TOWN OF GLASTONBURY

INVITATION TO BID

BID #	ITEM	DATE & TIME REQUIRED
GL-2017-39	New Addition Glastonbury Town Hall	August 22, 2017 @ 11:00 a.m.

The Town of Glastonbury is seeking bids for a New Addition to the Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033

A non-mandatory pre-bid meeting and site walk through will be held starting at the Glastonbury Town Hall Entrance, 2155 Main Street, Glastonbury, CT 06033 on Thursday, August 3, 2017 at 9:00 a.m. All bidders are encouraged to attend.

Bid Forms, Plans and Specifications may be obtained at no cost from the Town's website at www.glastonbury-ct.gov or the State of Connecticut Department of Administrative Services website at www.das.state.ct.us.

Prevailing Wages: The contractor must comply with Section 31-53 of the Connecticut General Statutes as amended, including annual adjustments in prevailing wages.

Bid Security shall be issued payable to the "Town of Glastonbury" in the form of a certified check or Bid Bond in an amount not less than 10% of the total amount of the base bid. The Bid Bond must be issued by a surety company licensed in the State of Connecticut. Cashier's checks will not be accepted.

The Town reserves the right to waive informalities or reject any part of, or the entire bid, when said action is deemed to be in the best interest of the Town. All Sealed Bids must be submitted to the Office of the Purchasing Agent no later than the time and date indicated. All bids will be publicly opened and read.

The Town of Glastonbury is an Affirmative Action/Equal Opportunity Employer.
Minority/Women/Disadvantaged Business Enterprises are encouraged to bid.

Mary F. Visone
Purchasing Agent

1. Sealed bids **(one original and one copy)** on the attached Bid Forms will be received at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut, 06033 (second level). At the designated time of opening, they will be publicly opened, read, recorded and placed on file.

2. Whenever it is deemed to be in the best interest of the Town, the Town Manager, Purchasing Agent or designated representative shall waive informalities in any and all bids. The right is reserved to reject any bid, or any part of any bid, when such action is deemed to be in the best interest of the Town of Glastonbury.

3. The basis of award will be based on the lump sum base bid plus the sum of any alternate(s) accepted by the Owner of the lowest qualified, responsible and responsive bidder.

4. Bids will be carefully evaluated as to conformance with stated specifications.

5. The envelope enclosing your bid should be clearly marked by your company name and address, bid number, time of bid opening, and date.

6. Specifications must be submitted complete in every detail and, when requested, samples shall be provided. If a bid involves any exception from stated specifications, they must be clearly noted as exceptions, underlined, and attached to the bid.

7. The Bid Documents contain the provisions required for the requested item. Information obtained from an officer, agent, or employee of the Town or any other person shall not affect the risks or obligations assumed by the Bidder or relieve him/her from fulfilling any of the conditions of the bid.

8. Each Bidder is held responsible for the examination and/or to have acquainted themselves with any conditions at the job site which would affect their work before submitting a bid. Failure to meet these criteria shall not relieve the Bidder of the responsibility of completing the bid without extra cost to the Town of Glastonbury.

9. Any bid may be withdrawn prior to the above-scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and the date specified shall not be considered. No bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof. Should there be reasons why a bid cannot be awarded within the specified period, the time may be extended by mutual agreement between the Town and the Bidder.

10. Each bid must be accompanied by a bid bond payable to the Town for ten percent (10%) of the total amount of the bid. The bid bond of the successful bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond. The Town of Glastonbury will not be liable for the accrual of any interest on any certified check submitted. Cashier's checks will not be accepted.

11. A 100% Performance and Payment bond is required of the successful bidder. This bond shall cover all aspects of the specification and shall be delivered to the Purchasing Agent prior to the issuance of a purchase order. The Performance and Payment Bond will be returned upon the delivery and acceptance of the bid items.

12. The Bidder agrees and warrants that in the submission of this sealed Bid, they will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religion, national origin, sex, or physical disability including, but not limited to blindness, unless it is shown by such Bidder that such disability prevents performance of that which must be done to successfully fulfill the terms of this sealed Bid or in any manner which is prohibited by the laws of the United States or the State of Connecticut: and further agrees to provide the Human Relations Commission with such information requested by the Commission concerning the employment practices and procedures of the Bidder. An Affirmative Action Statement will be required by the successful Bidder.

13. Bidder agrees to comply with all of the latest Federal and State Safety Standards and Regulations and certifies that all work required in this bid will conform to and comply with said standards and regulations. Bidder further agrees to indemnify and hold harmless the Town for all damages assessed against the Town as a result of Bidder's failure to comply with said standards and/or regulations.

14. All correspondence regarding any purchase made by the Town of Glastonbury shall reference the Town purchase order number. Each shipping container shall clearly indicate both purchase order number and item number.

15. Bidder is required to review the Town of Glastonbury Code of Ethics adopted July 8th, 2003 and effective August 1, 2003 and revised October 29, 2013 and effective November 28, 2013. Bidder shall acknowledge that they have reviewed the document in the area provided on the bid / proposal response page (BP). The selected Bidder will also be required to complete and sign an Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgement Form can be accessed at the Town of Glastonbury website at **www.glastonbury-ct.gov.** Upon entering the website click on **Bids & Proposals Icon**, which will bring you to the links for the **Code of Ethics** and the **Consultant Acknowledgement Form**. If the Bidder does not have access to the internet a copy of these documents can be obtained through the Purchasing Department at the address listed within this bid / proposal.

16. Any bidder, in order to be considered, shall be engaged primarily in the business of construction with for minimum of five (5) years and have a valid contractor's license in the State of Connecticut.

17. **Non-Resident Contractors (IF APPLICABLE):Resident Contractors:**

    Upon award the Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that Employment Taxes and other applicable taxes are being paid by Contractors. **A single surety bond for 5% of the entire contract price is required to be filed with DRS by any unverified nonresident prime or general contractor (if awarded) where the contract price for the project is $250,000 or more.** The contractor will be required to promptly furnish to the Town a copy of the **Form AU-968 - Certificate of Compliance** issued by the State of Connecticut, DRS. See State of Connecticut **Notice SN 2012 (2)**.

18. Bidder shall include on a sheet(s) attached to its proposal a complete disclosure of all past and pending mediation, arbitration and litigation cases that the bidder or its principals (regardless of their place of employment) have been involved in for the most recent five years. Please include a

statement of the issues in dispute and their resolution. Acceptability of Bidder based upon this disclosure shall lie solely with the Town.

19. Bidder or its principals, regardless of their place of employment, shall not have been convicted of, nor entered any plea of guilty, or nolo contendere, or otherwise have been found civilly liable or criminally responsible for any criminal offense or civil action. Bidder shall not be in violation of any State or local ethics standards or other offenses arising out of the submission of bids or proposals, or performance of work on public works projects or contracts.

20. After award of Contract, Owner will require the Contractor's Schedule of Values, which shall be submitted at the preconstruction meeting. The Schedule of Values must accurately reflect job costs and include a complete breakdown of material and labor costs.

21. Prevailing Wage Rates:

    Bidders shall comply with State Statutes concerning Employment and Labor Practices, if applicable, and Section 31-53 of the Connecticut General Statutes, as amended (Prevailing Wages). Wage Rate Determination for this project from the State of Connecticut is included in the Bid Documents. Certified payrolls for site labor shall be submitted weekly to the Town's Representative or his designee on the correct State of Connecticut form. The Town reserves the right to, without prior notice, audit payroll checks given to workers on site in order to ascertain that wages and fringe benefits are being paid as required by the State of Connecticut. Please make special note of the State requirement to adjust wage and fringe benefit rates on each July 1st following the original published rates.

    NOTE that bidder is to include in its bid proposal all costs required by such annual increases in the PREVAILING RATES. No Escalation Clauses are to be included in the bidder's proposal and no Escalation Clauses will be in the Contract Agreement. Bidder is to anticipate any future increases and include these costs in its quotation.

    Contractor's invoices will not be paid if certified payrolls are incomplete, incorrect or not received in a timely manner.

    All Apprentices must be registered with the State of Connecticut and their number shall not exceed the number allowed by law. Otherwise, all workers must be paid at least the Journeyman rate listed including benefits.

    OSHA SAFETY AND HEALTH CERTIFICATION: Effective July 1, 2009: Any Mechanic, Laborer, or Worker, who performs work in a classification listed on the prevailing wage rate schedule on any public works project covered under C.G.S. Section 31-53, both on site and on or in the public building, must have completed a federal OSHA Safety and Health course within the last 5 years.

22. Each Bidder shall submit a list of similar projects completed within the last three years. In order to be eligible for consideration, the Bidder must have successfully completed a minimum of five (5) similar projects within the last three (3) years. Please provide project name and contact information for project coordinator (name, title, address, phone number). Please also provide contract value.

23. For technical questions regarding this Bid, please contact David Sacchitella, Building Superintendent, at (860) 652-7706, email dave.sacchitella@glastonbury-ct.gov. For administrative questions regarding this Bid, please contact Mary F. Visone, Purchasing Agent at (860) 652-7588, email purchasing@glastonbury-ct.gov . The request must be received at least three (3) business days prior to the advertised response deadline. All questions, answers, and/or addenda, as applicable, will be posted on the Town's website at www.glastonbury-ct.gov (Upon entering the website click on Bids & Proposals Icon; click the Bid Title to view all bid details and document links). It is the respondent's responsibility to check the website for addenda prior to submission of any proposal**.**

IMPORTANT:

- Failure to comply with general rules may result in disqualification of the Bidder.
- Municipal projects are exempt from Federal Excise Taxes, as well as, State of Connecticut Sales, Use and Service Taxes and should not be include in the Bidder's proposal.

01.00 WORKMANSHIP, MATERIALS AND EMPLOYEES

01.01 Wherever in this contract the word "Engineer" is used, it shall be understood as referring to the Building Superintendent of the Town of Glastonbury acting personally or through any assistants duly authorized.

01.02 The entire work described herein shall be completed in accordance with the plans and specifications to the full intent and meaning of the same. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and material shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

01.03 The wording "furnish", "install", "construct", "furnish and install", or any similar terms, unless specifically noted to the contrary, shall include all labor, materials, water, tools, equipment, light, power, transportation, and any other services required for the completion of the work.

01.04 The Contractor shall at all times enforce strict discipline and good order among his employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned to him.

02.00 SUPERINTENDENT

02.01 The Contractor shall keep on the work during its progress, in the absence of the Contractor, a competent Superintendent. The Superintendent shall be acceptable to the Engineer and shall fully represent the Contractor. All directions given to the Superintendent shall be binding as if given to the Contractor.

03.00 PRECONSTRUCTION MEETING

03.01 A Preconstruction Meeting will be held with the Engineer, Contractor, and any other interested parties prior to commencing any work. The Engineer shall arrange the meeting based on a mutually convenient time.

04.00 PERMITS

04.01 All permits, licenses, and fees required for the performance of the Contract work shall be secured and paid for by the Contractor. The local building permit fees will be waived.

05.00 PROPERTY ACCESS

05.01 The Contractor shall take all proper precautions to protect from injury or unnecessary interference, and provide proper means of access to abutting property where the existing access is cut off by the Contractor.

05.02 The Contractor shall take all proper precautions to protect persons from injury or unnecessary inconvenience and leave an unobstructed way along the public and private places for travelers, vehicles, and access to hydrants.

05.03 The Contractor shall make arrangements with the adjacent property owners for such trespass as he may reasonably anticipate in the performance of the work. All such arrangements shall be reported, in writing, to the Engineer.

06.00 PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY

06.01 The Contractor shall continuously maintain adequate protection of all work from damage, and shall take all reasonable precautions to protect the Town from injury or loss arising in connection with the Contract.

06.02 The Contractor shall adequately protect adjacent private and public property as provided by law and the Contract Documents.

06.03 The Contractor shall make good any damage, injury, or loss of work and to the property of the Town resulting from lack of reasonable protective precautions.

06.04 The police building involved will be occupied during the work and fully operational. The Contractor may be required to adjust his work schedule should the work have an adverse impact on operations. There will be no modification of the bid price should a schedule adjustment be required.

07.00 EXISTING IMPROVEMENTS

07.01 The Contractor shall conduct his work so as to minimize damage to existing improvements designated to remain. Except where specifically stated otherwise in the specifications, drawings, or as directed by the Engineer, it will be the responsibility of the Contractor to restore to their original condition, as near as practical, all improvements on public or private property. This shall include:

a. Property within and adjacent to the work area such as shrubs, walks, driveways, fences, etc.

b. Utility mains, ducts, poles, and services. The Contractor is hereby notified that utilities, if/where shown on the plans, are at approximate locations. These locations are subject to possible errors in the source of information and errors in transcription. The Contractor shall make certain of the exact location of all mains, ducts, poles, and services prior to excavation.

08.00 SEPARATE CONTRACTS

08.01 The Engineer reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. Wherever work being done by the Town of Glastonbury forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer to secure the completion of the various portions of the work.

09.00 INSPECTION OF WORK

09.01 The Town shall provide sufficient personnel for the inspection of the work.

09.02 The Engineer shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for inspection.

09.03 If the specifications or the Engineer's instructions require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection and, if the inspection is by another authority other than the Engineer, of the date fixed for such inspection. Inspections by the Engineer shall be made promptly. If any work should be covered up without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination and properly restored at the Contractor's expense.

09.04 Re-inspection of any work may be ordered by the Engineer. If such work is found to be in accordance with the Contract Documents, the Town shall pay the cost of re-inspection and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

10.00 RIGHT TO INCREASE OR DECREASE WORK

10.01 The Town shall have the right to increase or decrease the amount of work herein specified as may be required.

11.00 RIGHT OF ENGINEER TO STOP WORK FOR WEATHER CONDITIONS

11.01 Should the work, in the opinion of the Engineer, be in danger by reason of inclemency of weather, or could not be finished in time to prevent such danger, the Contractor shall cease operations upon order of the Engineer, and shall not resume them until ordered to do so by the Engineer when the weather conditions are favorable. The Contractor shall, upon such orders, discontinue work, remove all materials or appliances for or in use upon the work, and place the premises in proper condition for use by the public during the time the work is suspended as herein provided, without cost to the Town.

12.00 CONTRACTOR TO BE RESPONSIBLE FOR IMPERFECT WORK OR MATERIALS

12.01 Any faithful work or imperfect material that may be discovered before the acceptance and the payment of the work shall be corrected upon the order of the Engineer. The acceptance and payment of the work does not in any manner relieve the Contractor of his obligation to construct work in the proper manner and the use of materials herein specified.

13.00 TOWN MAY NOTIFY CONTRACTOR IF WORK IS NOT CARRIED ON SATISFACTORILY

13.01 If, in the opinion of the Engineer, the Contractor is not proceeding with the work at a sufficient rate of progress so as to finish in the time specified, or has abandoned said work, or is not complying with the terms and stipulations or the Contract and specifications, the Engineer may serve notice on the Contractor to adopt such methods as will ensure the completion of the work in the time specified.

13.02 If, within five days after the Engineer has notified the Contractor that his work is not being carried on satisfactorily as before mentioned, the Engineer shall have the right to annul the

Contract and manage the work under the direction of the Engineer, or re-let, for the very best interest of the Town as a new contract, the work under said new Contract shall be considered the responsibility of the defaulting Contractor.

13.03 Additional costs incurred over and above the original Contract shall be borne by the Performance Bond.

14.00 DEDUCTIONS FOR UNCORRECTED WORK

14.01 If the Engineer deems it inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made there for.

14.02 The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Town, and shall bear the expense of making good all work by other contractors destroyed or damaged by such removal or replacement.

14.03 If the Contractor does not remove such condemned work and materials as promptly as possible after written notice, the Engineer may remove them and store the materials at the expense of the Contractor.

15.00 CLEANING UP

15.01 The Contractor must remove all debris of every description as the work progresses and leave the surroundings in a neat and orderly condition to the satisfaction of the Engineer.

15.02 Upon completion, and before acceptance and final payment, the Contractor shall remove from the site all equipment, forms, surplus material, rubbish and miscellaneous debris and leave the site in a neat and presentable condition.

16.00 ROYALTIES AND PATENTS

16.01 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Town of Glastonbury harmless from loss on account hereof, except that the Town of Glastonbury shall be responsible for all such loss when a particular manufacturer, product, or process is specified by the Town of Glastonbury.

17.00 ERRORS OR CONFLICT IN DRAWINGS AND SPECIFICATIONS

17.01 The Contractor shall immediately notify the Owner/Engineer should he find any errors or conflicts in the contract documents. The Owner/Engineer shall render his interpretation or instruction in writing on the items as soon as possible.

17.02 Any work undertaken by the Contractor containing possible errors or conflicts will be done at his own risk unless he has received prior written approval from the Owner/Engineer.

17.03 The Contractor shall be responsible for estimating and supplying all quantities, and where clarification or additional information is required, a request in writing to the Owner/Engineer shall be made. No extra charge or compensation will be allowed the Contractor unless there is a change in scope or dimension of the project resulting in need for extra material, equipment and/or labor. Said differences are to be handled under Article 18.

18.00 EXTRA WORK AND EXTRA COST

18.01 The Owner, without invalidating the contract documents, may order extra work or make changes by altering, adding to or deducting from the work, the contract price being adjusted accordingly. All such work shall be executed under the conditions of the original contract except that any claim of extension of time caused thereby shall be adjusted at the time of ordering the change.

18.02 No extra work or change shall be performed unless in pursuance of a written order from the Owner/Engineer, with the agreed price prior to the commencement of the work, and no claim for an addition to the contract price shall be valid unless so ordered.

18.03 The value of any such work or change shall be determined, in one or more of the following ways:

a) By estimate and acceptance on a lump sum.
b) By unit prices named in the contract or subsequently agreed upon.
c) By cost and percentage or by cost and a final fee.

19.00 SUBSTITUTIONS

19.01 The Contractor shall use materials as specified unless material list is of an open nature. Material other than specified will be permitted only after written application, including four (4) copies of specifications, is made by the Contractor and written approval received from the Engineer or Owner.

The material installed in the job site shall be new and of the quality specified.

The manufacturer's recommendation shall be followed for the installation of all equipment.

20.00 PRODUCT SUBMITTALS

20.01 Prior to ordering materials, the Contractor shall submit submittals as specified in the detailed specification sections. Three (3) copies of the submittals shall be forwarded to the Engineer for review and approval.

20.02 Submittals shall indicate specification Section for each product. Submittals not containing all the required information shall be returned to the contractor for re-submittal.

21.00 OWNER'S ACCEPTANCE

21.01 Within seven (7) days of the Contractor's notification that the installation is substantially complete, the Owner's authorized representative shall inspect the installation. The Owner, with the Contractor, shall take necessary steps to inspect the installation. Upon completion of the inspection, the Owner or the Owner's authorized representative may either accept the work

outright or prepare a "Punch List" that upon completion by the Contractor and acceptance by the Owner will signify final acceptance provided that all other applicable terms and provisions of the Contract have been completed to the Owner's satisfaction.

22.00 RESPONSIBILITY FOR MAINTENANCE

22.01 It will be the Contractor's responsibility to maintain the work as specified in the detailed specifications during the warranty period.

23.00 SERVICE BY THE CONTRACTOR

23.01 The Contractor shall maintain the work as specified during the warranty period.

24.00 WARRANTY

24.01 The guarantee shall be as specified in the respective sections of the specification.

24.02 The Contractor shall be responsible for the repair and/or replacement of all defective work and materials. All repair work shall be completed in a timely fashion.

24.04 Should the Contractor not respond promptly, the Owner may take any action he deems necessary to repair the defect and prevent further damage to his property, including the hiring of another contractor, or the repairing of such a defect with material supplied by the Contractor. In this event, the Contractor shall be liable for expenses incurred and property damages suffered by the Owner.

01.00 NOTICE TO CONTRACTOR

01.01 Intent of Contract: The intent of the Contract is to prescribe a complete work or improvement which the Contractor undertakes to do, in full compliance with the specifications, plans, special provisions, proposal and Contract. The Contractor shall perform all work in close conformity with the plans or as modified by written orders, including the furnishing of all materials, supplies, transportation, labor, and all other things necessary to the satisfactory prosecution and completion of the project.

The scope of the work shall include all labor, materials and equipment needed to provide and install, and associated equipment and materials, complete and ready for use, as described in the plans and specifications for New Addition at Glastonbury Town Hall in Glastonbury, CT.

02.00 COMMUNICATIONS

02.01 All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

02.02 Any notice to, or demand upon, the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Agreement (or at such other office as the Contractor may, from time to time, designate) in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

02.03 All papers required to be delivered to the Town shall, unless otherwise specified in writing to the Contractor, be delivered to the Building Superintendent, 2143 Main Street, Glastonbury, CT 06033, and any notice to, or demand upon, the Town shall be delivered at the above address in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office or to such other representatives of the Town, or to such other address as the Town may subsequently specify in writing to the Contractor for such purpose.

02.04 Any such notice shall be deemed to have been given as of the time of actual delivery or, in case of mailing, when the same should have been received in due course of post or, in the case of telegrams, at the time of actual receipt, as the case may be.

03.00 WORK BY OTHERS

03.01 Private utilities, contractors, developers or other parties may be expected to be working within the Contract area during this Contract. It shall be the responsibility of the contractor to coordinate his work with the work being done by others in order that the construction shall proceed in an efficient and logical manner. The Contractor shall have no claim or claims whatever against the Town, the Engineer, or other parties due to delays or other reasons caused by the work by others or his failure to coordinate such work.

04.00 CONTRACTOR'S WORK AND STORAGE AREA

04.01 The Contractor shall contact the Town to determine if any specific locations will be designated, or gain its approval prior to using any area for storage of equipment, materials and trailers during the period of this Contract. The Contractor shall confine his work/storage area to the limits as

designated or approved and shall be responsible for the security of the work/storage area. Upon completion of the Contract, the Contractor shall remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Engineer and at no cost to the Town.

05.00 DISPOSAL AREA

05.01 The Tryon Street Bulky Waste Facility will be available to the Contractor, at no charge, for disposal of materials that are accepted at that facility. No materials containing lead-based paint of any level shall be dumped at the Tryon Street facility. The Contractor is required to obtain a disposal area for all other unsuitable or surplus materials at no cost to the Town.

06.00 DUST CONTROL

06.01 During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use water or calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed, without additional compensation.

07.00 PROTECTION OF EXISTING UTILITIES

07.01 Before starting any excavation, the Contractor shall submit to the Engineer plans or details showing the proposed method the Contractor will use to support and protect all existing utilities during construction. The furnishing of such plans and details shall not serve to relieve the Contractor of any responsibility for the proper conduct of the work.

07.02 There will be no extra payment for submitting plans or details for supporting and protecting all existing utilities during construction.

08.00 TIME FOR COMPLETION/NOTICE TO PROCEED

08.01 Within ten (10) calendar days after the date of the Notice of Award, the Contractor must provide the appropriate insurance certificates to the Town Purchasing Agent and shall be issued a Notice to Proceed and a Purchase Order prior to initiating any work on the project.

08.02 Work shall commence within thirty (30) days of the date of the Notice to Proceed/Purchase Order.

08.03 After the work has begun, it will continue in an orderly fashion and shall be fully completed within 145 consecutive calendar days from the date of commencement. The Engineer reserves the right to extend the contract an additional thirty (30) days by mutual written agreement.

08.04 It is the intention of the Town to have all work required under this Contract completed no later than December 31, 2017. In no case, however, shall the work be completed any later than January 31, 2018.

08.05 Because the facilities remain open during the installation period, the Contractor shall make every reasonable effort to complete the installation as expeditiously as possible.

09.00 MEASUREMENT AND PAYMENT

09.01 All direct, indirect, or incidental costs of work and/or services required by these specifications shall be included in the Lump Sum price.

09.02 Monthly progress payments will be made, based on the approved Schedule of Values, for work that has progressed in accordance with the contract documents, subject to a deduction of five percent (5%) of the amount of the application for payment to be retained by the Owner until completion of the entire contract in an acceptable manner and two and one half percent (2.5%) until the applicable one year warranty period has expired and all required inspections have been completed and results have been submitted and approved by the Engineer.

10.00 COMPLIANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS

10.01 This award of bid is subject to the conformance of the Contractor to all Federal, State, and Local laws, statutes, regulations, ordinances or other requirements that are applicable to the type of work contained in these specifications.

INSURANCE

The Bidder shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering the Bidder and all of its agents, employees and sub-contractors and other providers of services and shall name the **Town of Glastonbury and its employees and agents as an Additional Insured** on a primary and non-contributory basis to the Bidders Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Bidders Certificate of Insurance.** Insurance shall be written with insurance carriers approved in the State of Connecticut and with a minimum Best's Rating of A-VIII. In addition, all carriers are subject to approval by the Town. Minimum Limits and requirements are stated below:

1) Worker's Compensation Insurance:
- Statutory Coverage
- Employer's Liability
- $500,000 each accident/$500,000 disease-policy limit/$500,000 disease each employee
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

2) Commercial General Liability:
- Including Premises & Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors.
- Limits of Liability for Bodily Injury and Property Damage
  Each Occurrence $1,000,000
  Aggregate $2,000,000 (The Aggregate Limit shall apply separately to each job.)
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

3) Automobile Insurance:
- Including all owned, hired, borrowed and non-owned vehicles
- Limit of Liability for Bodily Injury and Property Damage: Per Accident $1,000,000
- A Waiver of Subrogation shall be provided in favor of the Town of Glastonbury and its employees and agents.

The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Contractor shall be responsible to notify the Town 60 days in advance with written notice of cancellation or non-renewal. The Certificate shall evidence all required coverage. The Bidder shall provide the Town copies of any such insurance policies upon request.

INDEMNIFICATION

To the fullest extent permitted by law, the Bidder shall indemnify and hold harmless the Town of Glastonbury and its consultants, agents, and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, attorneys and other professionals and court and arbitration costs) to the extent arising out of or resulting from the performance of the Bidder's work, provided that such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission by the Bidder, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Bidder to perform or furnish either of the services, or anyone for whose acts the Bidder may be liable.

TOWN OF GLASTONBURY **BID #GL-2017-39**
New Addition Town Hall
LIST OF DRAWINGS

GENERAL

G-000	COVER
G-001	LIST OF DRAWINGS, GENERAL NOTES, SYMBOLS LEGEND, & ABBREVIATIONS

ARCHITECTURAL

D-101	PARTIAL DEMO PLAN
A-101	PARTIAL FIRST FLOOR PLAN & PARTIAL ROOF PLAN
A-201	PARTIAL REFLECTED CEILING PLAN
A-301	EXTERIOR ELEVATIONS
A-401	BUILDING SECTIONS
A-410	SECTION DETAILS
A-411	SECTION DETAILS
A-420	PLAN DETAILS

STRUCTURAL

S-100	GENERAL NOTES
S-200	FOUNDATION PLAN
S-201	ROOF FRAMING PLAN
S-210	COLUMN SCHEDULE & BASEPLATE DETAILS
S-300	TYPICAL DETAILS
S-400	SECTIONS

MECHANICAL *

M-1	TOWN HALL ENTRANCE PART-PLAN – MECHANICAL DEMOLITION AND NEW WORK
M-2	MECHANICAL SCHEDULES AND DETAILS
M-3	MECHANICAL SPECIFICATIONS

ELECTRICAL *

E-1	TOWN HALL ENTRANCE PART PLAN – ELECTRICAL DEMOLITION
E-2	TOWN HALL ENTRANCE PART PLAN – LIGHTING AND POWER
E-3	DETAILS AND SCHEDULES

* Mechanical & Electrical Information Only: Coordination with Owner's separate projects will be required as per Section 024119-2. Drawings will be provided to the selected vendor upon request.

TOWN OF GLASTONBURY * 2155 MAIN STREET * GLASTONBURY * CT

BID / PROPOSAL NO: **GL-2017-39** **DATE DUE:** **08-22-17**

DATE ADVERTISED: **07-27-17** **TIME DUE:** **11:00 AM**

NAME OF PROJECT: **New Addition Glastonbury Town Hall**

In compliance with this Invitation to Bid, the Bidder hereby proposes to provide goods and/or services as per this solicitation in strict accordance with the Bid Documents, within the time set forth therein, and at the prices submitted with their bid response.

It is the responsibility of the Bidder to clearly mark the outside of the bid envelope with the Company name and Address, Bid Number, Date and Time of Bid Opening, and it also THE RESPONSIBILITY OF THE BIDDER TO CHECK THE TOWN'S WEBSITE BEFORE SUBMITTING BID FOR ADDENDA POSTED PRIOR TO BID OPENING.

THE BIDDER ACKNOWLEDGES RECEIPT OF THE FOLLOWING ADDENDA AS REQUIRED:

Addendum #1 _____(Initial/Date) **Addendum #2** _____ (Initial/Date) **Addendum #3** _____(Initial/Date)

Other Items Required with Submission of Bid Proposal
The following bid checklist describes items required for inclusion with the above-referenced bid proposal package. It is provided for the convenience of the bidders and, therefore, should not be assumed to be a complete list.

_____ Bid Bond (10% of total bid amount).

_____ List of five (5) similar projects completed within last three (3) years.

_____ Acknowledgement of Addendums (as applicable).

_____ Acknowledgement of Code of Ethics on Bid Proposal page.

_____ Sealed bids, one original and one copy.

_____ Disclosure of past and pending mediation, arbitration and litigation cases that the Bidder or its principals have been involved in for the most recent five years (if applicable).

_____ Copy of Bidder's Contractor's License (State of Connecticut).

Name of Bidder: _____

TOTAL LUMP SUM BASE BID AMOUNT:

Furnish and install New Addition at Glastonbury Town Hall as specified in the Plans and Specifications for Bid GL-2017-39.

$_____
(Numeric Base Bid Amount)

_____
(Written Base Bid Amount)

ADD - ALTERNATE #1:

Contractor provided new revolving entrance door (Section 012300-2) **$ _____**
(Numeric Alternate Amount)

_____
(Written Alternate #1 Amount)

ADD - ALTERNATE #2:

Exterior transom to be fabricated from custom aluminum extrusion in profiles matching PVC trim (Section 012300-2) **$ _____**
(Numeric Alternate Amount)

_____
(Written Alternate #2 Amount)

NON-COLLUSION STATEMENT:
By submission of this bid, the Bidder certifies, and in the case of a joint bid each party thereto certifies as to their own organization that this bid has been arrived at independently without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

CODE OF ETHICS:
I / We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I /We are selected. Yes _____ No _____ *

***Bidder is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any bid or proposal where the bidder has not agreed to the above statement.**

Print Name, Title of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Date	**City, State, Zip Code**
E:mail Address	**Telephone Number / Fax Number**

Minimum Rates and Classifications for Building Construction

ID# : B 23845

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: GL-2017-39
State#:

Project Town: Glastonbury
FAP#:

Project: Addition To Town Hall

CLASSIFICATION	Hourly Rate	Benefits
1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, & finishes to all types of mechanical systems; application of firestopping material for wall openings & penetrations in walls, floors, ceilings	38.25	27.96
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**		
1c) Asbestos Worker/Heat and Frost Insulator	39.00	28.76

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2) Boilermaker	38.34	26.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	33.48	30.61 + a
3b) Tile Setter	34.90	24.69
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.70	21.02
3e) Plasterer	33.48	30.61

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Project: Addition To Town Hall

------LABORERS------

4) Group 1: Laborers (common or general), acetylene burners, carpenter tenders, concrete specialists, wrecking laborers, fire watchers.	29.25	19.50
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	29.50	19.50
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	29.75	19.50
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.	29.75	19.50
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	29.75	19.50

4e) Group 6: Blasters, nuclear and toxic waste removal.	31.00	19.50
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	30.25	19.50
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	28.38	19.50
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	27.86	19.50
4i) Group 10: Traffic Control Signalman	16.00	19.50
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.	32.60	25.34

5a) Millwrights	33.14	25.74
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)	39.15	25.17+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	50.14	31.585+a+b
-----LINE CONSTRUCTION----		
Groundman	25.93	6.5% + 8.53
Linemen/Cable Splicer	47.14	6.5% + 20.98

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8) Glazier (Trade License required: FG-1,2)	35.58	20.15 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	35.47	33.39 + a
----OPERATORS----		
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)	39.30	24.05 + a
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)	38.98	24.05 + a
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)	38.24	24.05 + a

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	37.85	24.05 + a
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" Mandrell)	37.26	24.05 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	37.26	24.05 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	36.95	24.05 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrell).	36.61	24.05 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	36.21	24.05 + a

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).	35.78	24.05 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	33.74	24.05 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	33.74	24.05 + a
Group 12: Wellpoint operator.	33.68	24.05 + a
Group 13: Compressor battery operator.	33.10	24.05 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	31.96	24.05 + a

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	31.55	24.05 + a
Group 16: Maintenance Engineer/Oiler.	30.90	24.05 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	35.21	24.05 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	32.79	24.05 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	32.02	20.15

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10b) Taping Only/Drywall Finishing	32.77	20.15
10c) Paperhanger and Red Label	32.52	20.15
10e) Blast and Spray	35.02	20.15
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	41.62	30.36
12) Well Digger, Pile Testing Machine	33.01	19.40 + a
13) Roofer (composition)	34.92	19.28

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14) Roofer (slate & tile)	35.42	19.28
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	37.18	34.29
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)	41.62	30.36
------TRUCK DRIVERS------		
17a) 2 Axle	29.13	22.32 + a
17b) 3 Axle, 2 Axle Ready Mix	29.23	22.32 + a

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17c) 3 Axle Ready Mix	29.28	22.32 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	29.33	22.32 + a
17e) 4 Axle Ready Mix	29.38	22.32 + a
17f) Heavy Duty Trailer (40 Tons and Over)	29.58	22.32 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	29.38	22.32 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	43.92	15.84 + a

19) Theatrical Stage Journeyman	25.76	7.34

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 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $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 each apprentice in a specific trade.

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.ct.gov/dol. For those without internet access, please contact the division listed below.

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.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

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Project: Addition To Town Hall

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 Person 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.

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SECTION 012300 - 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.

D. PRODUCTS (Not Used)

PART 2 - EXECUTION

2.1 SCHEDULE OF ALTERNATES

2.1 SCHEDULE OF ALTERNATES

A. **ADD Alternate No. 1:** Provide and Install New Revolving Entrance Door

1. **Base Bid:** Install **Owner provided** new revolving door package as specified in Section 084233. Contractor is responsible for the following:

- Review of Submittals, Shop Drawings, and Product Information Supplied by the
- Owner.
- Review of Materials provided by the Owner to assure all components have been
- received for a complete installation, including
- Review of Action, Informational and Closeout Submittals, Quality Assurance and Warranties.

2. **ADD Alternate:-Contractor provided** new revolving door package as specified in Section 084233, in its entirety. Install cost shall be included only in the base bid, NOT in Alternate No. 1.

B. **ADD Alternate No. 2**: Alternate Exterior Transom material

1. **Base Bid:** Exterior Transom trim to be installed using PVC trim as indicated on documents.
2. **ADD Alternate:** Exterior Transom to be fabricated from custom aluminum extrusion in profiles matching PVC trim.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Substitutions Requests for substitutions of any major components or systems **to be submitted with BID** for consideration.

C. Related Requirements:

1. Section 016000 "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. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies 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. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of 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 substitutions 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. Detailed comparison of Contractor's construction schedule using proposed substitutions 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.
g. Cost information, including a proposal of change, if any, in the Contract Sum.
h. 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.
i. 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.

2. 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 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.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution of any major components of the project with BID. Substitutions for related items shall be submitted 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. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. 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: Architect will consider requests for substitution if received with BIDS, unless noted otherwise in product specifications. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.

h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. 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.

END OF SECTION 012500

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name/Date
2. Name of Architect/Owner.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

B. 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.

C. 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 10 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.
2. Resubmittal Review: Allow 10 days for review of each resubmittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams that show factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.

4. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

E. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

F. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding

Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.7 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and paper copies of certificate, signed and

sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.

1. PDF Submittals: Architect will markup on each submittal, the appropriate action.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will return without review submittals received from sources other than Contractor.

END OF SECTION 013300

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.3 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

E. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - EXECUTION

2.1 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

2.2 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Coordination with Owners Separate Projects: Coordinate with the work of Owners Separate Projects, including, but not limited to the following:
1. Sitework, grading, sidewalks, paving, planting, lighting and site amenities.
2. Electrical Work
3. Mechanical Work.

D. Removed and Salvaged Items:

1. Clean salvaged items.
2. Transport items to Owner's storage area designated by Owner.
3. Protect items from damage during transport and storage.

E. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

2.3 CLEANING

A. Remove demolition waste materials from Project site

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified in this section.

1.2 QUALITY ASSURANCE:

A. Codes and Standards: Comply with provisions of following Codes, Specifications and standards, except where more stringent requirements are shown or specified:

1. American Concrete Institute, ACI, "Specifications for Structural Concrete for Buildings" ACI 301 latest revision.

2. Concrete Reinforcing Steel Institute, CRSI, "Manual of Standard Practice" latest edition.

B. Concrete Testing Service: Employ at contractor's expense a testing laboratory to perform materials evaluation test and to design concrete mixes.

C. Owner: Employ separate testing laboratory to evaluate concrete delivered to and placed at site.

D. Certificates: Signed by concrete producer and Contractor, may be submitted in lieu of material testing when acceptable to Engineer.

1.3 SUBMITTALS:

A. Manufacturer's Data: Submit manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, admixtures, joint materials, hardeners, curing materials and others as requested by Engineer.

B. Laboratory Reports: Submit 2 copies of laboratory test or evaluation reports for concrete materials and mix designs.

C. Shop Drawings Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" latest edition, showing bar schedules, stirrup spacing, diagrams of bent bars, placing plans and wall elevations showing arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures. Reproduction of the Engineers Contract Drawings are not acceptable for use as shop drawings.

PART 2 - PRODUCTS

2.1 FORM MATERIALS:

A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.

2.2 REINFORCING MATERIALS:

A. Reinforcing Bars: ASTM A615, Grade 60, deformed.

B. Welded wire fabric (WWF): ASTM A185, welded steel wire fabric.

2.3 CONCRETE MATERIALS:

A. Portland Cement: ASTM C 150, Type 1 use one brand of cement throughout project.

B. Normal weight aggregates: ASTM C33, Provide aggregates from a single source for exposed concrete.

C. Light-weight aggregates: ASTM C330

D. Water: Potable.

E. Air Entraining Admixture: ASTM C260.

F. Water reducing Admixture: ASTM C494, Type A. and not contain more chloride ions than are present in municipal drinking water.

2.4 RELATED MATERIALS:

A. Waterstops: Flat dumbbell or centerbulb type, size to suit joints, of either rubber (CRD C 513) or PVC (CRD C 572).

B. Moisture Barrier: Clear 10-mils thick polyethylene.

C. Membrane-Forming Curing Compound: ASTM C 309, Type 1.

2.5 PROPORTIONING AND DESIGN OF MIXES:

A. Prepare design mixes for each type and strength of concrete in accordance with ACI 301 Section 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixtures", Chapter 3 as indicated on drawings.

B. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by Engineer.

C. Use air entraining admixture in all concrete, providing not less than 4% nor more than 8% entrained air for concrete exposed to freezing and thawing, and from 2% to 4% for other concrete.

D. Do not use admixtures containing calcium chloride for concrete which is to be placed on metal decking.

2.6 CONCRETE MIXING:

A. Ready mix concrete shall be in accordance with ASTM C94.

B. For Job-site mixing use drum type batch machine mixture, mixing not less than 1-1/2 minutes for one cu. yd. or smaller capacity. Increase mixing time at least 15 seconds for each additional cu. yd. or fraction thereof.

PART 3 - EXECUTION

3.1 FORMWORK:

A. Construct formwork complying with ACI 347 "Recommended Practice for Concrete Formwork", so that concrete members and structures are of correct size, shape, alignment, elevation and position.

B. Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items built into forms.

C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required, re-tighten forms during concrete placement if required to eliminate mortar leaks.

3.2 PLACING REINFORCEMENT:

A. Comply with CRSI, recommended practice for "Placing Reinforcing Bars".

B. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

C. Install welded wire fabric in as long lengths as practical, lapping at least one mesh.

3.3 JOINTS:

A. Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as to not impair strength and appearance of structure. Place isolation and control joints in slabs- on-ground to stabilize differential settlement and random cracking.

3.4 INSTALLATION OF EMBEDDED ITEMS:

A. Set and build into work, anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in- place concrete. Use setting diagrams, templates and instructions provided by others for locations and setting.

3.5 CONCRETE PLACEMENT:

A. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.

B. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into forms.

C. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing comply with ACI 318 and other ACI documents referenced therein.

3.6 CONCRETE FINISHES:

A. Provide a smooth finish for exposed concrete surfaces and surfaces that are to be covered with a coating or covering material applied directly to concrete. Remove fins and projections, patch defective areas with cement grout, and rub smooth.

B. Apply trowel finish to monolithic slab surfaces that are exposed-to-view or are to be covered with resilient flooring, paint or other thin film coating. Consolidate concrete surfaces by finish troweling, free of trowel marks, uniform in texture and appearance.

3.7 CONCRETE CURING AND PROTECTION:

A. Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.

3.8 QUALITY CONTROL:

A. Owner's testing laboratory will perform sampling and testing during concrete placement, which may include the following, as directed by Engineer. This testing does not relieve Contractor of responsibility of providing concrete in compliance with specifications. Contractor may perform additional testing as necessary, at no expense to Owner, to ensure quality of concrete.

1. Sampling: ASTM C 172.

2. Slump: ASTM C 143, one for each set of compressive strength specimens.

3. Air content: ASTM C 173, one for each set of compressive strength specimens.

4. Compressive strength: ASTM C 39, one set for each 50 cu. yds, or fraction thereof of each class of concrete; 1 specimen tested at 7 days, 2 specimens tested at 28 days, and one retained for later testing if required.

   When the total quantity of given class of concrete is less than 50 cu. yds., strength tests may be waived by Engineer if field experience indicates evidence of satisfactory strength.

B. Test results will be reported in writing to Engineer, Contractor, and concrete producer on same day tests are made.

END OF SECTION 03300

SECTION 042613 - MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Clay face brick.

B. Products Installed but Not Furnished under This Section:

1. Steel shelf angles for supporting masonry veneer.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type and color of brick and colored mortar.

1.3 PRE –INSTALLATION CONFERENCE:

Coordinate an onsite meeting with Architect and Owner to review Brick and Stone material color options for selection and incorporation prior to beginning Mock-up.

1.4 COORDINATED MOCKUP

A. Provide mock-up of Cast Stone Masonry, in combination with 4’-0” x 4’0” Brick Mock- up, including flashing, type and color of brick, mortar type and color, joint type, weep holes and cast stone sill piece window sill piece with flashing, aluminum/wood window sill and flashing for verification 10 days prior to start of installation, in separate location onsite as determined by owner.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product.

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.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

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 will be exposed in the completed Work.

2.2 BRICK

A. Shapes: 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.

B. Color and variation: Provide a full array of brick samples matching adjacent building brick indicating variation of brick.

C. Clay Face Brick: Facing brick complying with ASTM C 216.

1. Face Brick: Provide one of the following:
   a. Manufacturer: Redland Brick, Rocky Ridge Plant
      1) Style: CY 415 Middle Plantation
      2) Grade SW
      3) Type FBS
   b. Manufacturer: Redland Brick, Rocky Ridge Plant
      1) Style: CU 455 Milva
      2) Grade SW
      3) Type FBS
   c. Manufacturer: Glen-Gery Brick, Mid-Atlantic Plant
      1) Style: 56-DD Awnex
      2) Grade SW
      3) Type FBS

2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

2.3 MORTAR 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. Colored Cement Products: Packaged blend made from Portland cement and hydrated and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Portland Cement-Lime Mix:

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Lafarge North America Inc.
2) Lehigh Hanson; HeidelbergCement Group.

F. Aggregate for Mortar: ASTM C 144.

1. White-Mortar Aggregates: Natural white sand or crushed white stone.
2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Water: Potable.

2.4 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.

C. 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. Fabricate wire connector sections from 0.187-inch-diameter, hot-dip galvanized, carbon-steel wire.
5. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
6. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with a projecting vertical tab having a slotted hole for inserting wire tie.

    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

        1) Hohmann & Barnard, Inc.

7. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having holes for inserting vertical legs of wire tie formed to fit anchor section.

    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

        1) Hohmann & Barnard, Inc.
        2) Wire-Bond.

8. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a sheet metal anchor section, 1-1/4 inches wide by 9 inches long, with screw holes top and bottom and with raised rib-stiffened strap, 5/8 inch wide by 5-1/2 inches long, stamped into center to provide a slot between strap and base for inserting wire tie.

    a. Manufacturers: Subject to compliance with requirements, provide products by the following:

        1) Hohmann & Barnard, Inc.

9. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a sheet metal anchor section, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom and with raised rib-

stiffened strap, 5/8 inch wide by 3-5/8 inches long, stamped into center to provide a slot between strap and base for inserting wire tie.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Hohmann & Barnard, Inc.
2) Wire-Bond.

10. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a gasketed sheet metal anchor section, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and base for inserting wire tie.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Hohmann & Barnard, Inc.
2) Wire-Bond.

11. Polymer-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 organic polymer coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B 117.

2.5 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.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. 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 0.040 inch.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) GCP Applied Technologies Inc. (formerly Grace Construction Products).

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.

2.6 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.

B. Weep/Vent Products: Use 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.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Heckmann Building Products, Inc.
2) Hohmann & Barnard, Inc.

C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Heckmann Building Products, Inc.
b. Hohmann & Barnard, Inc.
c. Mortar Net Solutions.

2. 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 1-1/2 inches thick and 10 inches 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.

2.7 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.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. PROSOCO, Inc.

2.8 MORTAR 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. 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. Use Type N unless another type is indicated.

C. Pigmented Mortar: Use colored cement product

1. Pigments shall not exceed 10 percent of Portland cement by weight.
2. Application: Use pigmented mortar for exposed mortar joints.

D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Mix to match existing building joints.
2. Application: Use colored aggregate mortar for exposed mortar joints.

PART 3 - EXECUTION

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.

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 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.

3.4 MORTAR BEDDING AND JOINTING

A. Lay 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.

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

3.5 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:

1. Fasten anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections 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 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.

B. Provide not less than 1 1/2 inches of airspace between back of masonry veneer and face of insulation.

3.6 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. 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 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.
3. 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.

4. 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.

C. Install weep holes in veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/vent products to form weep holes.
2. Space weep holes 24 inches o.c. unless otherwise indicated.

D. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

E. Install vents in head joints in exterior Wythe’s at spacing indicated. Use specified weep/vent products to form vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.7 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. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Protect adjacent stone and non-masonry surfaces from contact with cleaner.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 042613

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-stone masonry.

1.2 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.

1.3 COORDINATED MOCKUP

A. Provide mock-up of Cast Stone Masonry, in combination with 4’-0” x 4’0” Brick Mock- up, including flashing and cast stone window sill, aluminium/wood window sill and flashing for verification 10 days prior to start of installation, in separate location onsite as determined by owner.

1.4 IORMATIONAL 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.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units 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.

PART 2 - PRODUCTS

2.1 CAST-STONE UNITS

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. Continental Cast Stone

B. Cast-Stone Units: Comply with ASTM C 1364.

C. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.

1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
3. Provide drips on projecting elements unless otherwise indicated.

D. Cure Units as Follows:

1. Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 105 deg F for 6 hours, within 12 hours of fabrication.
2. Keep units damp and continue curing to comply with one of the following:

   a. No fewer than five days at mean daily temperature of 70 deg F or above.
   b. No fewer than six days at mean daily temperature of 60 deg F or above.
   c. No fewer than seven days at mean daily temperature of 50 deg F or above.
   d. No fewer than eight days at mean daily temperature of 45 deg F or above.

E. Remove blemishes from exposed surfaces before packaging for shipment.

F. Colors and Textures: As selected by Architect from manufacturer's full range.

2.2 ACCESSORIES

A. Anchors: fabricated from steel complying with ASTM A 36/A 36M and hot-dip galvanized to comply with ASTM A 123/A 123M.

B. Dowels: 1/2-inch-diameter round bars, fabricated from steel complying with ASTM A 36/A 36M and hot-dip galvanized to comply with ASTM A 123/A 123M.

2.3 MORTAR

A. Comply with requirements in Section 042000 "Unit Masonry" for mortar mixes.

1. For setting mortar, use Type N.
2. For pointing mortar, use Type N

B. Pigmented Mortar: Use colored cement product.

PART 3 - EXECUTION

3.1 SETTING CAST STONE IN MORTAR

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

B. Set units in full bed of mortar with full head joints unless otherwise indicated.

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. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.

1. Keep joints free of mortar and other rigid materials.
2. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.2 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

A. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.

1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.

B. Fill anchor holes with sealant.

1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.

C. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.

D. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 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.

1. Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 047200

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

A. Extent of structural steel work is shown on drawings, including schedules, notes, details and type of steel required.

B. Structural steel is that work defined in American Institute of Steel Construction, AISC, "Code of Standard Practice" and as otherwise shown on drawings.

C. The following related work is specified elsewhere in Division 5.

1. Miscellaneous Metal Fabrications

2. Metal Decking

1.03 QUALITY ASSURANCE:

A. Codes and Standards: Comply with Provisions of following except as otherwise indicated:

1. AISC "Code of Standard Practice for Steel Buildings and Bridges".

2. AISC "Specifications for Structural Steel Buildings" Allowable Stress Design and Plastic Design", Ninth Edition, including the "Commentary" and Supplements thereto as issued.

3. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" Latest Edition, approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.

4. American Welding Society, AWS, D1.1 "Structural Welding Code".

5. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".

6. ASTM A 123 "Zinc Coatings on Products Fabricated from Rolled, Pressed and Formed Steel Shapes, Plates, Bars and Strips."

7. American Hot Dip Galvanizers Association, "Inspection Manual for Hot Dip Galvanized Products".

B. Fabricator Qualifications: Fabricator must have a minimum of 5 years successful experience in the fabrication of structural steel framing components similar, in nature, to those required for this project. In addition, the fabricator shall have a quality control program acceptable to the Engineer.

C. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests within previous 12 months.

1. If recertification of welders is required, retesting will be Contractor's responsibility.

D. Special Inspection: The Owner will engage the services of a qualified “Special Inspector” for this project. The Special Inspector, as a representative of the Owner, will confirm that the provisions of Section 17 of the Connecticut State Building Code are complied with and will provide and/or supervise inspection and testing requirements, as necessary.

E. Steel fabricator shall be subject to Special Inspection requirements of the Building Code for fabrication plants and as defined in Part A and Part B below.

Part A Inspection – Verification of Capability and Quality Control: The Special Inspector will confirm that the structural steel fabricating plant has the personnel, organization, knowledge, experience, procedures, equipment, capability, and commitment to produce fabricated structural steel of the required quality of the category of structural steel work involved in the project. The basis of inspection will be the AISC manual “Quality Criteria and Inspection Standards”.

A structural steel fabricator that is Certified in Category II under the AISC Quality Certification Program may be exempted from Part A.

Part B Inspection – Verification of Implementation: The Special Inspector will confirm the implementation of the design by inspecting the fabrication of structural steel load bearing connections, members or assemblies in the shop to ensure conformance with the design plans, approved shop drawings and project specifications. Inspection shall consist of one or more of the following: Observation, interviews, testing, and/or examination of records.

F. The Special Inspector will inspect high-strength bolted connections and welded connections, perform tests, examine steel for straightness and alignment, fissures, mill scale, and other defects and deformities as described in ASTM A6, examine fabricated pieces for conformity with approved shop drawings including member sizes and prepare test reports as required.

Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

G. The Contractor shall furnish such facilities and provide such assistance as may be required for carrying out the inspection prescribed herein. He shall notify the inspection agency at least two weeks in advance of the start of any qualification testing or welding.

H. The Special Inspector will perform his duties, insofar as possible, in such a way that neither fabrication nor erection is unnecessarily delayed or impeded.

Field inspection will include examination of erected steel for welding, proper fitting, tensioning of bolts, alignment, trueness and plumbness.

I. Contractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Additional tests will be performed at contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

J. Shop bolted connections will be inspected in accordance with AISC specifications and "Specification for Structural Joints using ASTM A325 or A490 Bolts", Latest Edition.

K. Shop Welding will be inspected and tested during fabrication of structural steel assemblies, as follows:

1. Verify welder certification and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. The inspection agency will test shop welds as follows:

   All welds: 100% visual

   All moment connection full penetration welds: 20% (50% if fabricator is not certified by AISC) ultrasonic conforming to ASTM E164.

   a) Inspection level: If more than 10 percent of the welds are rejected then an additional 20 percent of the welds shall be tested. If 10 percent of these additional welds are found to be rejectable then an additional 20% of all full penetration welds will be tested. If 10 percent of this group is rejected then 100% of the welds will be tested.

L. Field bolted connections will be inspected to confirm compliance to Sections 2, 3 and 8 of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts". Observe calibration procedures for calibration devices used on the project and monitor the

installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is properly used to tighten all bolts.

1. Visually inspect all bolted connections to verify that connection is fully compacted.

2. Slip-Critical Connections and Connections Subject to Axial Tension:

   The installation and tightening of all slip-critical connections and connections subject to axial tension will be observed to assure that the specified procedure was followed to achieve the pretension specified in Table 4, AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts". All other slip-critical connections will be tested in conformance to AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

M. Field Welding will be inspected and tested during erection of structural steel as follows:

1. Verify welder certification and conduct inspection and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. The inspection agency will test field welds as follows:

   All welds: 100% visual.

   All moment connection full penetration welds: 100% ultrasonic conforming to ASTM E164.

N. For weld tests, reports by the Agency inspector will contain, as a minimum, an adequate description of each weld tested, the identifying mark of the welder responsible for the weld, a critique of statement regarding the acceptability of the weld tested, as judged by current A.W.S. Standards.

1.04 SUBMITTALS:

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. High-strength bolts (each type), including nuts and washers.

2. Shrinkage-resistant grout.

B. Shop Drawings: Submit shop drawings including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams.

Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Connections shall be designed for E70XX electrodes.

Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.

C. Calculations prepared and sealed by a Professional Engineer licensed in the State of Connecticut, for each connection including those for beams, columns, and braces.

D. Certificates of Compliance: Submit Certificates of Compliance for the following products to the Special Inspector:

1. High-strength bolts (each type), including nuts and washers.

Submit certificates of conformance for each fastener lot or portion of a lot supplied to the project. The certificate, issued by an acceptable laboratory, must confirm that random samples taken from the lot comply with the standards specified in the Contract Documents. Each certificate will contain, as a minimum; the lot number, a description of testing/inspection performed, a brief summary of the results and the date testing/inspection was completed.

2. Anchor bolts.

3. Headed Stud-Type anchors

4. Weld filler material

5. Galvanized materials; including steel sections, bolts, washers, nuts, etc.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay that work.

B. Store materials to permit easy access for inspection and identification. Keep steel members off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

C. For galvanized materials comply with ASTM A 123.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Structural Steel Shapes, Plates and Bars: ASTM A 36 or ASTM A 992, as indicated on the drawings.

C. Cold Formed Steel Tubing: ASTM A500, Grade B.

D. Material for galvanizing shall be geometrically suitable for galvanizing as specified in ASTM A 384 and A 385.

E. Anchor Bolts: ASTM A 307, nonheaded type unless otherwise indicated.

F. Unfinished Threaded Fasteners: ASTM A 307, Grade A regular low-carbon steel bolts and nuts.

1. Provide hexagonal heads and nuts for all connections.

G. High-Strength Threaded Fasteners: Heavy hexagon structural "tension control" bolts, heavy hexagon nuts, hardened washers as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A 325.

H. Headed Stud-Type Shear Connectors: ASTM A 108, Grade 1015 or 1020 cold finished carbon steel; with dimensions complying with AISC specifications.

I. Electrodes for Welding: Comply with AWS Code.

J. Non-Metallic Non-Shrink Grout: Premixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with ASTM C827, C109 and C191.

K. Structural Steel Primer Paint: SSPC - Paint 13.

L. Zinc for Galvanizing: ASTM B6 as specified in ASTM A123.

2.02 FABRICATION:

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.

Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

B. Connections: Weld or bolt shop connection, as indicated.

Bolt field connections with "tension control" bolts, except where welded or other connections are indicated.

1. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.

C. High-Strength Bolted Construction: Install high-strength, "tension control", threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts"

D. Headed stud anchors for composite construction shall be flux filled and welded in accordance with manufacturer's recommendations. Stud anchors shall be located and spaced as indicated on drawings.

E. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Assemble and weld built up sections by methods which will produce true alignment of axes without warp.

F. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.

Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

G. Web Penetrations: For structural steel beams and girders, web penetrations will be permitted for passage of other work, without prior approval of the Engineer, only if the maximum opening dimension does not exceed the lesser of 6" or .25d (d equals beam depth), if the penetration is located in the middle third of the beam span and if no concentrated load is located nearer than 2'-0" from the edge of the penetration. All other penetrations require prior approval by the Engineer.

Penetrations, not circular in nature, shall have a minimum radius of 1" at all corners and all edges of the penetration shall be provided with a reasonably even and smooth surface.

2.03 SHOP PAINTING:

A. General: Shop paint structural steel by providing one coat shop applied paint system complying with Steel Structures Painting Council (SSPC) Paint Systems Guide No. 7.00.

1. Do not paint surfaces which are to be welded or high strength bolted with friction type connections.

2. Steel which is designated to receive a field-applied contact-type fireproofing shall not be painted and shall be shop cleaned of loose mill scale, dirt, oil, and grease by appropriate means.

2.04 GALVANIZING:

A. Steel members, fabrications, and assemblies to be galvanized after fabrication, by hot dip process in accordance with ASTM A 123 or A 386, as applicable. Weight of zinc coating to conform to requirements specified under "Weight of Coating" in ASTM A 123 or ASTM A 386, as applicable.

B. Safeguard against steel embrittlement in conformance with ASTM A 143.

C. Safeguard against warpage or distortion of steel members to conform with ASTM A 384. Notify Architect/Engineer of potential warpage problems which may require modification in design, before proceeding with steel fabrications.

D. Finish and uniformity of zinc coating and adherence of coating to conform with ASTM A 123, A 153, or A 386, as applicable.

E. Bolts, nuts, and washers, and iron and steel hardware components to be galvanized in accordance with ASTM A 153. Weight of zinc coating to conform to requirements specified under "Weight of Coating" in ASTM A 153. Nuts to be tapped after galvanizing to minimum diametral amounts specified in ASTM A 563. Coat nuts with waterproof lubricant, clean and dry to touch. High strength bolts for structural steel joints to be galvanized in accordance with ASTM A 325.

PART 3 - EXECUTION:

3.01 INSPECTION:

A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor in writing of conditions detrimental to proper and timely completion of work.

3.02 ERECTION:

A. Surveys: Employ a registered land surveyor to establish permanent bench marks as shown and as necessary for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Engineer. Do not proceed with

erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Engineer.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide guy lines to achieve proper alignment of structures as erection proceeds.

C. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

D. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.

Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

1. Refer to Division 3 of these specifications for anchor bolt installation requirements in concrete, and Division 4 for masonry installation.

E. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

F. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

G. Pack non-shrink grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials and allow to cure.

1. For proprietary grout materials, comply with manufacturer's instructions.

H. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

Level and plumb individual members of structure within specified AISC tolerances. Adjust and weld in final position all structural steel angles which support architectural finish material. Adjustments are to be made to the tolerances of the applied finish materials.

Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

Splice members only where indicated and accepted on shop drawings.

I. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

J. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

K. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Engineer. Finish gas cut sections equal to a sheared appearance when permitted.

L. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas with same material as used for shop painting.

M. Touch-Up Galvanized Surfaces: Repair damaged galvanized surfaces in accordance with ASTM A 780. Dry film thickness of applied repair materials to be not less than galvanized coating thickness required by ASTM A 123, A 153, or A 386, as applicable. Touch up prime-painted surfaces with same galvanized primer applied in shop. Clean damaged surfaces first to assure proper paint adhesion.

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified in this section.

1.2 DESCRIPTION OF WORK

A. The extent of metal decking is shown on the drawings, including basic layout and type of deck units required.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise shown or specified:

1. American Iron and Steel Institute, AISI "Specification for the Design of Cold-Formed Steel Structural Members".

2. American Welding Society, AWS D1.3 "Specifications for Welding Sheet Steel in Structures".

3. Steel Deck Institute, SDI "Design Manual for Composite Decks, Form Decks and Roof Decks".

B. Qualifications of Filed Welding: Qualify welding processes and welding operators in accordance with AWS “Standard Qualification Procedure”.

C. Welded decking in place is subject to inspection and testing. Expense of removing and replacing portions of decking g for testing purposes shall be borne by Owner if welds are founds to be satisfactory. Work found to be defective will be removed and replaced with new acceptable work, at the expense of the Contractor.

D. Special Inspection: The Owner will engage the services of a qualified “Special Inspector” for this project. The Special Inspector, as a representative of the Owner, will confirm that the provisions of Section 17 of the Connecticut State Building Code are complied with and will provide and/or supervise inspection and testing requirements, as necessary.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.

B. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details, and conditions requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing or other accessories.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A 446, Grade A (Min Fy = 33 ksi)

B. Miscellaneous Steel Shapes: ASTM A 36.

C. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.

D. Galvanizing: ASTM A 525, Grade 60.

E. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL- P-21035 (Ships).

F. Paint: Manufacturer’s baked-on, rust-inhibitive paint, for application to metal surfaces which have been chemically cleaned and phosphate chemical treated.

2.2 FABRICATION

A. General: Form deck units in lengths to span 3 or more supports, with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated.

B. Metal Cover Plates: Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of duck units and approximately 6” wide.

C. Metal Closure Strips: Fabricate metal closure strips, for openings between decking and other construction, of not less than 0.045” min. (18 gage) sheet steel. Form to provide tight-fitting closures at top ends of cells or flutes and sides of decking.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine areas and conditions under which metal decking is to be installed and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.

Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

C. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

D. Do not use floor or roof deck units for storage or working platforms until permanently secured.

E. Fastening Deck Units:

Fasten roof deck units to steel supporting members by not less than 5/8” diameter fusion welds or elongated welds of equal strength, spaced not more than 12” o.c. at all supports. Lock side laps of adjacent units between supports by screwing or button punching at intervals not exceeding laps 36” o.c.

Tack weld or use machine screws at 4’-0” o.c. for fastening and closures.

F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.

G. Use welding Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

H. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

I. Hanger Slots or Clips: Provide UL approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.

Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots.

Locate slots or clips at not more than 14” o.c. in both directions, not over 9” from walls at ends, and not more than 12” from walls at sides, unless otherwise shown.

Provide manufacturer’s standard hanger attachment devices.

J. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units.

K. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking, and in voids between decking and other construction. Weld into position to provide a complete decking installation.

L. Touch-up Painting: After decking installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.

M. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.

END OF SECTION 05300

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Load-bearing wall framing.
2. Exterior non-load-bearing wall framing.
3. Interior non-load-bearing wall framing exceeding height limitations of standard, nonstructural metal framing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include layout, spacing's, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
3. For cold-formed metal framing indicated to comply with design loads, include structural analysis and **detailed shop drawings signed and sealed by a qualified professional engineer, who shall be licensed in the State of Connecticut and responsible for their preparation.**

C. Delegated-Design Submittal: For cold-formed steel framing.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Product Tests: Mill certificates or data from a qualified independent testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Clark Dietrich Building Systems.
2. MarinoWARE.

2.2 PERFORMANCE REQUIREMENTS

A. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:

1. Wall Studs: AISI S211.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:

1. Grade: As required by structural performance
2. Coating: G60.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

G. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

I. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

J. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches.

K. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

L. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

M. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.2 ERECTION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 054000

SECTION 057500 - DECORATIVE FORMED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Beam wraps.
2. Closures and trim.

B. Related Requirements:

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including finishing materials.

B. Shop Drawings: Show fabrication and installation details for decorative formed metal.

1. Include plans, elevations, component details, and attachment details.
2. Indicate materials and profiles of each decorative formed metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

C. Samples: For each type of exposed finish required, prepared on 6-inch square Samples of metal of same thickness and material indicated for the Work.

PART 2 - PRODUCTS

2.1 SHEET METAL

A. General: Fabricate products from sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

B. Aluminum Sheet: Flat sheet complying with ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties of not less than Alloy 5005-H32.

2.2 MISCELLANEOUS MATERIALS

A. Gaskets: As required to seal joints in decorative formed metal and remain weathertight; as recommended in writing by decorative formed metal manufacturer.

1. ASTM D 1056, Type 1, Class A, grade as recommended by gasket manufacturer to obtain seal for application indicated.
2. Closed-cell polyurethane foam, adhesive on two sides, release paper protected.

B. Sealants, Exterior: Elastomeric sealant complying with Section 079200 "Joint Sealants" and as recommended in writing by decorative formed metal manufacturer.

C. Filler Metal and Electrodes: Provide type and alloy of filler metal and electrodes as necessary for strength, corrosion resistance, and compatibility in fabricated items.

1. Use filler metals that will match the color of metal being joined.

D. Fasteners: Fabricated from same basic metal and alloy as fastened metal unless otherwise indicated.

1. Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

E. Anchors: Provide fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193

F. Laminating Adhesive: Adhesive recommended by metal fabricator that will fully bond metal to metal and is noncombustible after curing.

G. Isolation Coating: Manufacturer's standard bituminous paint.

2.3 FABRICATION, GENERAL

A. Shop Assembly: Preassemble decorative formed metal items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch- wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch and support with concealed stiffeners.

C. Increase metal thickness or reinforce with concealed stiffeners, backing materials, or both, as needed to provide surface flatness and sufficient strength for indicated use.

1. Support joints with concealed stiffeners as needed to hold exposed faces of adjoining sheets in flush alignment.

D. Where welding or brazing is indicated, weld or braze joints and seams continuously. Grind, fill, and dress to produce smooth, flush, exposed surfaces in which joints are not visible after finishing is completed.

2.4 BEAM WRAPS

A. Form beam wraps from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction.

1. Aluminum Sheet: 0.063 inch

a. Finish: High-performance organic coating

2.5 CLOSURES AND TRIM

A. Form closures and trim from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction**,** with weathertight joints at exterior installations.

1. Aluminum Sheet: 0.063 inch.

a. Finish: High-performance organic coating.

2.6 ALUMINUM FINISHES

A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: Match Architect's sample

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate and place decorative formed metal items level and plumb and in alignment with adjacent construction. Perform cutting, drilling, and fitting required to install decorative formed metal.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where needed to protect metal surfaces and to make a weathertight connection.

C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers as indicated.

D. Corrosion Protection: Apply bituminous paint or other permanent separation materials on concealed surfaces where metals would otherwise be in direct contact with substrate materials that are incompatible or could result in corrosion or deterioration of either material or finish.

E. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION 057500

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Rooftop equipment bases and support curbs.
2. Wood blocking, cants, and nailers, curbs, equipment support bases, blocking, stripping, and similar members.
3. Wood sills, sleepers, blocking, and similar concealed members
4. Plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

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, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, AND Use Category UC3b for exterior construction not in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that 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.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

D. Application: Treat items indicated on Drawings, and the following**:**

1. Concealed blocking.
2. Roof construction.

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.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species complying with PS 20.

C. Concealed Boards: Construction or No. 2 grade lumber of any species complying with PS 20 with a 15 percent maximum moisture content.

2.5 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall 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 of Type 304 stainless steel.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.6 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

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 accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

C. Sort and select lumber so that natural characteristics do 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.

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

F. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
2. ICC-ES evaluation report for fastener.

3.2 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.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing
2. Sheathing joint and penetration treatment

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.

1.4 QUALITY ASSURANCE

A. Source: For each material type required for the work of this section, provide primary materials which are the product of one manufacturer. Provide secondary or accessory materials which are acceptable to the manufacturers of the primary materials.

PART 2 - PRODUCTS

2.1 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.2 WALL SHEATHING

A. Plywood Sheathing: DOC PS 1, Exterior sheathing.

B. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M. with glass mats both sides and long edges, water-resistant treated core or ASTM C 1278 with water resistant core; face and back surface water resistant coatings:

1. Manufacturer: Dens-Glass Gold Sheathing by G-P Gypsum Corporation or Fiberock Brand Sheathing by USG.
2. Thickness: 1/2 inches thick.
3. Fire Resistance: ASTM E 136, non-combustible; ASTM E 84, flame spread 0, smoke developed 0.
4. Fasteners for Metal Framing: Type S, Bugle head, rust-resistant sharp point.

2.3 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."

B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

2.4 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Coordinate wall parapet and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.
1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

END OF SECTION 061600

SECTION 062023 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior trim.

B. Related Requirements:

1. Section 099100 " Painting" for priming and backpriming of interior finish carpentry.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 WOOD TRIM FABRICATORS

A. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Garden State Lumber
2. Ring’s End Lumber

2.2 WOOD TRIM, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.

2.3 INTERIOR TRIM

A. Moldings for Opaque Finish (Painted Finish): Made to patterns included in MMPA's "WM/Series Wood Moulding Patterns."

1. Hardwood Moldings: MMPA HWM 4, P-grade.

a. Species: yellow poplar
b. Maximum Moisture Content: 9 percent.

2. Optional Material: Primed MDF.
3. Finger Jointing: Allowed.

B. Molding Patterns:

1. Wood Base, Type 1. Garden State Lumber, BB514, 9/16” x 5 1/4”
2. Wood Trim, Type 2. Garden State Lumber, LK4, 1 1/8” x 4”
3. Wood Trim, Type 3. Garden State Lumber, BB712, 9/16” x 3 1/4”
4. Wood Trim, Type 4. Garden State Lumber, LWM49, 9/16” x 3 5/8”

2.4 MISCELLANEOUS MATERIALS

A. Adhesives: Do not use adhesives that contain urea formaldehyde.

B. VOC Limits for Installation Adhesives and Sealants: Use products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Wood Glues: 30 g/L.
2. Multipurpose Construction Adhesives: 70 g/L.

2.5 SHOP PRIMING

A. Interior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 09 91 23 "Interior Painting."

B. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours, unless longer conditioning is recommended by manufacturer.

3.2 INSTALLATION, GENERAL

A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.

3.3 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

1. Fill gaps, if any, between top of base and wall with latex sealant, painted to match wall.
2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.

B. Clean wood trim on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 062023

SECTION 066000 – CELLULAR PVC FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cellular PVC fabrications including the following:
   a. Exterior Trim
   b. Exterior Moldings

1.2 ACTION SUBMITTALS

A. 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.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples: Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.3 REFERENCES

A. ASTM International (ASTM): ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with requirements of authorities having jurisdiction and applicable codes at the location of the project.

B. Manufacturer Qualifications: Minimum 5 years’ experience manufacturing similar products.

C. Installer Qualifications: Minimum 2 years’ experience installing similar products.

1.5 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. Comply with manufacturer's recommendations. Handle materials to avoid damage.

1.6 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.

B. Comply with manufacturer's recommendations. Handle materials to avoid damage.

1.7 WARRANTY

A. Provide manufacturer's standard limited warranty for products, stating that components will be free from defects in material that occur as a direct result of the manufacturing process, occur under normal use and service, occur during the warranty period and result in blistering, peeling, flaking, cracking, splitting, cupping, rotting or structural defects from termites or fungal decay.
1. Azek Trim Warranty Period: 25 years.
2. Azek Moulding Warranty Period: 25 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Azek Building Products, Inc., or equal

2.2 TRIM

A. Fire Performance Characteristics: Provide products complying with the following:
1. Flame Spread Index: Less than 25, ASTM E 84.

B. PVC Trim: Material shall have the following characteristics:
1. Material: Solid Cellular PVC.
2. Style: Traditional.
a. 5/8 inches x 11-1/4 inches
3. Trim Size, 6/4 Thickness:
a. 6/4 x 4, 1-1/4 inches x 3-1/2 inches

C. Column Wrap: Composed of three connected panels and a fourth panel that locks into place to form a tight and secure enclosure. Material shall have the following characteristics:
1. Material: Smooth finish Solid Cellular PVC.
2. Color, White
3. Style: Traditional.
4. Column Wrap Size (Inner Dimensions):
a. 8 x 8 x 10 feet nominal, 7-3/4 inches x 7-3/4 inches by 10 feet actual dimension.

2.3 MOULDINGS

A. Detail Profiles: Material shall have the following characteristics:
   1. Material: Smooth Finish Solid Cellular PVC.
   2. Color, White
   3. Detail Profile:
      a. Historic Sill, Exterior Trim, Type 1, 1-3/4 inches x 2 1/32 inches, AZM-6930.
      b. Quarter Round, Exterior Trim, Type 2, 3/4 inches x ¾ inches, AZM-105.

B. Casing Profiles: Material shall have the following characteristics:
   1. Material: Smooth Finish Solid Cellular PVC.
   2. Color, White
   3. Casing Profile:
      a. Colonial Base Cap, Exterior Trim, Type 4, 3/4 inches x 5 1/4 inches, AZM-163.
      b. Shingle Mould, Exterior Trim, Type 3, 11/16 inches x 5/8 inches, AZM-210.

2.4 ACCESSORIES

A. Fasteners: Stainless steel or hot-dip galvanized, with thin shank, blunt point, full round head as recommended by the manufacturer.

B. Adhesives: Azek Adhesive, a non-toxic, odorless, UV stable, water-based PVC cement.

C. Sealants: Urethane, polyurethane or acrylic based sealants without silicone.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions that may be detrimental to proper or timely completion.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install products in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   1. Use manufacturers recommended fasteners, not more than 2 inches from ends.
   2. Glue joints to eliminate joint separation.
   3. Allow for expansion and contraction at ends of the runs.

3.3 CLEANING AND PROTECTION

A. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.

B. Clean products, prior to Substantial Completion, using materials recommended by the manufacturer to remove stains, dirt and debris prior to final acceptance.

END OF SECTION 066000

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board.
2. Glass-fiber blanket.
3. Mineral-wool blanket.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

A. Extruded polystyrene boards in this article are also called "XPS boards."

B. Extruded Polystyrene Board at Cavity Walls, Type X: ASTM C 578, Type X, 15-psi (104-kPa) minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Dow Chemical Company (The).
b. Owens Corning.

C. Extruded Polystyrene Board, Type IV at Foundation Walls: ASTM C 578, Type IV, 25-psi (173-kPa) minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Dow Chemical Company (The).
b. Owens Corning.

2.2 GLASS-FIBER BLANKET

A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. CertainTeed Corporation.
    b. Johns Manville; a Berkshire Hathaway company.
    c. Owens Corning.

2.3 MINERAL-WOOL BLANKETS

A. Mineral-Wool Blanket, Unfaced: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. ROXUL.
    b. Thermafiber, Inc.; an Owens Corning company.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.

C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb. /cu. ft. (40 kg/cu. m).
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 072210 – ROOF INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2 SUMMARY

A. Section Includes:

1. This portion of the specification describes materials and workmanship required for the installation of insulation over Gypsum decks.
2. All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.
3. Roof Areas covered under this section: Designated Low Slope Area
4. Cutting and Patching of Upper existing Main Roof to accommodate mew Mechanical unit on upper roof to maintain roof warrantee.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Insulation shall be delivered to the site in an undamaged and dry condition. Material received that is not dry or is otherwise damaged shall be rejected.

B. Proper storage on or off the site shall be the responsibility of the roofing contractor.

C. Any unused insulation remaining on the roof at the end of the workday shall be returned to storage.

1.4 INSULATION - GENERAL

A. All insulation materials must be approved by the warrantor of primary roof membrane materials. Samples should be provided to the manufacturer and written approval from the warrantor of primary roof membrane materials is required before ordering these materials for the project.

B. Insulation boards shall be full size except when cutting is required at roof edges and openings. Boards that are broken, cracked, have been exposed to moisture, or are otherwise damaged shall not be used.

C. The proper installation and fit of wood nailers, blocking, and other rough carpentry in appropriate locations shall be verified prior to installation of roof insulation.

D. Caution shall be exercised with construction traffic to avoid damage to new insulation. Breaking or crushing of insulation is unacceptable and any damaged insulation shall be replaced at the roofing contractor's expense.

E. Insulation shall be laid with end joints staggered and all joints tight; however, boards shall not be forced into place.

F. No more insulation shall be installed during any work period than can be covered by all plies of roofing during the same work period. At the end of the work period, temporary edge seals shall be installed to protect the roof insulation. Upon resumption of work, they must be removed. Such seals shall consist of strips of roofing felt applied and top coated with specified interply adhesive.

G. Insulation surfaces shall be cleared of all debris before roofing is placed.

H. All precautions should be made to prevent bitumen drippage during and after application of insulation and roofing materials.

PART 2 - PRODUCTS

2.1 INSULATION

A. Submittals/Shop Drawings: Provide Shop drawing of entire roof insulation layout including tapered insulation, cants, crickets roof penetrations, etc indicating overall roof performance r value of 39 minimum.

B. Insulation Types:

1 First Layer: Polyisocyanurate 4"

2 Second Layer: Wood Fiber 1/2" coverboard

3 Tapered edge strip: ASTM C728-82, perlite. tapered from 1-5/8 inch to 1/8 inch (on twelve inch dimension), size 12 x 48 inches or as approved by the system warrantor's representative

4 Cants: ASTM C728-82, perlite.

5 Crickets: ASTM C728-82, perlite, factory fabricated, 1/2 inch slope, 2 x 4 feet dimension.

C. Insulation Adhesives and Fasteners:

1 Cold Adhesive:
Insta-Stik, Insta-Foam Products, Joliet, IL

2 Hot Adhesive:
Not Specified

3 Fasteners:

a Not Specified

PART 3 - EXECUTION

3.1 CONDITION OF DECK

A. Prior to installing insulation, deck must be inspected and accepted by the roofing contractor. Contractor must verify deck slopes and determine if insulation stops and/or backnailing is required by the warranty supplier based on the system being installed. All deficiencies must be corrected prior to start of work.

B. The roofing contractor shall perform all other work of preparing the deck. When insulation is applied, the deck shall be dry and free of dew, frost, ice, and snow.

C. The roofing contractor shall notify the building owner's representative of any improper installations.

3.2 THERMAL INSULATION

A. First Layer:

1 Mechanically attach according to cold adhesive manufacturer’s recommended procedures and specifications.

B. Second Layer:

1 Adhere insulation according to cold adhesive manufacturer’s recommended procedures and specifications.

C. Insulation installation requirements:

1 Stagger joints at least six inches.

2 Install insulation boards in courses parallel to roof edges.

3 Firmly butt each insulation board to surrounding boards. Do not jam or deform boards.

4 Maximum elevation variation between boards at joints: 1/8 inch.

D. Cut and fit insulation boards where roof deck intersects vertical surfaces. Cut board 1/4 inch from vertical surface.

1 All boards installed shall be 18 inches in length or width, minimum.

2 Promptly spread any adhesive that may accumulate on insulation surface to achieve smooth surface for roofing installation.

3.3 TAPERED EDGE INSTALLATION

A. Tapered edge strips shall be adhered with the specified insulation adhesive.

B. Tapered edge strips are to be installed around all drains to form a continuous 48-inch square sump.

C. Tapered edge strips shall be used at perimeter roof edge where nailer and gravel stop is raised.

3.4 CANTS

A. Cant strips shall be installed at all 90-degree angles where the horizontal installation of insulation meets the vertical sides of roof penetrations and walls. Cants must be installed prior to application of membrane and flashings.

END OF SECTION 072210

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vapor-retarding, fluid-applied air barriers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For air-barrier assemblies.

1. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

2.2 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING

A. High-Build, Vapor-Retarding Air Barrier: Modified bituminous or synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.

1. Modified Bituminous Type:

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Carlisle Coatings & Waterproofing Inc.
2) Henry Company.
3) Tremco Incorporated.
4) W. R. Meadows, Inc.

2. Synthetic Polymer Type:

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1) Carlisle Coatings & Waterproofing Inc.
2) GCP Applied Technologies Inc. (formerly Grace Construction Products).
3) Henry Company.
4) W. R. Meadows, Inc.

3. Physical and Performance Properties:

a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
b. Vapor Permeance: Maximum 0.1 perm; ASTM E 96/E 96M, Desiccant Method.
c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.
d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.3 ACCESSORY MATERIALS

A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

D. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

3.2 INSTALLATION

A. Install materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.

D. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

E. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.

1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.

F. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.3 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

B. Remove masking materials after installation.

END OF SECTION 072726

SECTION 075110 – COLD APPLIED BITUMINUOUS ROOFING SPECFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2 GENERAL

A. Section Includes:

1 This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the specified roofing system.
2 Follow Membrane manufacturers guidelines
3 Roofing contractor shall furnish and install all materials described herein unless specifically noted otherwise.
4 This section is for work on roofs: Designated Low Slope Area

5. Cutting and Patching of Upper existing Main Roof to accommodate mew Mechanical unit on upper roof to maintain roof warrantee.

1.3 INSPECTION

A. Roofing contractor shall verify installation conditions as satisfactory to receive work, including deck slope which may require insulation stops and/or backnailing by the warranty supplier based on specified system.

B. The roofing contractor shall notify building owner, in writing of any defects in the substrate, and work shall not proceed until defects have been corrected.

C. Do not install new roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.

D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

E. Start of work by the roofing contractor shall imply approval of deck surfaces and site conditions; and no claim in this respect will be considered valid in case of failure of the roofing components within the guarantee period.

F. Roofing contractor shall verify that work of other trades penetrating roof deck or requiring workers and equipment to transverse roof deck has been approved by owner, roofing system warrantor, and roofing contractor.

1.4 SCHEDULE

A. Installation of the new roofing system should be scheduled after all other major rooftop construction is complete to minimize potential for damage to the new roofing system by others.

1.5 QUALITY ASSURANCE

A. The roofing and associated work shall be contracted to a single firm, called the roofing contractor hereafter, specializing in the type of roofing required, so that there will be undivided responsibility for the performance of the work.

1.6 PRE-ROOFING CONFERENCE

A. A pre-roofing conference shall be held at the project site in advance of the time scheduled for roofing work. The purpose of this conference is to review requirements for the work and conditions that could possibly interfere with successful performance of the work. This conference shall review existing conditions and deck surfaces, roof insulation, roofing, flashing, and any other items related to the roof system. Every party who is concerned with the work, or required to coordinate with it or to protect it thereafter, should attend this conference, including the authorized representative of building owner, the roofing system warrantor, and the roofing contractor. A record of all decisions and agreements made at this meeting, as well as a list of attendees shall be recorded for the job record. The building owner's representative is responsible for this documentation and shall initiate and chair this meeting.

1.7 SUBMITTALS

A. Related section: SECTION 013300 - SUBMITTALS

B. Prior to starting work, the roofing contractor shall submit 3 copies of the technical data on roofing materials, including material specifications, Material Safety Data Sheets, and installation procedures.

1.8 JOB CONDITIONS

A. Roofing work shall proceed only when weather conditions will permit the work to proceed in accordance with the roofing system warrantor’s recommendations.

1.9 FIRE AND SMOKE PROTECTION

A. Kettles shall be located so as to prevent damage to buildings or other property. They shall not be positioned on roof decks. Mops shall be spun at the end of work periods to separate the strands, and shall be stored in that conditions to prevent spontaneous combustion. Fire extinguishers shall be provided near kettles for immediate use.

1.10 SAFETY PRECAUTIONS

A. All owner's and OSHA safety rules shall be adhered to in the execution of this work. The fumes of hot bituminous materials may be toxic to some workers. Adequate protection shall be provided, to prevent burns and skin irritation, in accordance with building owner safety requirements.

1.11 ROOF TRAFFIC

A. After work on roof is started, no traffic will be permitted on the roof other than that necessary for the roofing application and inspection. Materials shall not be piled on the roof to the extent that design live loads are exceeded. Roofing materials shall not be transported over unfinished or finished roofing or existing roofs unless adequate protection is provided.

B. Any damage to existing roofs shall be repaired as directed by building owner at no expense to building owner.

1.12 PROTECTION AGAINST SOILAGE

A. Surface of walls, walks, pavements, adjacent property, etc., shall be protected as necessary to prevent soiling or other damage resulting from the application of roofing or transporting of materials. If surfaces are stained or damaged in any way, they shall be restored by this contractor, at no cost to building owner, in a manner acceptable to building owner.

B. Felt envelopes shall be installed where required to prevent bitumen drippage. Follow NRCA guidelines for felt enveloping techniques.

1.13 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the site in an undamaged and dry condition.

B. Material received which is not dry or is otherwise damaged shall be rejected. Storage should be either in a heated building or in a warehouse or similar type structure at ambient temperature and humidity. Conditions should be such that the moisture content of felts at time of use does not exceed the equilibrium moisture content (EMC) at 75% RH.

C. Rolls of flashing and felts shall be stacked on their ends and never in contact with the ground. Bituminous emulsions shall be stored at temperatures above freezing.

D. Proper storage on or off the site shall be the responsibility of the roofing contractor.

E. Any unused roofing felt remaining on the roof at the end of the workday shall be returned to storage.

1.14 WORK SEQUENCE

A. Once work is started on a roof or section, it shall continue without undue delay until that section is completed before starting another. The installation of flashings shall follow application of the roofing immediately.

1.15 FINAL INSPECTION

A. Upon completion of the installation, an inspection shall be made by a representative of building owner to ascertain that the roofing system has been installed according to the roofing system published specifications and details. The warranty will be issued upon warrantor's approval of the installation and payment for all materials and fees.

1.16 ADJUSTMENT AND REPAIR

A. Any roofing damaged or misapplication shall be repaired or replaced as designated by the building owner and roofing system warrantor. Repairs or replacement will be made by the contractor at no expense to building owner.

1.17 ROOFING WARRANTY

A. Upon project completion, acceptance by building owner and warrantor, and payment of all materials and fees, the specified warranty will be issued.

PART 2 - PRODUCTS

2.1 GENERAL

A. Comply with Quality Control, References, Specification, and Manufacturer's data. Where conflict may exist, requirements that are more stringent govern.

B. Provide primary products, including each type of roofing sheet (felt), bitumen, base flashings, miscellaneous flashing materials, and sheet metal components from a supplier/manufacturer, which has produced that type of product successfully for not less than three (3) years. Provide secondary products (insulation, mechanical fasteners, lumber, and etc.) only as recommended by the warrantor of primary products for use with roofing system specified.

2.2 MULTI-PLY ROOFING MATERIALS

A. Sheet Materials

1 Base Sheet:
Not Specified

2 Ply Sheets:

Test	Typical Value	Test Method
Breaking Strength	90 lbf/in. MD 75 lbf/in. XMD	ASTM D 4601
Pliability 1/2" Radius	Pass	ASTM D 4601
Mass of Desaturated Felt	1.9 lb/100 ft^2	ASTM D 4601
Surfacing and Stabilizer	13 lb/100 ft^2	ASTM D 4601

Asphalt	18 lb/100 ft^2	ASTM D 4601
Moisture	0%	ASTM D 4601
Asbestos	0%	EPA 600/R-93/116
Fire Resistance	Pass, Class A	ASTM E 108 / UL 790
Weight	33 lb/100 ft^2	ASTM D 4601
Thickness	65 mils	ASTM D 146
Ash	76%	ASTM D 4601

3 Cap Sheet:

Test	Typical Value	Test Method
Thickness, mils (mm)	160 (4.0)	ASTM D 5147 / D 6162
Maximum Load, 73.4 ± 3.6°F (23 ± 2°C), lbf/in (kN/m)	589 (103.1) MD 449 (78.6) XMD	ASTM D 5147 / D 6162
Elongation at Maximum Load, 73.4 ± 3.6°F (23 ± 2°C), %	22% MD 18% XMD	ASTM D 5147 / D 6162
Tear Strength at 73.4 ± 3.6°F (23 ± 2°C), lbf (N)	866 (3,854) MD 640 (2,848) XMD	ASTM D 5147 / D 6162
Tensile Strength at 0°F ± 3.6°F (-18 ± 2°C), lbf/in.	811 (142.0) MD 468 (81.96) XMD	ASTM D 5147 / D 6162
Low Temperature Elongation at Max. Load, 0°F ± 3.6°F (-18 ± 2°C), %	10% MD 7% XMD	ASTM D 5147 / D 6162
Dimensional Stability, %	0.5	ASTM D 5147 / D 6162
Compound Stability, °F (°C)	230 (110)	ASTM D 5147 / D 6162
Granule Embedment (Grams Loss)	< 1.5 (Actual)	ASTM D 5147 / D 6162
Net Mass per Unit Area, lb/100 ft. (g/m^2)	110 (5,370)	ASTM D 5147 / D 6162
Asbestos	Zero	EPA 600/R-93/116
Fire Resistance	Pass, Class A	UL 790 / ASTM E 108

B. Coatings and Adhesives:

1 Base Sheet Adhesive:

N/A

2 Interply Adhesive:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Uniformity	Pass	ASTM D 4479
Asphalt Content	49%	ASTM D 4
Solids by Weight	75%	ASTM D 4479
Density	8.5 lbs/gal.	ASTM D 1475
Viscosity @ 77°F	17,000 – 40,000 cps	ASTM D 2196
Flash Point	101°F minimum	ASTM D 93
Fire Resistance	Pass	ASTM E 108/UL 790
Rubber Modifier	SEBS Fourier Transform-Infrared Spectroscopy	

3 Cap Sheet Adhesive:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Uniformity	Pass	ASTM D 4479

Asphalt Content	49%	ASTM D 4
Solids by Weight	75%	ASTM D 4479
Density	8.5 lbs/gal.	ASTM D 1475
Viscosity @ 77°F	17,000 – 40,000 cps	ASTM D 2196
Flash Point	101°F minimum	ASTM D 93
Fire Resistance	Pass	ASTM E 108/UL 790
Rubber Modifier	SEBS Fourier Transform-Infrared Spectroscopy	

4 Flood Coat/Protective Coating:
N/A

5 Reflective Surfacing:
N/A

C. Related Membrane Roofing System Materials

1 Base Sheet Fasteners:
Not Specified

2 Asphalt Primer:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Viscosity	100-200 cps	ASTM D 2196
Density	7.2 lbs/gal.	ASTM D 1475
Solids by Weight	43%	ASTM D 4479
Flash Point	101ºF minimum	ASTM D 93

3 Asphalt Mastic:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Non-Volatile Matter by Weight	76-82%	ASTM D 4586
Viscosity @ 77°F	450,000 - 950,000 cps	ASTM D 2196
Density @ 77°F	9.5 - 10.0 lb/gal.	ASTM D 1475
Resistance to Sag @ 140°F	1/8" maximum	ASTM D 4586
Adhesion to Wet Surfaces	55%	ASTM D 3409
Moisture by Weight	1.5%	ASTM D 4586
Mineral or Other Stabilizers by Wt	38%	ASTM D 4586
Asphalt by Weight	40%	ASTM D 4586
Uniformity & Workability	Acceptable as described	ASTM D 4586
Behavior @ 140°F	No blistering	ASTM D 4586
Pliability @ 32°F	No cracking/separation	ASTM D 45

4 Roofing aggregate:
Not Specified

PART 3 - EXECUTION

3.1 MEMBRANE

A. Base Sheet Installation:
1. Not Specified

B. Membrane Installation:
   1. Two plies of specified sheet shall be embedded into fluid, continuous applications of specified adhesive. The starter sheets and plies shall begin at the starting/low point of the roof and run parallel to the ridge or high point of roof.
   2. Starter sheets shall be installed to maintain a minimum 2” side lap and there shall be a minimum of two plies at all locations. Starter strips shall be installed according to NRCA guidelines.
   3. Adhesive shall be applied at a rate of 2.5-3 gallons per 100 square feet. A Warm Master unit may be used to facilitate spray capabilities in order to provide a more uniform application.

C. Cap Sheet Installation:
   1. Starting at the lowest point on roof, apply adhesive from outside edge or lowest point up onto roof at least width of roll, at the rate of 3 gals / 100 sq. ft.
   2. Immediately roll out a full width of Specified Cap Sheet into wet adhesive, carefully aligning roll with edge of roof.
   3. Starting at the one ply line apply adhesive out onto substrate at the rate of 3 gals. / 100 sq. ft. up onto roof at least width of roll.
   4. Immediately roll out a full width of Specified Cap Sheet into wet adhesive, carefully aligning roll with one ply line. Follow manufacturers guidelines for backnailing on up slope side.
   5. Repeat steps 3 & 4 until reaching the crest of roof.

D. Membrane installation further requirements:
   1. Follow warranty supplier's recommendations for backnailing requirements.
   2. Place ply sheets to ensure water will flow over or parallel to, but never against, exposed edges.
   3. When using adhesives, ply should never touch ply even at roof edges, laps, tapered edge strips, and cants.
   4. Apply specified adhesive no more than ten feet ahead of each roll being embedded, less in cool weather.
   5. Avoid excessive application of adhesive over top ply, leave top ply exposed with minimal adhesive at ply lines or back-line on the insulation.
   6. Light brooming or squeegeeing may be required to aid adhesion of ply sheets, base sheets, and/or cap sheets.
   7. Avoid traffic on all newly installed membrane.
   8. Overlap previous day's work 24 inches.
   9. Lap ply sheet ends six inches. Stagger end laps twelve inches minimum.
   10. Fit plies into roof drain rims, install metal flashing and finishing plies, secure clamping collars, and install domes.
   11. Cut out fishmouths/side laps that are not completely sealed. Replace all sheets that are not fully and continuously bonded.
   12. Roof is to be inspected and approved by representative from roof system warrantor before application of surfacing.

3.2 DAILY WATERSOP/TIE/INS

A. Install "deadman" insulation filler at insulation staggers.

B. Extend roofing plies at least twelve inches onto prepared area of adjacent roofing. Embed plies into Specified Interply Adhesive. Strip edges with twelve-inch wide ply sheet embedded completely in alternate uniform courses of Specified Interply Adhesive.

C. At beginning of next day's work, remove temporary connection by cutting felts evenly along edge of existing roof system. Remove "deadman" insulation fillers.

3.3 ADJUSTING AND CLEANING

A. Repair of Deficiencies: Installations or details noted as deficient during inspections must be repaired and corrected by applicator, and made ready for reinspection within five working days.

B. Clean up: Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.

END OF SECTION 075110

SECTION 076510 – FLEXIBLE FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2 GENERAL

A. Section Includes:

1 This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the flashings and sheet metal on the roofing systems specified.
2 All materials described herein shall be furnished and installed by the roofing contractor unless specifically noted otherwise.
3 This section is for work on roofs: Designated Low Slope Area
4 Any shop formed metal work shall be in accordance with Architectural Sheet Metal Manual, latest edition, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

PART 2 - PRODUCTS

2.1 MECHANICAL FASTENERS

A. Sheet Metal to Masonry
1 Tapcon 1/4 inch diameter, Phillips flat head anchor with EPDM washer by Buildex Div. of ITW, Itasca, IL.
2 Length: Sufficient to provide 1-1/4 inch embedment.

B. Sheet Metal to Curbs

1 Fab-lok Fac 10-8 stainless steel screw, aluminum sleeve by Textron Fastening Systems, Providence, RI.

C. Stainless sheet steel to wood blocking:
1 Roofing nails: galvanized steel wire, flat head, diamond point, round, barbed shank.
2 Length: Sufficient to penetrate wood blocking 1-1/4 inches minimum.

D. Galvanized sheet steel to wood blocking:
1 Roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.
2 Length: Sufficient to penetrate wood blocking 1-1/4 inches minimum.

E. Base Flashing to Masonry
   1 Masonry nail by Simplex Nail, Inc., Americus, GA.
   2 King-Con Concrete & Masonry Wall Anchor with Plate by ITW Buildex, Itasca, IL.

2.2 METAL FLASHINGS

A. Plumbing vents:

   1 Prefabricated plumbing vent flashings, 4 lb lead

B. Pitch pan and bonnets:

   1 Aluminum: ASTM B209, .040 inch thick mill finish

C. Reglet sealant:

Test	Typical Value	Test Method
Rheological (sag in vertical displacement at 120°F (49°C)	No sag	ASTM C 639
Extrusion Rate	2 seconds	ASTM C 603
Hardness Properties (Shore A)	25 ± 5	ASTM D 2240
Movement Capability	± 25%	ASTM C 719
Weight Loss, After Heat Aging	9%	ASTM C 792
Cracking and Chalking, After Heat Loss	None	ASTM C 792
Stain and Color Change	Passes (no visible stain)	ASTM C 519
Tack-Free Time at 77°F (25°C), 50% R.H.	16 – 24 hours	Fed. Spec. TT-S-230c
Cure Time at 77°F (25°C), 50 R.H.	4 – 7 days	Observed
Tensile Strength at 77°F (25°C)	250 psi	ASTM D 412
% Elongation	500%	ASTM D 412
Accelerated Aging	No physical damage	ASTM C 793
Asbestos Content	0%	EPA 600/R-93/116

D. Wall Counterflashing Systems:

   1 16 oz. Copper

E. Gravel stop, bitumen stops and fascia systems: Shop fabricated metal components per SMACNA standards approved by the roofing manufacturer.

   1 .040" Mill Finish Aluminum

F. Coping and Area divider covers: Shop fabricated metal components per SMACNA standards approved by the roofing manufacturer. Joint type shall be J-7, J-8, J-9 or J-12

   1 .040" Kynar 500 Coated Aluminum

G. Expansion joint covers: Shop fabricated metal components per SMACNA standards approved by the roofing manufacturer. Joint type shall be J-7, J-8, J-9 or J-12

   1 N/A

2.3 FLEXIBLE FLASHINGS

A. Flashing ply sheet:

1 Flashing Base Ply Felt:

Test	Typical Value	Test Method
Breaking Strength	90 lbf/in. MD 75 lbf/in. XMD	ASTM D 4601
Pliability 1/2" Radius	Pass	ASTM D 4601
Mass of Desaturated Felt	1.9 lb/100 ft^2	ASTM D 4601
Surfacing and Stabilizer	13 lb/100 ft^2	ASTM D 4601
Asphalt	18 lb/100 ft^2	ASTM D 4601
Moisture	0%	ASTM D 4601
Asbestos	0%	EPA 600/R-93/116
Fire Resistance	Pass, Class A	ASTM E 108 / UL 790
Weight	33 lb/100 ft^2	ASTM D 4601
Thickness	65 mils	ASTM D 146
Ash	76%	ASTM D 4601

2 Flashing Top Ply:

Test	Typical Value	Test Method
Thickness, mils (mm)	160 (4.0)	ASTM D 5147 / D 6162
Maximum Load, 73.4 ± 3.6°F (23 ± 2°C), lbf/in (kN/m)	589 (103.1) MD 449 (78.6) XMD	ASTM D 5147 / D 6162
Elongation at Maximum Load, 73.4 ± 3.6°F (23 ± 2°C), %	22% MD 18% XMD	ASTM D 5147 / D 6162
Tear Strength at 73.4 ± 3.6°F (23 ± 2°C), lbf (N)	866 (3,854) MD 640 (2,848) XMD	ASTM D 5147 / D 6162
Tensile Strength at 0°F ± 3.6°F (-18 ±2°C), lbf/in.	811 (142.0) MD 468 (81.96) XMD	ASTM D 5147 / D 6162
Low Temperature Elongation at Max. Load, 0°F ± 3.6°F (-18 ± 2°C), %	10% MD 7% XMD	ASTM D 5147 / D 6162
Dimensional Stability, %	0.5	ASTM D 5147 / D 6162
Compound Stability, °F (°C)	230 (110)	ASTM D 5147 / D 6162
Granule Embedment (Grams Loss)	< 1.5 (Actual)	ASTM D 5147 / D 6162
Net Mass per Unit Area, lb/100 ft. (g/m^2)	110 (5,370)	ASTM D 5147 / D 6162
Asbestos	Zero	EPA 600/R-93/116
Fire Resistance	Pass, Class A	UL 790 / ASTM E 108

B. Adhesives and coatings:

1 Flashing adhesive:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Non-Volatile Matter by Weight	76-82%	ASTM D 4586
Viscosity @ 77°F	450,000 - 950,000 cps	ASTM D 2196
Density @ 77°F	9.5 - 10.0 lb/gal.	ASTM D 1475
Resistance to Sag @ 140°F	1/8" maximum	ASTM D 4586

Adhesion to Wet Surfaces	55%	ASTM D 3409
Moisture by Weight	1.5%	ASTM D 4586
Mineral or Other Stabilizers by WT.	38%	ASTM D 4586
Asphalt by Weight	40%	ASTM D 4586
Uniformity & Workability	Acceptable as described	ASTM D 4586
Behavior @ 140°F	No blistering	ASTM D 4586
Pliability @ 32°F	No cracking/separation	ASTM D 45

C. Accessories:

1 Reinforcing fabric:

Test	Typical Value	Test Method
Weight	9.0 lbs./ 100 sq. ft.	ASTM D 1668
Fabric Count	10 x 10	ASTM D 1668
Tensile (Warp and Fill Directions)	75 lbf/in., min.	ASTM D 1668
Moisture Absorption	None	ASTM D 1668

2 Asphalt mastic:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Non-Volatile Matter by Weight	76-82%	ASTM D 4586
Viscosity @ 77°F	450,000 - 950,000 cps	ASTM D 2196
Density @ 77°F	9.5 - 10.0 lb/gal.	ASTM D 1475
Resistance to Sag @ 140°F	1/8" maximum	ASTM D 4586
Adhesion to Wet Surfaces	55%	ASTM D 3409
Moisture by Weight	1.5%	ASTM D 4586
Mineral or Other Stabilizers by Wt.	38%	ASTM D 4586
Asphalt by Weight	40%	ASTM D 4586
Uniformity & Workability	Acceptable as described	ASTM D 4586
Behavior @ 140°F	No blistering	ASTM D 4586
Pliability @ 32°F	No cracking/separation	ASTM D 45

3 Pitch pan sealant:

Test	Typical Value	Test Method
Uniformity	Pass	ASTM D 4479
Elongation	450%	ASTM D 2370
Solids by Weight	98.5%	ASTM D 4479
Density	10.6 lbs/gal.	ASTM D 1475
Viscosity	20,000 – 25,000 cps	ASTM D 2196
Flash Point	250°F minimum	ASTM D 93
VOC	25 g/l	ASTM D 6511
Asbestos Content	0%	EPA 600/R-93/116

4 Asphalt primer:

Test	Typical Value	Test Method
Asbestos Content	0%	EPA 600/R-93/116
Viscosity	100-200 cps	ASTM D 2196
Density	7.2 lbs/gal.	ASTM D 1475
Solids by Weight	43%	ASTM D 4479

Flash Point	101ºF minimum	ASTM D 93

5 Flashing tape:

Test	Typical Value	Test Method
Solids by Weight	100%	ASTM D 1353
Rubber Modifier	Polyisobutylene (Butyl Rubber)	Fourier Transform-Infrared Spectrosocpy
Hardness Shore ”A”	20 durometer @ 77°F	ASTM D 2240

6 Non-Shrink Grout: Quikrete FastSet™ Non-Shrink Grout

Approximate water content per bag	1 ½ gal (5.7 L)	
Flow, ASTM C 939	-	ASTM C 939
Flow, at 5 drops	125 – 145	ASTM C 827
Working Time	about 15 min.	
Setting Time		ASTM C 191
Final	20-45 min.	
Compressive Strength		ASTM C 109
3 Hours after set	2500 psi (17.2 MPa)	
24 Hours	4500 psi (31 MPa)	
7 Days	5500 psi (37.9 MPa)	
28 Days	7500 psi (51.7 MPa)	
Slant Shear Bond Strength		ASTM C 928
1 Day	1000 psi (6.9 MPa)	
7 Days	1500 psi (10.3 MPa)	

PART 3 - EXECUTION

3.1 BASE FLASHINGS

A. Preparation:
1. Remove existing flashing materials to substrate. Replace damaged material in like kind.
2. Prime vertical substrate with asphalt primer at approximate rate of one gallon per 125 - 150 sq. ft.
3. Install new roofing two inches beyond top edge of cant.

B. Base ply(s):

1. Fully adhere two (2) plies of specified base flashing completely to flashing substrate, cant, and roofing. Flashing should extend a minimum of 8" and maximum of 14” above finished roof membrane.

C. Cap ply:

1. Fully adhere a flashing top ply over base ply(s):
2. Mechanically fasten top of flashing to substrate; fasten minimum of 8 inches on center.
3. Seal top edge with a 4 inch wide stripping membrane embedded in alternating courses of specified Asphalt Mastic.
4. Strip in bottom edge of flashing with 4 inch wide stripping membrane and specified flashing adhesive.

5 Surface flashing with specified protective coating (if specified).
6 Install specified counterflashing system as per detail drawings.

D. Additional instructions for mineral surface flashing cap:

1 Snap a chalk line 6” from the toe of cant out onto roof membrane.
2 Measure the distance from the chalk line up the wall to where flashing will be terminated. On sloped roofs, take two measurements 1 meter (39”) apart.
3 Measure down length of a roll of specified membrane, and cut, in cross machine direction, a section same length. If roof is sloped, start at the bottom, and transfer height measurement to cutting of the flashing cap. Each section is 1 meter (39”) in width.
4 The joints of the membrane covering the deck should be staggered so that the membranes covering the vertical face of the parapet or curb do not coincide with those covering the deck.
5 Starting at the low end of the area being flashed, apply section in specified adhesive using a strapping method, overlapping the exposed smooth selvage with each new section. Bottom of flashing cap must be lined up 6” from toe of cant, on chalk line.
6 The salvage of the last section should be cut flush to the mineral surface prior to the application, ensuring that total flashing surface is mineral surfaced.
7 All areas where excessive adhesive is exposed on side laps may be coated with specified heat reflective coating or granules sprinkled in as flashing sections are installed.

E. Additional instructions for metal clad flashing cap:

1 Calculate the length of membrane required covering the flashing or curb.
2 Use 39” wide (roll width) strips of membrane cut from length of roll and install in a strapping to cover the vertical flashing area of the wall or curb. Overlap the smooth selvedge with each piece.
3 The joints of the membrane covering the deck should be staggered so that the membranes covering the vertical face of the parapet or curb do not coincide with those covering the deck.
4 Dry fit flashing pieces.
5 Note: If the bottom edge of the flashing is to be adhered to a granule surfaced modified bitumen field sheet, the granules in the lap areas of the field sheet must be embedded.
6 Using a chalk line, lay-out a straight line on the field membrane ply surface, parallel to the roof edge, six (6) inches inside the roof from the base of the previous base-flashing ply installed.
7 Using a torch and heated flat trowel, embed the surface granules into the heated and soft bitumen from the chalk line toward the flashing area. NOTE: this embedment procedure may also be accomplished through the use of granule embedment tool.
8 Solidly torch surfacing ply of flashing cap over the previously installed base ply or plies. Always work from the 3” selvedge. Using a damp sponge, apply pressure to the membrane to assure that it has made full contact with the substrate. Care should be taken not to deform the waffle pattern.
9 When preparing an outside or inside corner, where membrane will lap over the metal surfacing, the metal surfacing must be removed by the following procedure before welding membrane to itself:

10 Carefully score the metal surface with a sharp utility knife along the outer edge of area where metal is to be removed and bitumen is to be exposed (use straight blade, not hocked).
11 Care must be taken to cut only through the metal not through the membrane fabric reinforcement.
12 Lightly warm the surface of the metal to be removed using a torch enough to loosen the bond between the metal and bitumen.
13 Care must be taken to not overheat this area or scorching adjourning area of finished surfaces. Immediately after warming surface of metal, carefully peel off metal to be removed.
14 Additional warming and cutting may be necessary. To facilitate, warm the metal as you peel away metal.
15 Ensure the two membranes are perfectly welded, without air pockets, wrinkles, fish mouths or tears.
16 After installation of the top ply, check all lap seams on the top ply using a seam probe.
17 During installation, avoid asphalt seepage greater than ¼" at seams.

3.2 SURFACING

A. 2 coats of specified coating.

END OF SECTION 024119

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Prefabricated joint sealants

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples: For each kind and color of joint sealant required.

1.3 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Pecora Corporation.
b. Sika Corporation; Joint Sealants.

2.3 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Pecora Corporation.
b. Sika Corporation; Joint Sealants.
c. Tremco Incorporated.

2.4 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Pecora Corporation.
b. Tremco Incorporated.

2.5 PREFORMED, FOAM JOINT SEALS

A. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. EMSEAL Joint Systems, Ltd.

2. Design Criteria:

   a. Nominal Joint Width: 1 ½ inch.
   b. Movement Capability: -25 percent/+25 percent.

3. Joint Seal Color: As selected by Architect from full range of industry colors.

2.6 JOINT-SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

      a. BASF Corporation; Construction Systems.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.3 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces:

1. Joint Locations:

a. Construction joints in cast-in-place concrete.
b. Joints between plant-precast architectural concrete units.
c. Control and expansion joints in unit masonry.
d. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation joints in cast-in-place concrete slabs.
b. Control and expansion joints in tile flooring.

2. Joint Sealant: Urethane, S, NS, 25, NT
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Tile control and expansion joints.
c. Vertical joints on exposed surfaces of partitions.

2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement

1. Joint Locations:

a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.

2. Joint Sealant: Acrylic latex
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces:

1. Joint Locations:

    a. Seismic joint as indicated on Drawings:

2. Joint Sealant: Preformed, Foam Joint Sealant
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storefront framing.
2. Manual-swing entrance doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
2. Include point-to-point wiring diagrams.

C. Samples: For each type of exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.

B. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.

1.6 WARRANTY

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).

a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.

D. Structural: Test according to ASTM E 330/E 330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Entrance Doors:

a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. (2.54 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).

G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

H. Thermal Performance: The test unit will consist of an entire 3'0" x 7'0" (915 x 2134) flush panel door assembly and it shall be tested according to AAMA Specification 1503. The Thermal Transmittance Coefficient (U-factor) of the door panel shall not be more than 0.28 BTU/hr/sf/°F.

2.2 STOREFRONT SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Kawneer North America; an Alcoa company.
2. Basis of Design Product(s)/System(s): Kawneer Aluminum Entrances.
   a. Series: 350 Swing Doors
   b. Finish/Color: Kawneer 70% Fluoropolymer – See 2.8 Aluminum Finishes

B. Materials (Entrances and Components)
1. Material Standard: ASTM B 221; 6063-T6 alloy and temper
2. The door stile and rail face dimensions of the 350 entrance door will be as follows:
   a. Door – 350
   b. Vertical Stile: 3 ½ inch

c. Top Rail: 3 ½ inch
d. Bottom Rail: 10 inch

2. Major portions of the door members to be 0.125” nominal in thickness and glazing molding to be 0.05” thick.
3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of entrance members are nominal and in compliance with Aluminum Standards and Data, published by The Aluminum Association.
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.
6. Steel Reinforcement: As required by manufacturer.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 ENTRANCE DOOR SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Kawneer North America; an Alcoa company.
2. Basis of Design Product(s)/System(s): Kawneer Aluminum Entrances.
a. Series: Flushline® Entrances
b. Finish/Color: Kawneer 70% Fluoropolymer – See 2.8 Aluminum Finishes

B. Materials (Entrances and Components)
1. Material Standard: ASTM B 221; 6063-T6 alloy and temper
2. Door face sheets shall be plain (un-patterned) architectural quality 5005 alloy aluminum sheet 0.062" (1.6) thick.
3. Core of flush doors shall be froth-in-place urethane foam at 2.5 lb./cu. ft. density and shall have “0” O.D.P. = “Zero” Ozone Depletion Potential and contains no CFC’s (Chloro-fluorocarbons) or HCHC’s (Hydro Chlorofluorocarbons), Optional 5.0 lb. core available.
4. Vision lites shall be as shown on drawings
5. Glass for vision lites to be 1" (25.4) insulated tempered glass.
6. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of entrance members are nominal and in compliance with Aluminum Standards and Data, published by The Aluminum Association.

C. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.

2.4 ENTRANCE DOOR HARDWARE

A. General: Provide entrance door hardware and] for each entrance door, to comply with requirements in this Section.

1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
3. Opening-Force Requirements:
   Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

A. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.

B. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
4. Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 088000 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 ENTRANCE DOOR HARDWARE SET

3	Hinges	4½ x 4½ NRP	Kawneer
1	Electric Strike	HES-9600	HES
1	Exit Device	98/99 Exit Device	Von Duprin
1	Pull	CO-12	Kawneer
1	Auto Door operator	D-4990 Low Energy Operator	Stanley
1	Power Supply	SP-1000X	Kawneer
1	Threshold	S88D	Kawneer
1	Set Weather-stripping	315 CN – Door Bottom	Pemko

1.

a. The door weathering on a single acting offset pivot or butt hung door and frame shall be manufacturer’s standard weathering. This is comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
b. 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. (Necessary to meet specified performance tests.)
c. Threshold: Extruded aluminum, one piece per door opening, with ribbed surface.

END OF SECTION 084113

SECTION 084233 - REVOLVING DOOR ENTRANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections: See Section 012300 Alternates

B. Section Includes:

1. Manual revolving door entrances.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For revolving door entrances.

1. Include plans, elevations, sections, and attachment details.
2. Indicate enclosures, speed-control units, and other components not in manufacturer's product data.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative, with certificate issued by AAADM, who is trained for installation and maintenance of units required for this Project.

B. Manufacturer Qualifications: A qualified manufacturer having been in revolving door manufacturing for a minimum of 10 years in North America.

C. Manufacturer shall have in place a national service dispatch center providing 24 hours a day, 7 days a week, emergency call back service.

D. Certifications: Revolving door entrance systems shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards:
1. ANSI/BHMA A156.27.
2. NFPA 101.

E. Source Limitations: Obtain revolving entrance door assemblies through one source from a single manufacturer.

F. Product Options: Drawings indicate sizes, profiles, and dimensional requirements of revolving entrance door assemblies and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

G. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."

H. Means-of-Egress Requirements: Comply with requirements of authorities having jurisdiction for revolving entrance doors serving as a component of a means of egress, including capability of collapsing into a book-fold position, minimum exit width, maximum turning speed, and maximum force required to collapse door wings.

I. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201. Subject to compliance with requirements, permanently mark safety glass with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

1.6 WARRANTY

A. Revolving Entrance Doors shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.

C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Provide revolving entrance door assemblies that have the following capability based on testing manufacturer's standard units similar to those indicated for this Project:

B. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.0 cfm/sq. ft. (5.0 L/s x sq. m) of fixed entrance system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).

C. Thermal Movements: Provide revolving entrance doors that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Operating Range: Minus 20 deg F to plus 130 deg F (Minus 29 deg C to plus 54 deg C).

2.2 MANUAL REVOLVING DOOR ENTRANCES

A. Manufacturer: Stanley Rush a division of Stanley Access Technologies; Series 1500 revolving entrance doors with manual speed control.

2.3 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
2. Sheet and Plate: ASTM B 209 (ASTM B 209M).
3. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

B. Stainless Steel:
1. Bars and Shapes: ASTM A 276, Type 304.
2. Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.
3. Welding Electrodes and Rods: AWS A5.9.

C. Fasteners: Manufacturer's standard, of same basic metal as fastened metal, unless otherwise indicated.

2.4 REVOLVING ENTRANCE DOOR ASSEMBLIES

A. General: Provide manufacturer's standard revolving entrance door assembly, complete with door wings, enclosure walls, ceiling, hardware, glass, speed controls, and accessories as indicated.

B. Revolving Entrance Door Assembly:
1. Operation: Manual with overhead mounted speed control.
2. Configuration: 4 Wing
3. Construction: Fully framed enclosure and door wings.

2.5 COMPONENTS

A. Stile-and-Rail Door Wings: Manufacturer's standard 1-1/4 inch (32 mm) thick, glazed doors with tubular stile-and-rail members.
   1. Material: Extruded aluminum.
   2. Glazing: CAN/CGSB 12.3 M91: CAN/CGSB12.1: ASTM C 1048; Quality Q3; Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent flat glass).
      a. Class 1 (clear)
      b. Thickness: 1/4 inch (6mm)
   3. Stile Design: Narrow stile; 1 1/2-inch (38 mm) nominal width.
   4. Rail Design: 4 inch (102 mm) nominal height.

B. Center Shaft: Manufacturer's standard, solid steel shaft with anodized aluminum extrusion cover.

C. Enclosure Walls: Manufacturer's standard 1-1/2 inch (38 mm) thick, glazed framing with tubular members.
   1. Configuration: Curved with single-bend glass lites.
   2. Material: Extruded aluminum.
   3. Glazing: ASTM C 1048; Quality Q3; CAN/CGSB 12.3 M91: CAN/CGSB 12.1; Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent flat glass) float glass, laminated.
      a. Bent Glass: ASTM C 1464; Kind BFT.
      b. Class 1 (clear).
      c. Thickness: 1/4 inch (6 mm) tempered glass.
   4. Rail Design: 4 inch (102 mm) nominal height.

J. Ceilings: Manufacturer's standard, complying with the following:
   1. Metal: Fabricate soffit and fascia from minimum 0.125 inch (3.2 mm) thick, formed metal sheet matching enclosure walls on brake-formed galvanized sheet or clear anodized aluminum extrusion sub-frame. [Provide access panels for repairs or maintenance to speed controls and collapsing mechanisms.]
   2. Roof: 0.062 inch (1.6 mm) thick roof sheet fastened to canopy sub-frame and caulked when appropriate for weather proofing.
   3. Ceiling Lights: Manufacturer's standard consisting of two recessed LED light fixtures within the revolving entrance door enclosure ceiling, complete with lamps and lenses.

D. Canopy: Manufacturer's standard units with minimum 1/8 inch (3 mm) wall thickness, with layout matching diameter of enclosure walls and with panel sides of material and finish matching enclosure walls. Canopy roof shall be manufacturer's standard, of material and finish matching enclosure walls where visible. Coordinate canopy roof with canopy above to

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

F. Signage: Provide signage in accordance with ANSI/BHMA A156.27.

2.6 EQUIPMENT

A. Manual Speed-Control Unit: Provide an electronic overhead speed regulator that allows free rotation of door wings up to a predetermined rate of speed and that engages a brake to prevent rapid acceleration of door wings.
   1. Maximum Speed: 11 rpm.
   2. Location: Overhead.

B. Panic-Collapsing Mechanism: Manufacturer's standard concealed device that permits all door wings to automatically release from their normal positions and move outward into the book-fold position when pressure is applied to outer stiles. Unit shall allow pressure adjustment from 100 to 180 lbf (445 to 800 N) and shall be set in accordance with ANSI/BHMA A156.27. Systems incorporating visible collapsing mechanism attached to the door wings or between door wings are not permitted.

C. Push Bars: Manufacturer's standard 304 stainless steel round bars, 1 inch (25 mm) in diameter.

D. Locks: Manufacturer's standard deadbolt locks to receive cylinders; minimum of two for each revolving entrance door.
   1. Cylinders: Comply with requirements in Division 8 Section "Door Hardware."
   2. Mounting: Mortised.
   3. Location: Extend bolt from bottom of door wing into base of wall enclosure.

E. Weather Seals: Manufacturer's standard replaceable components as follows:
   1. Top Rail and Vertical Stile: Rubber and felt combination.
   2. Bottom Rail and Shaft: Rubber.

2.7 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

   1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
   2. Sheet and Plate: ASTM B 209 (ASTM B 209M).

B. Stainless Steel:

   1. Bars and Shapes: ASTM A 276, Type 304.
   2. Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.
   3. Welding Electrodes and Rods: AWS A5.9.

C. Fasteners: Manufacturer's standard, of same basic metal as fastened metal, unless otherwise indicated.

D. Nonshrink, Nonmetallic Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout; complying with ASTM C 1107/C 1107M; of consistency suitable for application.

E. Corrosion-Resistant Coating: Cold-applied asphalt mastic.

2.8 FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
   1. Color to be white.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine conditions for compliance with requirements for installation tolerances, and other conditions affecting performance of revolving entrance doors.

B. Examine rough-in for recessed, floor mounted speed-control units to verify actual unit location before equipment installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight. Do not install damaged components.

   1. Where aluminum contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
   2. Where aluminum contacts concrete or masonry, protect against corrosion by painting contact surfaces with corrosion-resistant coatings.

B. Install revolving door entrances according to manufacturer's written instructions, plumb and true, without warp or rack of framing members and wings. Anchor securely in place.

   1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
   2. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the assembly to exterior.
   3. Cut and trim framing during installation only with approval of manufacturer.

      a. Restore finish and remove and replace members, as directed, where cutting and trimming have impaired strength or appearance.
      b. Do not install members that are warped, bowed, deformed, or otherwise damaged or defaced to such an extent as to impair strength or appearance. Remove and replace members that have been damaged during installation.

C. Activation and Safety Devices: Adjust devices to provide detection field and functions indicated.

D. Sealants: Comply with requirements specified in Section 079200 "Joint Sealants" to provide weathertight installation.

1. Set continuous sill members and flashings in full sealant bed.
2. Seal perimeter of framing members with sealant.

E. Adjust wings to provide an even, tight fit at contact points and weather stripping for smooth operation and weathertight closure. Adjust wings to operate smoothly and rotate evenly, with hardware and operators functioning properly.

1. Lubricate operating hardware and other moving parts.
2. Adjust speed-control unit for specified rpm.
3. Adjust pressure for collapse of wings for specified breakaway force.

F. Readjust wings and speed-control units after three days' use by normal traffic. Lubricate hardware and other moving parts.

END OF SECTION 084233

SECTION 085200 - WOOD WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes aluminum-clad wood windows.

B. SUBSTITUTION'S will not be accepted for this product.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: For each exposed product and for color specified.

1.4 COORDINATED MOCKUP

A. Provide mock-up Aluminum clad wood window sill section, in combination with 4'-0" x 4'0" Brick Mock- up, including flashing, type and color of brick, mortar type and color, joint type, weep holes and cast stone sill piece window sill piece with flashing, aluminum/wood window sill and flashing for verification 10 days prior to start of installation, in separate location onsite as determined by owner.

1.5 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.6 QUALITY ASSURANCE

A. Source: For each material type required for the work of this Section, provide primary materials

That are the product of one manufacturer. Provide secondary or accessory materials which are acceptable to the manufacturers of the primary materials.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Window: 10 years from date of Substantial Completion.
b. Glazing Units: 10 years from date of Substantial Completion.
c. Aluminum-Cladding Finish: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: WDMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: LC.
2. Minimum Performance Grade: 70**.**

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

2.2 WOOD WINDOWS

A. Aluminum-Clad Wood Windows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. EAGLE Window & Door, Inc.; a subsidiary of Andersen Corporation.

B. Operating Types: Fixed.

C. Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide; water-repellent preservative treated.

1. Exterior Finish: Aluminum-clad wood.

a. Aluminum Finish: Manufacturer's standard baked-on enamel finish
b. Color: White, as selected by Architect from manufacturer's full range of colors.

2. Interior Finish: Manufacturer's standard factory-prime coat, and 2 final field coats of paint as specified.

D. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.

1. Kind: Fully tempered, as required by code.

E. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Smart Sun Glass.
b. Kind: Fully tempered, as required by code.

2. Lites: Two.
3. Filling: Fill space between glass lites with air.
4. Low-E Coating: Low-E4 Coating Smart Sun Glass

F. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal

G. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

H. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.3 ACCESSORIES

A. Dividers (False Muntins): Provide divider grilles in designs indicated for each sash lite.

1. Quantity and Type: Two per sash, permanently located at exterior and interior lites.
2. Material: Wood interior, Aluminum exterior.
3. Pattern: 1 ½”.
4. Profile: Colonial.

5. Color: As selected by Architect from manufacturer's full range.

B. Mull connectors: as indicated on drawings.

C. Window Casing: #A755

D. Deep Sill Nosing: #A752

E. Head, jamb and sill extenders: as indicated on drawings.

2.4 FABRICATION

A. Fabricate wood windows in sizes indicated. Include a complete system for installing and anchoring windows.

B. Glaze wood windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

D. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.

E. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085200

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Glass for windows, doors and storefront framing.
2. Glazing sealants and accessories.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

C. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 20 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Cardinal Glass Industries

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings.

B. Safety Glazing: Where safety glazing is indicated or required by code, provide glazing that complies with 16 CFR 1201, Category II.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated or required by code, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

D. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

1. Sealing System: Dual seals.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Dow Corning Corporation.
b. Pecora Corporation.
c. Sika Corporation.
d. Tremco Incorporated.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.3 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.6 INSULATING GLASS SCHEDULE

A. Glass Type GL-1: Low-E-coated, clear insulating glass.

1. Basis-of-Design Product: Window manufacturer’s standard.
2. Overall Unit Thickness: 1 inch.
3. Outdoor Lite: Heat-strengthened or fully tempered float glass.
4. Interspace Content: Air.
5. Indoor Lite: Heat-strengthened or fully tempered float glass.
6. Low-E Coating: Pyrolytic or sputtered on second or third surface.
7. Safety glazing as required.

END OF SECTION 088000

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Georgia-Pacific Building Products.
   b. National Gypsum Company.
   c. USG Corporation.

2. Thickness: 1/2 inch.

3. Long Edges: Tapered

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Georgia-Pacific Building Products.
b. National Gypsum Company.
c. USG Corporation.

2. Thickness: 5/8 inch.

3. Long Edges: Tapered

C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Georgia-Pacific Building Products.
b. National Gypsum Company.
c. USG Corporation.

2. Thickness: 1/2 inch.

3. Long Edges: Tapered.

2.4 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Georgia-Pacific Building Products.
b. National Gypsum Company.
c. USG Corporation.

2. Core: 1/2 inch, regular type.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc
2. Shapes:

    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.
    d. Expansion (control) joint.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
2. Shapes:
    a. LC-Bead: J-shaped; exposed long flange receives joint compound.
    b. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

    a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Grabber Construction Products.
b. Pecora Corporation.
c. Specified Technologies, Inc.
d. USG Corporation.

F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

G. Vapor Retarder: As specified in Section 072600 "Vapor Retarders."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C 840.

C. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panel’s not less than one framing member.

D. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

F. Form control and expansion joints with space between edges of adjoining gypsum panels.

G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

I. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

J. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

K. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Porcelain tile.
   2. Waterproof membrane.
   3. Crack isolation membrane.
   4. Metal edge strips.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

   1. Each type and composition of tile and for each color and finish required.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

   2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
   2. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

A. Porcelain Floor Tile **T1** and Base **B1**:

Floor Tile T1

Manufacturer:	Garden State Tile
Style:	Renova Slate Look
Size:	16” x 32 x 3/8”
Color:	T.B.D.

Base Tile B1

Manufacturer:	Garden State Tile
Style:	Renova Battiscopa
Size:	3” x 24”
Color:	T.B.D.

Grout for T1 and B1

Manufacturer:	Laticrete
Product:	SpectraLock Pro
Color:	T.B.D.

2.3 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.

1. Manufacturers: Provide the following:

a. Laticrete International, Inc., 9235 Waterproofing Membrane.

2.4 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.

1. Manufacturers: Provide one of the following:

a. Laticrete International, Inc., Blue 92 or 9235 Waterproofing Membrane.

2.5 SETTING MATERIALS

A. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.

1. Manufacturers: Provide the following:

a. Laticrete International, Inc., 254 Platinum Multipurpose Thinset Mortar

2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.6 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3.

1. Manufacturers: Provide the following:

a. Laticrete International, Inc.. SpectraLOCK PRO grout.

2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F (60 and 100 deg C), respectively, and certified by manufacturer for intended use.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

   a. Schluter Systems L.P,

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
   3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
   4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
   a. Tile floors consisting of tiles 8 by 8 inches or larger.
   b. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
1. Porcelain Tile: 3/8 inch

G. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

H. Metal Edge Strips: Install exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

I. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

J. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

3.4 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.5 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Radiant Heat Floor Installations, Concrete Subfloor:

1. Ceramic Tile Installation: TCNA RH110; thinset mortar on crack isolation membrane; hydronic piping installed in concrete.

a. Ceramic Tile Type: Porcelain
b. Thinset Mortar: Latex-Portland cement mortar.
c. Grout: Water-cleanable epoxy grout.

END OF SECTION 093013

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modular carpet tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture required.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Lifetime commercial warranty.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Carpet Tile W0:

Manufacturer:	Shaw Contract
Style Number:	5T035
Style Name:	Portal Tile
Color:	T.B.D., from manufacturer’s full range.

Size: 24” x 24”
Installation Method: Monolithic

Shaw Contract Carpet Characteristics – W0:
1. Fiber Type: eco solution q nylon
2. Construction: multi-level pattern loop.
3. Density: 7814 oz./cu. yd.
4. Pile Thickness: 0.129
5. Stitches: 9.0 inch.
6. Gage: 1/12
7. Tufted Weight: 28.0.
8. Primary Backing/Backcoating: synthetic.
9. Secondary Backing: ecoworx tile
10. Size: 24 by 24 inches (610 by 610 mm).
11. Applied Treatments: Soil-Resistance Treatment: SSP Shaw Soil Protection

2.2 INSTALLATION ACCESSORIES:

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI's "CRI Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

I. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior and exterior substrates:
   1. Wood.
   2. Gypsum board.
   3. Galvanized Metal.
   4. Plastic.
   5. Exterior Gypsum board.

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

   1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples: For each type of paint system and in each color and gloss of topcoat.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Benjamin Moore & Co.
2. Glidden Professional.
3. PPG Architectural Coatings.
4. Pratt & Lambert.
5. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Colors: As selected by Architect from manufacturer's full range

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. Wood Substrates: Wood trim, Architectural woodwork and Windows.

1. Institutional Low-Odor/VOC Latex System MPI INT 6.3V:

a. Prime Coat: Primer, latex, for interior wood, MPI #39.

1) Benjamin Moore Fresh Start High Hiding All Purpose Primer 046.

b. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.

1) Benjamin Moore Ultra Spec 500 Waterborne Interior Gloss N540.

B. Gypsum Board Substrates:

1. Institutional Low-Odor/VOC Latex System MPI INT 9.2M:

    a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.

        1) Benjamin Moore Eco Spec WB interior latex primer N372.

    b. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3), MPI #145.

        1) Benjamin Moore Ultra Spec 500 Interior Latex Eggshell Finish N374.

3.6 EXTERIOR PAINTING SCHEDULE

A. Galvanized-Metal Substrates:

1. Latex System:

    a. Prime Coat: Primer, galvanized, water based, MPI #134.

        1) Benjamin Moore Ultra Spec HP D.T.M.

    b. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #141.

        1) Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel

A. Plastic Trim Fabrication Substrates:

1. Latex System:

    a. Prime Coat: Primer, bonding, water based.

        1) Benjamin Moore Insl-X Stix Waterborne Bonding Primer SXA-110

    b. Intermediate Coat: Latex, exterior, matching topcoat.

    c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

        1) Benjamin Moore Ben Waterborne Exterior Soft-Gloss 543.

A. Exterior Gypsum Board Substrates:

1. Latex System:

    a. Prime Coat: Primer, latex for exterior wood (reduced), MPI #6.

        1) Benjamin Moore Fresh Start High-Hiding All Purpose Primer

    b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, flat (MPI Gloss Level 1)**,** MPI #10.

1) Benjamin Moore Ben Waterborne Exterior Flat 541.

END OF SECTION 099100