



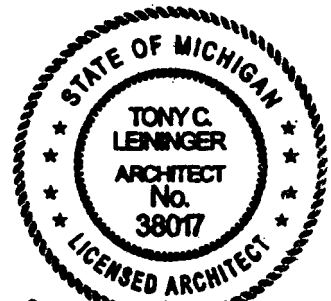
68817 Cass St. / P.O. Box 627
Edwardsburg, MI 49112

Project Manual

Administration Building & North Pointe Center Window Replacement

Lewis Cass Intermediate School District
Cassopolis, Michigan

Issue Date:
9 July 2015



A handwritten signature in black ink, appearing to read 'TONY C. LENINGER'.

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INVITATION TO BID

PROJECT NAME: Administration Building & North Pointe Center Window Replacement

PROJECT DESCRIPTION:

Remove and dispose of all identified existing windows and related components in their entirety. Provide labor and material for installation of new windows, including all necessary flashing and dissimilar material sealant/backer rod. Repair contiguous materials/finishes as necessary. A separate contract will be awarded for each location.

OWNER: Lewis Cass Intermediate School District
61682 Dailey Road
Cassopolis, MI 49031

(Administrative Offices)

ARCHITECT: CARMI Design Group
68817 Cass Street
P.O. Box 627
Edwardsburg, MI 49112
Phone: 269-663-5073

BID DATE:

Bids will be received at the ISD's Administrative Offices until **10:00 AM [local time] July 23, 2015.**

Bids will be publicly opened at the ISD's Administrative Offices and read aloud at this time. Bids received after this time will not be considered and will be returned to the bidder unopened.

Bids shall be properly and completely executed on the Bid Proposal Form included within the Project Manual and submitted in duplicate. Bids shall be clearly marked as "**Lewis Cass ISD Window Replacement**" on the front of the submitted envelope.

PRE-BID MEETING:

A mandatory Pre-Bid Meeting for both contracts will be held at the ISD's Administrative Offices, on **July 16, 2015 at 10:00 AM [local time].**

DOCUMENT AVAILABILITY AND USE:

Bid Documents may be viewed at the following **Plan Rooms** on or after **July 9, 2015.**

Builders Exchange of
Kalamazoo
3431 East Kilgore Street
Kalamazoo, MI 49001-5513

Builders Exchange of
Grand Rapids
4461 Cascade Road SE
Grand Rapids, MI 49546

McGraw-Hill Construction
Dodge
401 Hall Street SW
Suite 128B
Grand Rapids, MI 49503

McGraw-Hill Construction
Dodge
2521 E. Michigan Ave.
Lansing, MI 48912

CDC News
One Oakbrook Terrace
Oakbrook Terrace, IL 60181

Construction Association
of Michigan
43636 Woodward St.
Bloomfield Hills, MI 48302

Bid Documents may be obtained at the **Architect's office** on or after **July 9, 2015.**

Bona Fide bidders may obtain Bidding Documents from the Architect's Office upon payment of \$50.00 for each set with a limit of three (3) sets. Checks made payable to CARMI Design Group. Please note that the

P.O. Box must be included when sending items to CARMI Design Group via the USPS or it will not be delivered.

Bidding documents are also available electronically at no charge, via email. Please email your request to Susan Weiss, sweiss@carmi.biz and include company name, address, phone and fax numbers.

Said Payment for Bidding Documents shall be refunded to bidders, provided Bidding Documents are returned intact and in good condition to the Architect within five (5) calendar days after bid due date. There will be no exceptions.

BONDS:

A five percent (5%) Bid Bond shall accompany each bid. The successful bidder will be required to provide a Performance Bond and Labor and Material Bonds for bids exceeding \$50,000, and certificates of Liability and Worker's Compensation Insurance.

OTHER CONDITIONS AND INFORMATION:

1. Each bid shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the bidder and any member of the Lewis Cass ISD board of education or the superintendent of the school district.
2. No bidder may withdraw their bid for a period of **Thirty (30) calendar days** after the date set for bid opening.
3. Public Act 517 of 2012 (effective December 31, 2012) enacted the "Iran Economic Sanctions Act", which prevents "Iran linked businesses" from bidding on a school district or ISD's request for proposals ("RFP"). This law requires that persons submitting bids certify that they are not an "Iran linked business," which is defined as either:
 - a) A person engaging in investment activities in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers or products used to construct or maintain pipelines used to transport oil or liquefied natural gas for the energy sector of Iran; or
 - b) A financial institution that extends credit to another person, if that person will use the credit to engage in investment activities in the energy sector of Iran.
4. Lewis Cass ISD reserves the right to reject any or all bids, to waive any defects or irregularities in bids, and to accept any bid which is deemed most advantageous to the public interest.

INSTRUCTIONS TO BIDDERS

- A. No bid received after the specified date and time for opening, whether post dated or not, will be considered.
- B. If any of the required bidding documents are not included, or properly executed, the contractor's bid may not be accepted.
- C. The Owner reserves the right to reject each and every bid, to waive formalities or informalities in bidding, to accept or reject each and every alternate regardless of its order or sequence, unless otherwise called for on the bid Proposal Form.
- D. The right is reserved to reject a Bid where an investigation of the available evidence of information does not satisfy the Owner that the Bidder is qualified to properly carry out the terms of the Contract Documents.
- E. Bids which contain qualifications or conditions that are contrary to the text or intent of the Contract Documents, and which are inserted in the bid for the purpose of limiting or otherwise qualifying the responsibility of the bidder, outside of the text or intent of the Contract Documents, will be subject to disqualification.
- F. Failure to submit the requested information with the Bid shall be grounds for rejecting the Bid.
- G. The Owner also reserves the right to reject the bid of a Bidder who has previously failed to perform properly or to complete contracts of similar nature on time, who is not in a position to perform the Contract or who has habitually and without just cause neglected the payment of bills or otherwise disregarded his obligations to subcontractors, suppliers, or employees.
- H. Payment / Performance Bonds are required for this contract.
- I. The ability of the Bidder to obtain or qualify for a performance bond or payment bond shall not be regarded as a sole test of such Bidders competence or responsibility.
- J. This project is not tax exempt.
- K. Bidder must have comparable experience with the type and scale of this project; submit a list of similar projects completed within the last 5 years. Failure to submit the requested information with the Bid shall be grounds for rejecting the Bid.**
- L. See Summary Section 01100 for project scope of work.**
- M. Schedule**
Contract 1: Substantial Completion: 16 weeks from Notice to Proceed
Contract 2: Substantial Completion: 10 weeks from Notice to Proceed
Bidders unable to adhere to this schedule shall qualify with their bid.

The Bidder may, at his option, submit a voluntary alternate, stating the optional material and/or methods which he proposes to use, and all brochures, data manuals, etc., describing the specifics of such materials or equipment. No voluntary alternate products will be evaluated prior to bidding. The Architect and Owner reserve the right to accept or reject such options, and all Bidders, in consideration of the privilege of bidding, do now specifically waive all rights both legal and equitable which he has or might be construed to have against the Architect and Owner because of the action taken in accepting or rejecting

such options and/or any other proposals or bids for any reason whatsoever. Said Bidder who files an action based thereon shall be liable for any resultant, reasonable attorneys' fees incurred by the Architect and/or Owner.

BID FORM

PROJECT: **Administration Building &
North Pointe Center
Window Replacement**

OWNER: **Lewis Cass Intermediate
School District**
61682 Dailey Road
Cassopolis, MI 49031

PROPOSAL FROM: _____

Company Name

Address

CONTRACT NO. 1 – North Pointe Center Window Replacement

Base Bid: Slider Windows (include cost for 650 LF of sealant for existing fascia system)

_____ \$ _____ Base Bid
Written Amount

Base Bid Alternate: Casement Windows (include cost for 650 LF of sealant for existing fascia system)

_____ \$ _____
Written Amount

Alternate 1 (storefronts)

_____ \$ _____ Add
Written Amount

Sealant / backer rod unit cost \$ _____ /LF

CONTRACT NO. 2 – Administration Building Window Replacement

Base Bid (replace all lower level windows)

_____ \$ _____ Base Bid
Written Amount

Alternate 1 (replace all main level windows)

_____ \$ _____ Add
Written Amount

Sealant / backer rod unit cost \$ _____ /LF

Voluntary Alternate *(if provided)*

Description

Written Amount _____ \$ _____ (Add/Deduct)

Pre-Bid Meeting	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
5% BID BOND:	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
Familial Relationship Statement	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
Not an "Iran Linked Business" Certification	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
Acknowledge Receipt of: ADDENDUM NO.	ONE	<input type="checkbox"/>	TWO	<input type="checkbox"/>

SUBMITTED BY:

Signature

Date: _____, 2015

Printed

Title

OWNER-CONTRACTOR AGREEMENT

A. OWNER-CONTRACTOR AGREEMENT

AIA Document A101 (2007 Edition) Owner-Contractor Agreement is hereby included by reference as the agreement to be executed between the Owner and the Contractor. Copies of this document are available from the Architect's office. Contract to be issued by Architect for execution of signatures.

END OF SECTION

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

A. GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

AIA Document A201 (2007 Edition) General Conditions of the Contract for Construction is hereby the reference for this contract. Copies of this document are available from the Architect's office. Refer to Supplementary General Conditions of the Contract for Construction, included in this manual, for revisions to AIA Document A201 as they apply to this project.

SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the General Conditions of the Contract for Construction (AIA A201 – 2007) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented shall remain in full force and effect.

Article 1 – General Provisions

- 1.1.6 Delete this paragraph in its entirety.
- 1.1.7 Add the following sentence to this paragraph;

Also included are the Specifications: that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

- 1.2 Add the following:

- 1.2.4 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities.

- 1. The Agreement.
 - 2. Addenda, with those of later date having precedence over those of earlier date.
 - 3. The Supplementary Conditions.
 - 4. The General Conditions of the Contract for Construction.
 - 5. Drawings and Specifications.

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

Article 3 – Contractor

- 3.3 Add the following:

- 3.3.4 It is the responsibility of the Prime Contractor to perform the Work in accordance with the General Conditions, Supplementary Conditions, Division One or any work described elsewhere in the Contract Documents that relates to their respective trade.

- 3.5 Add the following:

- 3.5.2 The Prime Contractor shall guarantee his work in writing for a period of one (1) year from the date of Substantial Completion, except where a longer guarantee is specifically called for in the Contract Documents.

- 3.10 Add the following:

- 3.10.4 The General Construction / Prime Contractor shall be responsible for the preparation and submission of a construction schedule as set forth in Section 01320.

Article 4 – Administration of the Contract

- 4.1.2 Delete the word "Contractor".

4.1.3 Delete the words “against whom the Contractor has no reasonable objection”.

Article 7 –Changes In The Work

Add the following:

7.5 ADJUSTMENTS TO CONTRACT SUM

7.5.1 Cost Changes in the work performed under Items 7.2.1 and 7.3.1 above shall be limited to a mark-up by the Contractor performing the work as follows:

- .1 Cost of labor including social security, old age and unemployment insurance, fringe benefits required by agreement or custom and worker’s or workmen’s compensation insurance plus 10 percent (10%).
- .2 Cost of materials, equipment and machinery plus ten percent (10%).

7.5.2 Cost changes in the work performed under Items 7.2.1 and 7.3.1 above shall be limited to a mark-up by each subsequent level of Contractor of five percent (5%).

Article 9 – Payments and Completion

9.3.2 Delete sentences two (2) and three (3) in their entirety.

9.6 Add the following:

9.6.1.1 Payments on account of the contract shall be made for labor and materials incorporated into the work at the rate of ninety-five percent (95%) of such value until the work is complete. All retainage and interest thereof will be held in escrow at a bank or institution selected by mutual agreement between the Owner and Contractor. Interest in the retainage shall go to the Contractor.

Article 11 – Insurance and Bonds

11.1 Add the following:

11.1.1 In the first line, following the word “companies”, insert the following: “acceptable to the Owner and”

11.1.2 Add the following:

11.1.2.1 Insurance coverage shall not be less than the following:

- A. Workmen’s Compensation: Statutory
Employer’s Liability: As Applicable
- B. Comprehensive General Liability: Include Premises, Operations, Independent Contractor’s Protection, Products and Completed Operations, Broad Form Property Damage.

- 1. Bodily Injury; \$1,000,000 Each Occurrence
\$3,000,000 Aggregate Products and Completed Operations
- 2. Property Damage: \$ 500,000 Each Occurrence
\$1,000,000 Aggregate

- C. Products and Completed Operations Insurance shall be maintained for one (1) year after final payment and Contractor shall provide evidence of such coverage to the Owner prior to the final payment.
- D. Property Damage Liability Insurance shall include for Explosion, Collapse and Underground.
- E. Contractual Liability (Hold Harmless Coverage)
 - 1. Bodily Injury \$1,000,000 Each Occurrence
 \$3,000,000 Aggregate
 - 2. Property Damage: \$ 500,000 Each Occurrence
 \$1,000,000 Aggregate
- F. Comprehensive Automobile Liability (Owned, Non-Owned, Hired)
 - 1. Bodily Injury \$1,000,000 Each Occurrence
 \$3,000,000 Aggregate
 - 2. Property Damage: \$ 500,000 Each Occurrence
- G. Excess Liability, Umbrella Form: \$1,000,000
- H. Performance and Labor / Material Payment Bonds
- I. **Name Owner and Architect as additional insured parties.**

11.4 Add the following:

11.4.1 Line one; replace the phrase "Owner, the Contractor" with "Prime Contractors".

END OF SECTION

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: **Administration Building & North Pointe Window Replacement**

1. Project Locations: **North Pointe Center: 704 N. Orchard, Dowagiac, MI 49047**
Administration Building: 61682 Dailey Rd, Cassopolis, MI 49031
2. Owner: **Edwardsburg Public Schools,**
69410 Section St., Edwardsburg, MI 49112

Architect Identification: The Contract Documents, dated July 9, 2015 were prepared for this project by *CARMI Design Group, Inc., 68817 Cass Street / P.O. Box 627 Edwardsburg, Michigan 49112.*

B. **SCOPE OF WORK:**

Remove and dispose of all identified existing windows and related components in their entirety. Provide labor and material for installation of new windows, including all necessary flashing and dissimilar material sealant/backer rod. Repair contiguous materials/finishes as necessary. Two separate contracts will be awarded.

CONTRACT 1: North Pointe Center

Base Bid: Wausau 4100i HS slider windows; standard 1" IG unit. Include cost for 650 LF of sealant for existing metal fascia system

Base Bid Wausau 4250i casement windows; standard 1" IG unit. Include cost for 650 LF of sealant for existing metal fascia system
Alternate:

Alternate 1: Tubelite T14000 Series storefront systems; standard 1" IG unit.

Sealant / backer rod unit cost (\$/LF)

CONTRACT 2: Administration Building

Base Bid: Replace all lower level windows with Andersen 400 Series casement windows.

Alternate 1: Replace all upper level windows with Andersen 400 Series casement windows.

Sealant / backer rod unit cost (\$/LF)

1.2 USE OF PREMISES

1. General: Contractor shall have limited use of premises for construction operations, including use of Project site, during construction period. Refer to Section 01140 - Work Restrictions for details.

1.3 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat" numbering system.

- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION 01100

SECTION 01140 - WORK RESTRICTIONS

PART 1 - GENERAL

1.1 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
1. Limits: Confine constructions operations to areas indicated on drawings.
 2. Owner Occupancy: Allow for Owner occupancy of site and use by the public.
 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.2 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01140

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 7 calendar days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709.

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven calendar days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
 - 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period covered by each Application for Payment shall not exceed 31 calendar days.
- D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 48 hours. One copy shall include waivers of lien and similar attachments if required.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

- a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. List of Contractor's staff assignments.
 5. Copies of building permits.
 6. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 7. Certificates of insurance and insurance policies.
 8. Performance and payment bonds.
 9. Data needed to acquire Owner's insurance.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims.
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens.
 6. AIA Document G707, "Consent of Surety to Final Payment.
 7. Evidence that claims have been settled.

END OF SECTION 01290

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General Project coordination procedures.
 - 2. Project meetings.
- B. See Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with sub-contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Project closeout activities.

1.3 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 calendar days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 calendar days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing.
 - c. Designation of responsible personnel.
 - d. Procedures for processing field decisions and Change Orders.
 - e. Procedures for processing Applications for Payment.
 - f. Distribution of the Contract Documents.
 - g. Submittal procedures.
 - h. Preparation of Record Documents.
 - i. Use of the premises.
 - j. Responsibility for temporary facilities and controls.
 - k. Parking availability.
 - l. Office, work, and storage areas.
 - m. Equipment deliveries and priorities.
 - n. First aid.
 - o. Security.
 - p. Progress cleaning.
 - q. Working hours.
- C. Progress Meetings: Conduct progress meetings at bi-weekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Review present and future needs of each entity present, including the following:

- 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
 - 14) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Daily construction reports.
 - 3. Field condition reports.
- B. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
- C. See Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.2 SUBMITTALS

- A. Contractor's Construction Schedule: Submit two printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.
- B. Daily Construction Reports: Submit two copies at weekly intervals.
- C. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

1.3 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 28 calendar days, unless specifically allowed by Architect.
 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than one day for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording events at Project site, including the following:
1. List of subcontractors.
 2. High and low temperatures and general weather conditions.
 3. Accidents.
 4. Stoppages, delays, shortages, and losses.
 5. Orders and requests of authorities having jurisdiction.
 6. Services connected and disconnected.
 7. Equipment or system tests and startups.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
 3. Field Office Prints: Retain one set of prints of periodic photographs in field office at Project site, available at all times for reference. Identify photographs the same as for those submitted to Architect.

END OF SECTION 01320

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
- C. See Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. 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. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.
 - 1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Allow 14 calendar days for processing each resubmittal.
 - 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- C. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information on label for processing and recording action taken:

- a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Unique identifier, including revision number.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Other necessary identification.
- D. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- E. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
- 1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
- F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
- G. 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.
- H. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- 1. Number of Copies: Submit five copies of each submittal, unless otherwise indicated. Architect will return three copies. Mark up and retain one returned copy as a Project Record Document.
- B. 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 printed data are not suitable 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 written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.

- e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with recognized trade association standards.
 - i. Compliance with recognized testing agency standards.
- C. 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: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 - 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."
- E. Samples: Prepare physical units of materials or products, including the following:
- 1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
 - 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the 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. Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
 - 4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side.

5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

F. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

G. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized 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.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

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

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

I. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. 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.

- J. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- K. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- L. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- M. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- N. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.
- O. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, 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.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. Approved
 - 2. Approved as Noted
 - 3. Not Approved - Resubmit
 - 4. Checked

- C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

- 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 not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, 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, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Ambient conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1.6 QUALITY CONTROL

A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and reinspect corrected work.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field-curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
 2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. See Division 1 Section "Execution Requirements" for progress cleaning requirements.

1.2 USE CHARGES

- A. Water Service: Use water from Owner's existing water system without metering and without payment of use charges.
- B. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.

1.3 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- B. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- C. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water, drinking-water units, including paper cup supply.
 - 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.

- D. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
 - 3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
 - a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
 - 4. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
 - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.
- C. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

- D. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
 - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Project Identification Sign: Prepare Project identification in sizes indicated. Install sign where indicated by Architect to inform public and persons to Project. Do not permit installation of unauthorized signs.
 - 1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
 - 2. Provide one, two-sided sign for each of four facilities.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements " for progress cleaning requirements.
 - 1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
 - 2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.
- D. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of

noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.

- B. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- C. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
 - 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 - 4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selecting products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. See Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.
- C. See Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 2. Completed List: Within 14 calendar days after date of commencement of the Work, submit two copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 3. Architect's Action: Architect will respond in writing to Contractor within 7 calendar days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. 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. Substitution Request Form: Use CSI Form 13.1A.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. 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.
 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 14 calendar days of receipt of request, or 7 calendar days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Change Order.
 - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - 1. Schedule delivery to minimize long-term storage at Project site.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 5. Store products to allow for inspection and measurement of quantity or counting of units.
 - 6. Store materials in a manner that will not endanger Project structure.
 - 7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 9. Protect stored products from damage.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
7. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.
 - a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.

9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within 21 calendar days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
- B. 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:
 1. 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.
 2. Requested substitution does not require extensive revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.
 9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. General installation of products.
 - 2. Progress cleaning.
 - 3. Starting and adjusting.
 - 4. Protection of installed construction.
 - 5. Correction of the Work
- B. See Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect and Owner not less than 48 hours in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Architect's and/or Owner's written permission.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
- F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.5 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of Owner's personnel.
 - 6. Final cleaning.
- B. See Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
- D. See Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Complete startup testing of systems.
 - 8. Submit test/adjust/balance records.
 - 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 10. Complete final cleaning requirements, including touchup painting.
 - 11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or

will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit two copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element.

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

- a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Note related Change Orders and Record Drawings, where applicable.
- D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
 2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.7 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Provide instructors experienced in operation and maintenance procedures.
 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 3. Schedule training with Owner, through Architect, with at least 14 calendar days' advance notice.
 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

- c. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Sweep concrete floors broom-clean in unoccupied spaces.
 - g. Vacuum carpet and similar soft surfaces, removing debris; shampoo if visible soil or stains remain.
 - h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - i. Remove labels that are not permanent.
 - j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - k. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - l. Replace parts subject to unusual operating conditions.
 - m. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

**SECTION 08430
GLAZED STOREFRONTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: This Section includes, but shall not be limited to, glazed storefront systems to receive glazing, embedded items and connections for attaching systems to building structure as indicated on the Drawings. Systems shall have thermal break materials.

1.2 SYSTEM DESCRIPTION

- A. General: Provide the manufacturer's glazed storefront systems, adapted to the application indicated, and modified as required to comply with performance requirements and materials specified, as demonstrated by testing the manufacturer's corresponding systems according to test methods indicated.
1. Performance Requirements:
 - a. Wind Loads: Provide storefront system, including, but not limited to, anchorage, capable of withstanding wind load design pressures of 20 psf
 - b. Air Infiltration: Not more than 0.060 cfm (0.00003 m³/s) per square foot (0.09 m²) (projected area of module) at 6.24 psf (299 Pa) static air pressure differential, when tested in accordance with ASTM E283.
 - c. Water Leakage: There shall be no uncontrolled water entry at 12 psf (575 Pa) test pressure as defined in AAMA 501.
 - d. Structural Performance: Structural performance shall be based on a maximum allowable deflection of L/175 of the clear span for spans up to 13'-6" (4115 mm) or L/240 of clear span plus 1/4 inch (6 mm) for spans greater than 13'-6" (4115 mm), or an amount that restricts edge deflection of individual glazing lites of glass to 3/4 inch (19 mm), whichever is smaller. The system shall perform to those criteria under the wind load specified for this Project.
 - e. Thermal Cycling: There shall be no buckling, stress on glass, edge seal failure, excess stress on structure, anchors and fasteners, or reduction in performance when tested in accordance with AAMA 501.5 at a temperature range of 0 degrees F (-18 degrees C) to 180 degrees F (82 degrees C).
 - f. Thermal Transmittance: Thermal transmittance due to conduction (Uc) shall not be greater than 0.60 Btu/hour/ft²/°F poured and debridged only (or 0.63 Btu/hour/ft²/°F slotted only) per AAMA 1503. Condensation resistance factor (CRF) shall not be less than 56 poured and debridged only (or 53 slotted only) per AAMA 1503.
 - 1) Azon® Thermal Pocket Lance: A mechanical lock between the polyurethane material and aluminum provided by an approved applicator who shall adhere to strict quality control procedures and testing to qualify for the 10 year warranty against failure of the thermal barrier polymer due to dry shrinkage and fracturing.
 - g. Seismic Cycling: There shall be no life/safety type failures (glass breakage, anchor failures, structural damage, etc.) when tested in accordance with AAMA 501.4, seismic test (lateral cycling).
 - h. Sound Rating: The system shall have a sound transmission class (STC) rating of 32 and an outdoor-indoor transmission class (OITC) rating of 26 when tested in accordance with ASTM E90, ASTM E413 and ASTM E1332.

1.3 SUBMITTALS

- A. General: See Section 01 33 00 - Submittal Procedures.
1. Product Data: Submit product data showing material proposed.
 2. Shop Drawings: Submit shop drawings for each product and accessory required.
 3. Samples: If colors not preselected or scheduled, submit samples for initial color selection. Submit samples for verification purposes.

- B. Operation and Maintenance Manuals: Furnish complete operation and maintenance manuals describing the materials, devices, and procedures to be followed in operating, cleaning, and maintaining the work.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Product specified is "T14000 Series Storefront" as manufactured by Tubelite, Inc. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by listed manufacturers are acceptable:
- EFCO
 - KAWNEER
- The Architect will be the sole judge of the basis of what is equivalent. Product shall be American-made.

2.2 MATERIALS

- A. Materials:
1. Aluminum: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required.
 - a. Recycled Content: For all aluminum extrusions except those required for doors and door frames, provide manufacturer's proprietary product fabricated of aluminum with a recycled content of more than 70 percent ("Ecoluminum," Tubelite, Inc.).
 2. Steel Plates, Shapes, and Bars: ASTM A36/A36M, galvanized in accordance with ASTM A123/A123M. If galvanizing is not compatible with alloy of component parts, apply heavy coating of epoxy paint where necessary to prevent galvanic action with dissimilar materials.
 3. Fasteners and Anchors: Provide manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
 4. Inserts: Provide galvanized steel or cast iron inserts of suitable design and adequate strength for condition of use.
 5. Galvanizing Repair Paint: Provide high zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with SSPC Paint 20.
 6. Bituminous Paint: Provide cold-applied asphalt mastic, containing no asbestos fibers.
 7. Size: 2" x 4-1/2"
 8. Glass: 1" IG Unit

2.3 FABRICATION

- A. Carefully fit and match work with continuity of line and design. Rigidly secure members with hairline joints, unless otherwise indicated. Reinforce members and joints with steel plates, bars, rods, or angles for rigidity and strength as needed to fulfill performance requirements.
1. Glazing: Fabricate framing for exterior glazing at spandrels and interior glazing at other openings.
 2. Weeps and Flashings: Fabricate the system so as not to require additional weeps or flashing beyond that which is integral to the system.
 3. Fasteners: Conceal fasteners unless otherwise indicated. For exterior systems use fasteners for joints which cannot be welded.
 4. Dissimilar Materials: Separate dissimilar materials with a heavy coating of epoxy paint or other suitable permanent separation as required to prevent galvanic action.

2.4 FINISHES

- A. General: Comply with NAAMM MFM for recommendations relative to application and designation of finishes. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
- B. Aluminum Finish
 - 1. Class I Color Dark Bronze Anodized Finish

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
 - 1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 PREPARATION

- A. Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, etc., that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project site.

3.3 INSTALLATION

- A. General: Installation shall be in accordance with reviewed product data, final shop drawings, the manufacturer's specifications and recommendations, and as indicated on the Drawings.
 - 1. Erection Tolerances: Comply with manufacturer's published instructions.

3.4 ADJUSTING AND CLEANING

- A. Touch-Up Painting: Immediately after installation, touch-up scratched, nicked, abraded, chipped, or otherwise damaged areas of the finish so as to be unnoticeable.
- B. Cleaning: Wash to remove mortar, plaster, sprayed fire-resistive material, and any other deleterious material from finished surfaces immediately.

3.5 DEMONSTRATION

- A. Maintenance Instructions: Instruct the Owner's personnel who will be responsible for window washing after the time of final acceptance.

3.6 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the glazed storefronts shall be without damage at time of Substantial Completion.

END OF SECTION

**SECTION 08520
ALUMINUM WINDOWS**

GLASS & GLAZING BASE BID (Sliders)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. All exterior Architectural Performance Class (AW) windows furnished and installed as shown on drawings, specified in this section and designated in AAMA/WDMA/CSA 101/I.S.2/A440.
2. All labor, materials, tools, equipment and services needed to furnish and install AW Class windows.
3. Components furnished with installed windows.
4. Installation accessories furnished and installed.

1.02 REFERENCE

- A. Refer to NAFS-2008 for a complete list of references and industry standards.

1.03 SYSTEM DESCRIPTION AND PERFORMANCE REQUIREMENTS

A. Design Wind Loads

1. The design wind pressure for the project will be:
 - a. 20 psf positive and negative; 25 psf negative at corner zones
2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.03.B.

B. Air, Water and Structural Performance Requirements

1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 100 (AW100) unless otherwise noted herein.
 - a. Test units shall not be smaller in either width or height than the "Gateway Test Size" specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
 - b. "Downsize" testing to meet Optional Performance Class requirements specified herein shall not be permitted.
 - c. Test units shall employ manufacturer's standard sealing, lock spacing and anchorage.
2. Air Test Performance Requirements
 - a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.
3. Water Test Performance Requirements
 - a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547.
4. Structural Test Performance Requirements
 - a. Uniform Load Deflection Test
 - i. No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accord with ASTM E330.
 - b. Uniform Load Structural Test
 - i. Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.

- ii. No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.
- C. Life Cycle Testing
 - 1. When tested in accordance with AAMA 910, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.
 - a. Air infiltration and water resistance tests shall meet the primary performance requirements specified after completion of 2500 operational cycles and misuse testing.
- D. Condensation Resistance and Thermal Transmittance Performance Requirements
 - 1. Perform thermal tests in accordance with NFRC 102 and AAMA 1503, or provide finite element computer thermal modeling and calculations per NFRC 100 or AAMA 507, using DOE/LBL THERM 5.2 and WINDOW 5.2 software.
 - a. Thermal Transmittance (U-Factor) for the overall window area shall be less than or equal to .45 BTU/hr-ft²-°F.
 - b. Condensation Resistance Factor (CRF) requirements: CRF minimum 58 (Frame) and CRF minimum 65 (Glass).
 - c. Solar Heat Gain Coefficient (SHGC) for the overall window area shall not exceed .45.
- E. Acoustic Performance Requirements
 - 1. Perform acoustical tests in accordance with ASTM E90 and ASTM E1425 on the glass type(s) specified in 08 80 00, rigidly supported in aluminum framing of the same product family.
 - 2. "Glass-only" test results shall not be acceptable.
 - 3. Sound Transmission Class (STC) shall not be less than 31.
 - 4. Outdoor-Indoor Transmission Class (OITC) shall not be less than 25.

1.04 SUBMITTALS

- A. General Requirements
 - 1. Provide all submittals in a timely manner to meet the required construction completion schedule.
- B. Shop Drawings
 - 1. Shop drawings must be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer. Shop drawings for pre-engineered configurations may be prepared by authorized installers.
 - 2. Provide design details along with bid proposals to define system aesthetic and functional characteristics.
 - 3. Provide up to three photocopied sets of shop drawings, including half size details of all necessary conditions.
- C. Samples
 - 1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
 - 2. Finish: Submit color samples for Architect's approval as requested.
- D. Test Reports and Calculations
 - 1. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.03.
 - 2. Submit structural calculations prepared by a Registered Professional Engineer indicating adequacy of all materials furnished under this section, to meet the uniform and structural load requirements as specified in 1.03.

3. Submit certified independent laboratory test reports from an AAMA-accredited test laboratory verifying compliance with all test requirements of 1.03, including confirmation of ADA accessibility per AAMA 513-12.

1.05 QUALITY ASSURANCE

- A. Qualifications: Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.
- B. In-Plant Testing: Conduct detailed quality audits and ASTM E331 static water infiltration testing on a minimum of 4% of factory-glazed windows prior to shipping, subject to reasonable unit size restrictions.
 1. Each tested unit shall be identified with a removable sticker on the inside glass face.
 2. Provide detailed documentation of in-plant testing upon request.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Packing, Shipping, Handling and Unloading
 1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.07 WARRANTY

- A. Aluminum Window Warranty
 1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
 2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
 3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.
- B. Installation: Submit a written warranty, executed by the window installer, for a period of 1 year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
 1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer
 1. Drawings and specification are based on:
 - a. Wausau Window and Wall Systems – 4100i-HS Double Slide & Fixed Windows.
 2. Approved Equals:
 - a. TRACO window series AA 5450
 - b. EFCO window series SX45

2.02 MATERIALS

- A. Aluminum Framing Members
 1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary non-radius components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for anchor components; all meeting the requirements of ASTM B221.

2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
3. Principal window frame members will be a minimum 0.060" in thickness except at frame sills, which will be 0.080" minimum thickness.
4. Extruded or formed trim components will be a minimum 0.060" in thickness.
5. Frame depth 4 ½" *minimum for 4100i-HS Double Slide.*
6. Sills shall be sloped. Sill must allow for drainage to the exterior.
7. Sash must be tubular, and removable to the interior for cleaning or maintenance.
8. Frames to be designed for self-mulling (stacking), as well as incorporation of integral single-frame transom and spandrel lites.
9. Screen frame must not protrude from exterior of window frame.

2.03 COMPONENTS

A. Hardware

1. All attachment fasteners to be 300 Series stainless steel.
 - a. Other steel components shall be protected by corrosion resistant coatings meeting the requirements of AAMA 907.
2. Extruded aluminum components 6063-T5 or -T6.
3. Locking handles, bases and strikes to be die cast, white bronze, aluminum, or stainless steel in manufacturer's standard surface finish.
4. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.
5. Hardware to be occupant-operated.
- 6.

B. Sealants

1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass

1. Provide in accordance with Section 08 80 00.
2. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.
3. All windows shall consist of ¼" glass ½" air space x ¼" glass makeup 1" IG unit. All glass to be tempered.
4. SB60 Low E (or equal)

D. Glazing

1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
2. Provide windows factory-glazed wherever practical.

E. Glazing Materials

1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Steel Components

1. Provide steel reinforcements as necessary to meet the performance requirements of 1.03.

2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with TGIC powder coating, or rust-inhibitive primer complying with Federal Specification TT-P-645B.

G. Receptors:

1. Provide extruded aluminum receptors to receive windows, as shown on architectural drawings.
2. Finish to match window frames.

H. Insect Screens:

1. Tubular extruded aluminum frames shall meet the requirements of ANSI/SMA 1004.
2. Screen frame finish to match window frames.
3. Aluminum cloth shall comply with GSA-FS-RR-W-365 and USDC-CS-138 with 18 x 16 mesh.
4. Cloth mesh color shall be bright or charcoal mesh.
5. Flat screen on the exterior
6. Screens shall be provided for all openings.

2.04 FABRICATION

A. General:

1. Finish, fabricate and shop assemble frame and sash ventilator members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings shall impair independent frame movement, or bridge the thermal barrier, unless such bridging was also present in thermal test units and thermal models.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 °F to +180 °F.

B. Frames:

1. Cope and mechanically fasten each corner, or miter then mechanically stake over a solid extruded aluminum corner block or weld each corner; then seal weather tight.
2. Make provisions for continuity of frame joinery seals at extrusion webs.

C. Main Sash Ventilator

1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy, leaving hairline joinery, then sealed weather tight.
2. Make provisions for continuity of sash ventilator joinery seals at extrusion webs.

D. Hardware:

1. Locks
 - a. Die cast, lacquered or e-coated white bronze, or stainless steel keepers for manual operation shall secure sash in closed position.
 - b. Provide locks for ventilators at maximum 40" spacing; 50" for single operator multi-lock hardware.
 - c. Provide double grip hardware activated by a lower device for locks exceeding 6'-0" from floor.
2. Limited Opening Device (except egress windows)
 - a. Provide concealed device to limit initial sash operation to 4".
 - b. Operation past this point to be by use of a tool or removable key.
3. Exposed Hinges
 - a. Provide two (2) five-knuckle aluminum nylon-bushed hinges with coated stainless steel pins.
 - b. Provide three (3) hinges on units over 4'-0" high.
 - c. Finish of extruded aluminum hinge leaves and covers shall match window finish.
4. Egress Provisions and Egress Hardware
 - a. Make provisions for egress in case of emergency at windows as indicated on drawings. One opening per classroom must be egress.
 - b. Affix aluminum egress tags to windows indicated.

E. Thermal Break Construction:

1. Continuous extruded polyamide with 25% glass fiber reinforcing, mechanically crimped into cross-knurled cavities.
2. Minimum thermal separation ¼".
3. Quality assurance records must be maintained and available as requested.

F. Weather-stripping:

1. Bulb- or fin-type neoprene, EPDM, dual-durometer PVC, polypropylene, TPE, or other suitable material as tested and approved by the window manufacturer.
2. Miter, crowd, stake or join at corners. Provide drainage to exterior as necessary.
3. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

2.05 FINISHES

A. Finish of Aluminum Components

1. Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown.

Designation	Description	Standard	Color
AAM10C21A44	Electrolytically Deposited Class I Eco-friendly etch	AAMA 611	Dark Bronze

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions

1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows

1. Install all windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
2. Vent windows must be installed, and remain, plumb, square and level, to one-half of the unit shimming tolerances cited in the AAMA Commercial Window and Door Installation Manual, for proper weathering and operation. Installer to make necessary final hardware adjustments on site.
3. Accessible operating vents will require additional care in installation, final adjustment and maintenance to achieve and maintain compliance.
4. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material.

END OF SECTION

**SECTION 08520
ALUMINUM WINDOWS**

GLASS & GLAZING BASE BID ALTERNATE (Casements)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. All exterior Architectural Performance Class (AW) windows furnished and installed as shown on drawings, specified in this section and designated in AAMA/WDMA/CSA 101/I.S.2/A440.
2. All labor, materials, tools, equipment and services needed to furnish and install AW Class windows.
3. Components furnished with installed windows.
4. Installation accessories furnished and installed.

1.02 REFERENCE

- A. Refer to AAMA/WDMA/CSA 101/I.S.2/A440 for a complete list of references and industry standards.

1.03 SYSTEM DESCRIPTION AND PERFORMANCE REQUIREMENTS

A. Design Wind Loads

1. The design wind pressure for the project will be:
 - a. 20 psf positive and negative; 25 psf negative at corner zones
2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.03.B.

B. Air, Water and Structural Performance Requirements

1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 100 (AW100) unless otherwise noted herein.
 - a. Test units shall not be smaller in either width or height than the "Gateway Test Size" specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
 - b. "Downsize" testing to meet Optional Performance Class requirements specified herein shall not be permitted.
 - c. Test units shall employ manufacturer's standard sealing, lock spacing and anchorage.
2. Air Test Performance Requirements
 - a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.
3. Water Test Performance Requirements
 - a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547.
4. Structural Test Performance Requirements
 - a. Uniform Load Deflection Test
 - i. No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accord with ASTM E330.
 - b. Uniform Load Structural Test
 - i. Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.
 - ii. No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

- C. Life Cycle Testing
 - 1. When tested in accordance with AAMA 910, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.
 - a. Air infiltration and water resistance tests shall meet the primary performance requirements specified after completion of cycling.
- D. Condensation Resistance and Thermal Transmittance Performance Requirements
 - 1. Perform thermal tests in accordance with NFRC 102 and AAMA 1503, or provide finite element computer thermal modeling and calculations per NFRC 100 or AAMA 507, using DOE/LBL THERM 5.2 and WINDOW 5.2 software.
 - a. Thermal Transmittance (U-Factor) for the overall window area shall be less than or equal to .45 BTU/hr-ft²-°F.
 - b. Condensation Resistance Factor (CRF) requirements: CRF minimum 58 (Frame) and CRF minimum 65 (Glass).
 - c. Solar Heat Gain Coefficient (SHGC) for the overall window area shall not exceed .45.
- E. Acoustic Performance Requirements
 - 1. Perform acoustical tests in accordance with ASTM E90 and ASTM E1425 on the glass type(s) specified in 08 80 00, rigidly supported in aluminum framing of the same product family.
 - 2. "Glass-only" test results shall not be acceptable.
 - 3. Sound Transmission Class (STC) shall not be less than 31.
 - 4. Outdoor-Indoor Transmission Class (OITC) shall not be less than 25.

1.04 SUBMITTALS

- A. General Requirements
 - 1. Provide all submittals in a timely manner to meet the required construction completion schedule.
- B. Shop Drawings
 - 1. Shop drawings must be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer. Shop drawings for pre-engineered configurations may be prepared by authorized installers.
 - 2. Provide design details along with bid proposals to define system aesthetic and functional characteristics.
 - 3. Provide up to three photocopied sets of shop drawings, including half size details of all necessary conditions.
- C. Samples
 - 1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
 - 2. Finish: Submit color samples for Architect's approval as requested.
- D. Test Reports and Calculations
 - 1. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.03.
 - 2. Submit structural calculations prepared by a Registered Professional Engineer indicating adequacy of all materials furnished under this section, to meet the uniform and structural load requirements as specified in 1.03.
 - 3. Submit certified independent laboratory test reports from an AAMA-accredited test laboratory verifying compliance with all test requirements of 1.03, including confirmation of ADA accessibility per AAMA 513-12.

1.05 QUALITY ASSURANCE

- A. Qualifications: Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.
- B. In-Plant Testing: Conduct detailed quality audits and ASTM E331 static water infiltration testing on a minimum of 4% of factory-glazed windows prior to shipping, subject to reasonable unit size restrictions.
 - 1. Each tested unit shall be identified with a removable sticker on the inside glass face.
 - 2. Provide detailed documentation of in-plant testing upon request.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Packing, Shipping, Handling and Unloading
 - 1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.07 WARRANTY

- A. Aluminum Window Warranty
 - 1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
 - 2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
 - 3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.
- B. Installation: Submit a written warranty, executed by the window installer, for a period of 1 year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
 - 1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer
 - 1. Drawings and specification are based on:
 - a. Wausau Window and Wall Systems – 4250i INvent Series Fixed and Casement Windows.
 - 2. Approved Equals:
 - a. TRACO window series TR-719
 - b. EFCO window series 2900

2.02 MATERIALS

- A. Aluminum Framing Members
 - 1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
 - 2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
 - 3. Principal window frame and sash ventilator members will be a minimum 0.125" in thickness at hardware mounting locations.
 - 4. Extruded or formed trim components will be a minimum 0.060" in thickness.
 - 5. Frame depth 4 ½ " minimum.

6. Sash ventilator sections must be tubular, and close flush with adjoining frame surfaces at interior and exterior.
 - a. Overlap sash ventilators will not be accepted.

2.03 COMPONENTS

A. Hardware

1. All steel components including attachment fasteners to be stainless steel except as noted.
2. Extruded aluminum components 6063-T5 or -T6.
3. Locking handles, bases and strikes to be die cast, white bronze or stainless steel.
4. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.
5. Hardware to be occupant-operated and include: extruded aluminum butt hinges, roto-operators.

B. Sealants

1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass

1. Provide in accordance with Section 08 80 00.
2. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.
3. All windows shall consist of 1/4" glass 1/2" air space x 1/4" glass makeup 1" IG unit. All glass to be tempered.
4. SB60 Low E (or equal)

D. Glazing

1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
2. Provide windows factory-glazed wherever practical.

E. Glazing Materials

1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Steel Components

1. Provide steel reinforcements as necessary to meet the performance requirements of 1.03.
2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with TGIC powder coating, or rust-inhibitive primer complying with Federal Specification TT-P-645B.

G. Receptors:

1. Provide extruded aluminum receptors to receive windows, as shown on architectural drawings.
2. Finish to match window frames.

H. Insect Screens:

1. Tubular extruded aluminum frames shall meet the requirements of ANSI/SMA 1004.
2. Screen frame finish to match window frames.
3. Aluminum cloth shall comply with GSA-FS-RR-W-365 and USDC-CS-138 with 18 x 16 mesh.

4. Cloth mesh color shall be bright or charcoal mesh.
5. Fixed screens on all roto-operated casements.

2.04 FABRICATION

A. General:

1. Finish, fabricate and shop assemble frame and sash ventilator members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings shall impair independent frame movement, or bridge the thermal barrier, unless such bridging was also present in thermal test units and thermal models.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 °F to +180 °F.

B. Frames:

1. Cope and mechanically fasten each corner, or miter then mechanically stake over a solid extruded aluminum corner block or weld each corner; then seal weather tight.
2. Make provisions for continuity of frame joinery seals at extrusion webs.

C. Main Sash Ventilator

1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy, leaving hairline joinery, then sealed weather tight.
2. Make provisions for continuity of sash ventilator joinery seals at extrusion webs.

D. Hardware:

1. Locks
 - a. Die cast, lacquered or e-coated white bronze, or stainless steel keepers for manual operation shall secure sash in closed position.
 - b. Provide locks for ventilators at maximum 40" spacing; 50" for single operator multi-lock hardware.
 - c. Provide double grip hardware activated by a lower device for locks exceeding 6'-0" from floor.
2. Limited Opening Device (except egress windows)
 - a. Provide concealed device to limit initial sash operation to 4".
 - b. Operation past this point to be by use of a tool or removable key.
3. Exposed Hinges
 - a. Provide two (2) five-knuckle aluminum nylon-bushed hinges with coated stainless steel pins.
 - b. Provide three (3) hinges on units over 4'-0" high.
 - c. Finish of extruded aluminum hinge leaves and covers shall match window finish.

E. Thermal Break Construction:

1. Continuous extruded polyamide with 25% glass fiber reinforcing, mechanically crimped into cross-knurled cavities.
2. Minimum thermal separation ¼".
3. Quality assurance records must be maintained and available as requested.

F. Weather-stripping:

1. Bulb- or fin-type neoprene, EPDM, dual-durometer PVC, polypropylene, TPE, or other suitable material as tested and approved by the window manufacturer.
2. Miter, crowd, stake or join at corners. Provide drainage to exterior as necessary.
3. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

2.05 FINISHES

A. Finish of Aluminum Components

1. Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown.

Designation	Description	Standard	Color
AAM10C21A44	Electrolytically Deposited Class I Eco-friendly etch	AAMA 611	Dark Bronze

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions
 1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
 2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Erection of Aluminum Windows
 1. Install all windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
 2. Vent windows must be installed, and remain, plumb, square and level, to one-half of the unit shimming tolerances cited in the AAMA Commercial Window and Door Installation Manual, for proper weathering and operation. Installer to make necessary final hardware adjustments on site.
 3. Accessible operating vents will require additional care in installation, final adjustment and maintenance to achieve and maintain compliance.
 4. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material.

END OF SECTION