Glazed Frames and Sash: Prime or seal glazing channels prior to glazing.

3.4 APPLICATION - GENERAL

A. Application of primers, paints, stains or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.
B. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each

coat before applying next coat.

D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5 feet (1.5 m).

E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.

F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.

G. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.

H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.5 CLEANING

A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.

B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.

C. Reconnect equipment adjacent to surfaces indicated to receive coatings.

D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.

E. Remove protective materials.

3.6 PROTECTION AND REPAIR

A. Protect completed coating applications from damage by subsequent construction activities.

B. Repair to Architect's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Architect's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

3.7 SCHEDULE - COLORS

A. Final Color Selections will be made by the Architect and Owner at a later date based on samples and product submissions in accordance with section 1.5.

END OF SECTION

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. Reference is made to State of Connecticut Department of Transportation Form 816 and 818, as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated.

1.02 SUMMARY

A. Section includes the following:
1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing site utilities.

B. Related section:
1. Earth Moving
2. Erosion Control

1.03 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.04 MATERIAL OWNERSHIP

A. Contractor shall arrange for and attend a pre-construction conference with the Town of Vernon prior to commencing construction.

B. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.

D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

F. The following practices are prohibited within proximity to trees to be preserved:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Erection of sheds or structures.
   4. Impoundment of water.
   5. Excavation or other digging unless otherwise indicated.
   6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
   1. Obtain approved Satisfactory soil material from off-site sources when satisfactory soil material is not available on-site.

B. Erosion Control Materials: Shall meet all requirements of the CT 2002 Erosion Control Manual.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate, clearly identify, and protect trees, shrubs, and other vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by the Engineer.

3.03 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
   1. Arrange with utility companies to shut off indicated utilities.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Engineer not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Engineer's written permission.

3.04 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
   1. Remove stumps and roots completely within construction areas.

2. Use care to protect trees to be saved.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.05 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water. Circle entire base of stockpile with temporary erosion control measures.

3.06 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

3.07 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work. Recycle materials including concrete, brick, paving blocks, wood bollards, metal light poles, metal signs, wire, and all other similar materials.

C. Stockpile topsoil for use in berms and lawn areas. Surplus topsoil after completion of construction must be removed off-site.

3.08 STORM DRAINAGE

A. Protect existing storm drainage structures to remain from damage during construction.

B. Remove completely existing storm drainage structures to be removed.

C. Protect existing storm drainage pipe to remain from damage during construction.

END OF SECTION

EARTH MOVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. State of Connecticut Department of Transportation Form 816 and 818 as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated.

1.02 SUMMARY

A. Section includes the following:

1. Preparing subgrades for walks, pavements, turf and grasses.
2. Subbase course for concrete walks.
3. Excavating and Subbase course and base course for asphalt paving.
4. Excavating and backfilling for utility trenches.
5. Dewatering

1.03 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 QUALITY ASSURANCE

A. Pre-excavation Conference: A pre-construction meeting shall be held as directed by the Town of Vernon and Engineer.

B. Form 818 – State of Connecticut Department of Transportation "Standard Specifications for Roads, Bridges, and Incidental Construction", 2017 with supplements shall be used for material compliance and execution of the work in this section.

C. Prior to earthwork activities, coordinate with the owner's Testing Agent to assure and schedule all testing as may be required by the owner.

1.05 PROJECT CONDITIONS

A. Utility Locator Service: Notify 'Call Before You Dig' at least 72 hours prior to the construction effort.

B. Do not commence earth moving operations until all appropriate erosion control measures, construction fencing and pedestrian protection measures are in place.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2. Frozen materials are considered Unsatisfactory

D. Subbase Material: Additional material shall meet CT DOT Form 818 M.02.02 Subbase.

E. Processed Aggregate Base Course: Shall meet CT DOT Form 818 M.05.01 Processed Aggregate Base.

F. Bedding Course: Shall meet CT DOT Form 818 M.08.03.01 Bedding Material

G. Gravel Base shall meet CT DOT Form 818 M.02.03

H. Riprap shall meet CT DOT Form 818 M.12.02

I. Crushed Stone: consist of a ¾-inch size durable crushed rock or durable crushed gravel stone and shall conform to the requirements of the CT DOT Form 818, Section M.01.01, No. 6

2.02 ACCESSORIES

A. Warning Tape: Shall meet CT DOT Form 818 section 1.05.15

B. Geotextile fabric should be a non-woven fabric, consisting of Mirafi 140N or an approved equal product.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.02 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials. Remove and legally dispose of unsatisfactory material off-site.

3.03 EXCAVATION FOR EDGES OF TREE AND PLANT PROTECTION ZONES

A. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.04 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.05 EXCAVATION FOR UTILITY TRENCHES

A. Contractor shall obtain and follow the requirements and specifications of the applicable utility providers. Where those requirements differ from those noted herein, the more restrictive shall govern.

B. Excavate trenches to indicated gradients, lines, depths, and elevations.

C. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches (300 mm) each side of pipe or conduit.

D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material, 4 inches (100 mm) deeper elsewhere, to allow for bedding course, or as required by the utility company.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.06 SUBGRADE INSPECTION

A. Proof-roll subgrade below the structure, sidewalks and pavements with a vibratory roller or other equipment approved by the Engineer to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Sub-grades that become unstable (i.e. soft, yielding, rutting, pumping, etc.) under the action of proof-rolling may require selective undercutting or further stabilization prior to placement of the structural fill or base stone.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.07 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavations under all construction, pipe, or conduit as directed by the Engineer.

3.08 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

2. Stockpile topsoil to use within berms and lawn areas. Grade as shown.

3. Legally dispose of all other surplus soil materials off-site.

3.09 UTILITY TRENCH BACKFILL

A. Contractor shall obtain and follow the requirements and specifications of the applicable utility providers. Where those requirements differ from those noted herein, the more restrictive shall govern.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

D. Place and compact initial backfill in accordance with appropriate utility company requirements to a height of 12 inches (300 mm) over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Install warning tape in accordance with CT DOT Form 818 Section 1.05.15 requirements and utility company requirements.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in lifts to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use Granular Fill and conform to CT DOT Form 818 Section M.02.01.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in lifts not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557 (Modified AASHTO Compaction).

1. Under pavements and concrete walks, scarify and recompact top 12 inches of existing subgrade and each lift of backfill or fill soil material at 95 percent of the maximum dry density.

2. Under bituminous walkways and gravel paths, scarify and recompact top 6 inches below subgrade and compact each lift of backfill or fill soil material at 95 percent of the maximum dry density.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each lift of backfill or fill soil material at 85 percent of the maximum dry density.
4. For utility trenches, compact each lift of initial and final backfill soil material at 95 percent of the maximum dry density.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. During construction, positive grading will be maintained to direct storm runoff away from buildings and foundations.
2. Final grading shall be done to insure positive grading to direct storm runoff away from buildings and foundations.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Shape subbase course and base course to required crown elevations and cross-slope grades.
2. Place subbase course and base course that exceeds 6 inches in compacted thickness in lifts of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage qualified personnel to perform tests and inspections. Contractor shall provide a minimum of 72 hours notice of proposed earthwork activities.

B. Allow qualified personnel to inspect and test subgrades and each fill or backfill lift. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. When qualified personnel reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

D. Do not allow debris to collect near doors or building openings during construction. Maintain the site in a clean and neat appearance throughout the construction process.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.18 DEWATERING

A. Work shall include all material, labor, and equipment required for the removal of water from the excavated areas to maintain in a dry condition all excavations and work areas. The Contractor shall be responsible for performing all required dewatering in such a manner as to prevent injury to persons, public health, the environment, or damage to existing facilities.

B. The Contractor shall be responsible for providing, maintaining, operating, and removing all dewatering equipment and other facilities, including all pumping and appurtenant equipment, required to maintain the area in a dry condition during construction.

C. Any damage to existing including settlement caused by dewatering operations, or damage to new work due to failure of the Contractor to maintain a dry work area shall be repaired by the Contractor as directed by the Engineer at no additional cost.

D. The Contractor’s dewatering process shall be performed in such a manner as to limit the quantities of sediment removed.

E. Dewatering shall comply to 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

F. All pipelines or structures not stable against uplift shall be thoroughly braced or otherwise protected against movement or damage.

G. Water being disposed of by the dewatering operation shall be discharged into properly sized sedimentation control basins, or other appropriate structures. In no case shall the water from the dewatering process be allowed to flow directly into a wetland or watercourse.

H. The dewatering process shall be initiated in any excavated area where excess water accumulates preventing the work to be performed in dry conditions.

END OF SECTION

EROSION CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. State of Connecticut Department of Transportation Form 816 and 818 as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated.

1.02 SUMMARY

A. Section includes the following:

1. Temporary erosion and sedimentation control materials and practices.

1.03 QUALITY ASSURANCE

A. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers.

B. Comply with all governing codes and regulations including the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store materials in accordance with manufacturer's written instructions.

1.05 MAINTENANCE SERVICE

A. Maintain temporary erosion control measures until site is stabilized and accepted by local authority having jurisdiction. Maintain temporary erosion control mats on seeded areas until satisfactory turf is established and accepted by Engineer.

PART 2 - PRODUCTS

2.01 EROSION CONTROL MATERIALS

A. Silt Fencing

1. Filter Fabric: Extra strength filter fabric (50 lbs/lin.in. min.), or a combination of standard strength (30 lbs/lin.in. min.) and 14-gauge woven wire fence.
2. Fence posts: 2”x2” pressure treated wood, minimum of 48” high.

B. Haybales: Haybales shall be composed of non-degraded straw in reasonable condition.

C. Wattles shall be chosen from the CT DOT Qualified Product List, or conform to the requirements of ECWATTLES, 9.0in by EastCoast Erosion Control, Sediment Retention Fiber Rolls, 100% Agricultural Straw or approved equivalent.

D. Construction Entrance: 2" stone to meet CT DOT Form 818 M.01.01 No. 3.

E. Filter Fabric: Filter Fabric for catch basin grates shall be chosen from the CT DOT Qualified Product List, Revised August 2017 listed as Geotextile for Erosion Control.

F. 3/8" pea stone: 3/8" Pea stone shall meet CT DOT Form 818 M.01.01 No. 8.

PART 3 - EXECUTION

3.01 GENERAL AND CONSERVATION

A. All structural erosion and sediment control practices shall be placed prior to or as the first step in grading for all areas.

B. Permanent or temporary soil stabilization shall be applied to disturbed areas within 14 days after final grade is reached on any portion of the site.

C. Any disturbed area not stabilized with seeding, sodding, paving, or built upon by November 1st, or areas disturbed after that date, shall be mulched immediately with hay or straw at the rate of 2 tons per acre and over-seeded by April 15th.

D. At the completion of construction, and establishment of vegetation, all temporary sediment controls shall be removed and legally disposed off-site.

3.02 EROSION CONTROL

A. Provide straw bales, silt fencing and wattles in areas shown on the plans, or in other areas deemed as potential erosion locations.

B. Silt fencing and/or Wattles shall be placed down-gradient of construction areas, as necessary, to control sediment and minimize erosion until turf is established.

3.03 SILT FENCING

A. Set posts maximum ten feet (10') apart. Angle posts approximately 5 degrees upslope.

B. Excavate a 6"x6" trench upslope and along the line of posts.

C. Staple wire fencing to upslope side of posts, if applicable.

D. Attach filter fabric to wire fence or upslope side of posts and extend fabric into trench. Top of fabric is to be a minimum of 30" above ground level.

E. Backfill and compact excavated soil.

3.04 WATTLES

A. Follow manufacturer's instructions and plan detail for installation.

3.05 MAINTENANCE

A. All erosion and sediment control measures shall be checked weekly and within 24 hours after each rainfall to assure that the measures are functioning adequately. Sediment that is collected will be distributed on the protected portion of the site and stabilized.

B. All stockpiles of earth and topsoil shall be protected with temporary seeding, erosion control fence around the entire perimeter, or other means to prevent erosion.

3.06 CONSTRUCTION ACCESS

A. Provide a stone construction entrance as shown on the plans and in the detail drawings to help prevent tracking of mud and dirt by vehicles leaving the construction site.

B. Roadside ditches and other drainage structures should be checked regularly to ensure that they do not become clogged with silt or other debris.

C. Roadside ditches and other drainage structures should be checked regularly to ensure that they do not become clogged with silt or other debris.

3.07 SILT FENCE

A. Silt fences and filter barriers shall be inspected immediately after each rainfall, at least daily during prolonged rainfall, and weekly during other periods. Any required repairs shall be made immediately.

B. Should the fabric on a silt fence or fabric barrier decompose or become ineffective and the barrier is still necessary, it shall be replaced immediately.

C. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.

D. For any sediment deposits remaining after the silt fence or filter barrier is no longer required, the sediment shall be spread, dressed, and seeded to conform to the surrounding area.

END OF SECTION

CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. State of Connecticut Department of Transportation Form 816 and 818 as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated.

1.02 SUMMARY

A. Section includes the following:

1. Concrete walks
2. Concrete pads
3. Concrete ramps
4. Detectable Warning Surface
5. Concrete Steps with Handrail

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each exposed product and for each color and texture specified.

C. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.04 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

PART 2 - PRODUCTS

2.01 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

D. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

E. Deformed-Steel Wire: ASTM A 496/A 496M.

F. Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars. Cut bars true to length with ends square and free of burrs.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

2.02 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: Shall meet CT DOT Form 818 M.03.01.

a. Fly Ash: Shall meet CT DOT Form 818 M.03.01 3(c)

B. Normal-Weight Aggregates: Shall meet CT DOT Form 818 M.03.01 1&2.

C. Water: Potable and complying with CT DOT Form 818 M.03.01 4.

D. Air-Entraining Admixture: Shall meet CT DOT Form 818 M.03.01 5.

E. Chemical Admixtures: Shall meet CT DOT Form 818 M.03.01 5.

2.03 CURING MATERIALS

A. Curing Materials: Shall meet CT DOT Form 818 M.03.01 4.

2.04 RELATED MATERIALS

A. Joint Fillers: Shall meet CT DOT Form 818 M.03.02 2.

B. Base material: Shall meet CT DOT Form 818 M.02.

C. Detectable Warning Strip: Shall consist of truncated domes meeting ADAAG guidelines (ADAAG 4.29.2) and be chosen from the CT DOT's Qualified Products list to detect boundary between sidewalk and parking lot or street.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Proof-roll prepared subbase surface below concrete walks, pads, etc. Identify soft pockets and areas of excess yielding.

B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.02 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.03 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.04 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.05 CONCRETE PLACEMENT

A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

B. Comply with CT DOT Form 817 6.01 requirements for measuring, mixing, transporting, placing, and consolidating concrete.

C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

D. Screed paving surface with a straightedge and strike off.

E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.06 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.07 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screening, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete in accordance with CT DOT Form 818 6.01.

3.08 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/2 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/2 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.09 REPAIRS AND PROTECTION

A. Remove and replace concrete sidewalk that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.

B. Protect concrete sidewalks from damage.

C. Maintain concrete sidewalks free of stains, discoloration, dirt, and other foreign material. Sweep sidewalks not more than two days before date scheduled for Substantial Completion inspections.

3.10 CONCRETE STEPS WITH HANDRAIL

A. Concrete steps shall be poured in place according to plan detail. Handrail shall be installed by manufacturer's installation instructions. Reference is made to CT DOT Standard Drawing "Concrete Steps," as necessary.

3.11 DETECTABLE WARNING STRIP

A. Detectable warning strips shall be installed according to the manufacturer's directions.

END OF SECTION

TURF & GRASSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. Reference is made to State of Connecticut Department of Transportation Form 816 and 818, as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated.

1.02 SUMMARY

A. Section includes the following:

1. Seeding for lawn areas.

1.03 DEFINITIONS

A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

I. Surface Soil: Whatever soil is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of grass seed.

C. Product certificates.

1.05 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

1. Pesticide Applicator: State licensed, commercial.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

1.07 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: Until Substantial Completion.

a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

PART 2 - PRODUCTS

2.01 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: State-certified seed of grass species as follows:

1. Proportioned by weight as follows:

a. Bluegrass Blend (3 varietires) 50% of mixture

b. Chewings Red Fescue 30% of mixture

c. Perennial Ryegrass 20% of mixture

2.02 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve, containing a maximum 60% oxide.

B. Aluminum Sulfate: Commercial grade, unadulterated.

C. Perlite: Horticultural perlite, soil amendment grade.

D. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.

E. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

F. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

2.03 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through [1-inch (25-mm)] [3/4-inch (19-mm)] [1/2-inch (12.5-mm)] sieve; soluble salt content of [5 to 10] decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

D. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.04 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.05 PLANTINGS SOILS

A. Planting Soil Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process or ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 2 percent organic material content. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Topsoil by Volume: as recommend by soils analysis.
2. Ratio of Loose Sphagnum Peat to Topsoil by Volume: as recommend by soils analysis.
3. Ratio of Loose Wood Derivatives to Topsoil by Volume: 10%-12%.
4. Weight of Lime per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.
5. Weight of Aluminum Sulfate per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.
6. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.
7. Volume of Sand Plus 10 Percent Diatomaceous Earth per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.
8. Weight of Commercial Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.
9. Weight of Slow-Release Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): as recommend by soils analysis.

2.06 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

2.07 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.08 HYDROSEED

A. Mulch: Mulch shall be composed of cellulose or wood fiber products with no growth or germination inhibiting substances, and shall be manufactured in such a manner that when thoroughly mixed with seed, fertilizer, organic stabilizer, and water, in the proportions specified, will form homogeneous slurry which is capable of being sprayed to form a porous mat. The fibrous mulch in its air-dry state shall contain no more than 15% by weight of water. The fiber shall have a temporary green dye and shall be accompanied by a certificate of compliance stating that the fiber conforms to these specifications.

B. Organic Stabilizer/Tackifier: Shall be an organic substance supplied in powder form and shall be psilium-based and packed in clearly marked bags stating the contents of each package.

C. Equipment: Equipment used for application of slurry shall be a commercial-type Hydro-Seeder and have a built-in agitation system with an operation capacity sufficient to agitate, suspend and homogeneously mix slurry. Tank capacity shall be a minimum of 1,500 gallons and shall be mounted on a truck to allow access to the site. Distribution Lines: Large enough to prevent stoppage and allow for even distribution of slurry over the site. Pump: Shall be able to generate 150 psi at the nozzle.

PART 3 - EXECUTION

3.01 TURF AREA PREPARATION

A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 2 inches (50 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
2. Spread planting soil to a depth of 4 inches (100 mm) but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

B. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 6 inches (150 mm). Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches (100 mm) of soil. Till soil to a homogeneous mixture of fine texture.
3. Remove stones larger than 2 inches (50 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Eliminate potential water-holding pockets. Grade to provide positive drainage away from buildings and structures. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

E. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.02 SEEDING

A. Seeding shall be completed using one of the following methods:

1. Broadcast / Drop Seed

    a. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
    b. Sow seed at a total rate of 4.5 lb/1,000 sq ft.
    c. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.
    d. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre (42 kg/92.9 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment. Prevent straw from blowing on or being applied to adjacent properties or streets.

2. Hydroseeding

    a. Preparation:

        1) Water, mulch, fertilizer, binder and other ingredients shall be added to the tank simultaneously so that the finished load is a homogenous mix of the specified ingredients.
        2) Seed shall be added last and shall be discharged within 2 hours. Loads held over 2 hours will be recharged with ½ the seed rate before application.
        3) Once fully loaded, the complete slurry shall be agitated for 3-5 minutes to allow for uniform mixing.

    b. Apply fertilizer and seed per rates specified herein.
    c. Apply mulch at a rate of 35-40 pounds per 1000 square feet.
    d. All hydroseed applications are to be applied in a sweeping motion to form a uniform application and form a mat at the specified rates.
    e. Unused Loads: If mixture remains in tank for more than 8 hours it shall be removed from the job site at contractor's expense.

3.03 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

B. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain height appropriate for species without cutting more than 1/3 of grass height.

3.04 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Engineer:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.05 PROJECT CLEAN-UP

A. General: All turf areas and staging areas shall be maintained in a neat and orderly condition. Keep paved areas free of soil.

B. Hydro-Seeding Overspray: Installing contractor is responsible for washing or otherwise cleaning excess material off all areas not intended to receive treatment.

C. Debris: Clean up and remove associated materials and debris from project site before Final Acceptance.

END OF SECTION

STORM DRAINAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions and Division 1 Specifications Sections apply to this Section.

B. Reference is made to State of Connecticut Department of Transportation Form 816 and 818, as applicable.

C. Town of Vernon Public Regulations and Specifications Regarding Curbs, Sidewalks & Street Excavations, Revised 2/13/2014 or most recently dated

1.02 SUMMARY

A. Section includes the following:

1. Pipe and fittings.
2. Structures: Catch Basins

1.03 RELATED SECTIONS

A. Section 31 20 00 “Earth Moving" for aggregate subbase and base courses.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Certificates: For each type of pipe, fitting and stormwater structure, from manufacturer.

C. Field quality-control reports.

1.05 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Architect and Construction Manager no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Architect's and Construction Manager's written permission.

PART 2 - PRODUCTS

2.01 HDPE PIPE AND FITTINGS

A. Corrugated Polyethylene Gravity Pipe and Fittings: Shall meet CT DOT Form 818 M.08.01

2.02 CATCH BASINS

A. Standard Precast Concrete Catch Basins: Shall meet CT DOT Form 817 M 08.02.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 312000 “Earth Moving".

3.02 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install catch basins for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.
2. Install PE corrugated sewer piping according to ASTM D 2321.

3.03 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
2. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.04 CATCH BASIN INSTALLATION

A. Set frames and grates to elevations indicated.

B. Follow structure manufacturer's written instructions

3.05 IDENTIFICATION

A. Materials and their installation are specified in Section 312000 “Earth Moving". Arrange for installation of warning tape directly over piping and at outside edge of underground structures in accordance with CT DOT and utility requirements.

3.06 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (610 mm) of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    c. Infiltration: Water leakage into piping.
    d. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

END OF SECTION