

SECTION 01030

CONSTRUCTION OPERATIONS AND SITE UTILIZATION PLAN

PART 1 - GENERAL

1.1 SUMMARY

- A. The Construction Operations Plan provides a coordinated construction environment to ensure an orderly, secure and safe operation within the existing school and the entire school property, consequently forming the basis for the Site Utilization Plan prepared by the General Contractor.
- B. The Board Authorized Representative and the Building Engineer will administer the operations plan activities. All Construction Operating issues will be channeled through and require approval by the Board Authorized Representative and/or the Building Engineer and Principal.
- C. The Construction Operations Plan has been prepared based on the requirements of the project and in coordination with the existing school operations and program. The elements of this plan required for incorporation into the Site Utilization Plan are included in this section.

1.2 RELATED SECTIONS

- A. Refer to the General Contractor's Service Agreement for information related to this section. Additional Specification Sections containing information that relate to this section include:
 - 1. Selective Demolition: Section 02070.

1.3 GENERAL REQUIREMENTS

- A. General Contractor shall review and be familiar with the site conditions through site visits.
- B. General Contractor to provide all temporary and permanent driveway apron and alley permits for the duration of the construction if required. The General Contractor is to pay all fees required for processing permits and is to contact and comply with all authorities and jurisdiction required for permitting.
- C. General Contractor will provide snow removal and clear all debris in construction area and construction access drives and walks.
- D. General Contractor is to provide all required permits for street access for truck delivery from the local and state jurisdiction.
- E. The General Contractor will be required to coordinate all phases of construction and complete the work within the Milestone completion date(s) for the work. The General Contractor shall be also held responsible for meeting all related provisions as described within this section.
- F. Upon issuance of the Notice to Proceed (NTP) the General Contractor shall survey the site and photograph the area of construction operations and surrounding areas. Upon completion of the work the Contractor is to restore the areas to the documented condition prior to the start of work or as otherwise indicated in the Contract Documents.
- G. General Contractor is to replace all removed trees, bushes, ground covers and grass on the Chicago Public Schools' property used as part of the construction operations. Also concrete pavement walks and asphalt

surfaces will be replaced or restored to same or improved condition prior to construction.

- H. **General Contractor shall coordinate work with School during yearly Mandatory State Testing periods. Test dates should be verified in preparation of the Contractors Schedule. No work will be permitted in the existing facility or on the construction site during testing except as specifically approved by PBC's Authorized Commission Representative, in conjunction with the CPS, school Principal, and Building Engineer.** If the General Contractor secures approval for specific work to be executed in designated areas during testing periods, the General Contractor must minimize noise in these areas during these time periods, and if requested by the School, stop work causing the noise until testing is completed. General Contractor shall account for in his bid and bear all costs for any loss of time or production related to Mandatory State Testing. The State Testing Dates for the 2011 academic years as follows: February 28, 2011 through March 11, 2011.
- I. General Contractor will coordinate and maintain all exit egress during construction as required by the City of Chicago code, other entities with jurisdiction, and as directed by the PBC's Authorized Commission Representative in conjunction with the CPS. The General Contractor shall provide and maintain all materials and labor including barricades, construction fence, doors, partitions, and fire rated walls as required for safe egress, including any shared egress with school during construction.

PART 2 - PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.1 SITE UTILIZATION PLAN

- A. After Notice of Award and prior to the issuance of the Notice to Proceed the General Contractor is to prepare and submit to the PBC's Authorized Commission Representative for approval a Preliminary Site Utilization Plan based on the Construction Operations requirements outlined in this section. Mobilization on-site is not to occur until approval of the Site Utilization Plan is obtained. If requested by the Contractor, a preliminary meeting to review site elements and Construction Operations with the PBC and CPS staff prior to submission of the Site Utilization Plan will be held at the site.
- B. The Site Utilization Plan shall be submitted within 15 calendar days of issuance of the NTP and shall be provided in a full-size graphic drawing format (30" x 42"). The final Site Utilization Plan must be approved before any direct construction activities take place on the site. Provide a separate plan for the site and for each floor of the existing building where work is being performed. The Contractor is required to prepare and secure approvals of a separate Site Utilization Plan for each phase of the work. Modifications to the format and sheet size will be permitted if pre-approved by the PBC's Authorized Commission Representative and if proposed modifications will facilitate preparation, presentation and review of the Site Utilization Plan. Electronic copies of the Contract Document drawings as appropriate will be provided for this purpose upon request. The Site Utilization Plan shall at a minimum include the following elements:
1. Title block information including School Name, Contract Number, General Contractor, Building floor/level information, construction phasing, and current plan date.
 2. All denotations shall be illustrated in a Legend on each construction phasing plan.
 3. Building footprint of both new and existing buildings, trees, landscaping, paving, drainage structures, existing and ornamental fencing and other important site features.
 4. Areas of staging for construction, students and staff, student drop-off points, existing school

- entrances and exits, student and staff parking areas, construction parking, and traffic patterns for both construction and non-construction vehicles.
5. Denotation of the limits of construction and required construction fencing including any existing fencing to remain.
 6. Denotation of temporary signage, temporary stock pile, temporary stocked material and temporary sump pump.
 7. Denotation of required covered construction barricade walkways, and crane locations.
 8. Denotation of areas allowed for staging purposes: construction personnel parking, material storage, and construction trailer(s). Such activities are to only take place in areas designated and approved by the PBC's Authorized Commission Representative in conjunction with the CPS and School Principal.
 9. Denotation of any specific site conditions required to be observed such as keeping alleys clear next to adjacent properties, and any other issues listed on the Construction Operations Site Plan.
 10. Denotation of areas allowed for site access gates, trailers, wheel washers, storage and existing utility poles.
 11. Denotation of all required temporary utilities, including but not limited to AT&T, Peoples Gas, and ComEd.
 12. Denotation of areas of work within the existing building for the period of time covered by the Site Utilization Plan, coordinated with the Project Schedule. Each area should indicate planned beginning and end dates for work in that area. Areas where all work is completed are to be noted.
 13. Construction worker ingress/egress, material staging and mock-up areas in the existing building and construction areas.
 14. Proposed locations of temporary protection, barricades, and temporary walls within the existing building.
 15. Denotation of all temporary exits and path of travel by pedestrians and vehicular traffic.
 16. Denotation of construction limits by phase and area with commencement and completion dates for each.
 17. Note the time and location of any system tie-ins to existing services, including but not limited to water, sewer, power, controls, security, and HVAC.

3.2 SITE UTILIZATION PLAN UPDATES

- A. The General Contractor is required to submit for approval updated Site Utilization Plans whenever conditions in the current approved plan have changed. Approval is required prior to proceeding on any changed conditions not previously approved. Requirements for updating include the following:
 1. In coordination with the project schedule provide detailed information regarding work in the existing building including phasing, vacation of existing in-use areas, and any other information requested by the OR, Principal, or Building Engineer.
 2. Revision to the site plan to reflect changing conditions regarding construction fencing, ingress and egress, student and staff staging, construction deliveries, areas of stored materials, parking, and any other construction facility revisions.
 3. The Contractor is required to prepare and secure approval of a separate site utilization plan for this Phase of the work.

3.3 CONSTRUCTION OPERATIONS PLAN

A. Construction Phasing: In order to minimize disruption to school operations, the project shall be completed in multiple Phases, with each Phase containing different components of the project. These Phases include: Phase IA – Construction Preparation Phase by Others. Phase IIA- South Modular Classroom Work and Existing Building Interior Work, Phase IIB – New 2 Story Addition and Existing School Building Interior Renovations and Site Improvements South & East of the School Building, Phase III Site Improvements North & West of the School Building. Listed below is a summary of these Phases, along with durations for each.

1. Construction Preparation Phase (By Others.)

- This Phase includes all Work associated with: Zone A- the Installation of new North 4-Classroom Modular Structure; Zone B- Removal of South 4-Classroom Modular Structure, Play lot removal, Backstop removal, Tree protection, Construction Fence installation temporary walk construction.
- All Site Preparation Work within the limits of the Construction Preparation Phase Zone B area shall be completed by July 9th 2010.
- All Site Preparation Work within the limits of the Construction Preparation Phase Zone A area shall be completed by August 18th 2010.

2. Construction Phase II-A

- This Phase includes all Work associated with: the Demolition & removal of the south modular Classroom Structure CMU skirt wall, foundation, footings and utility connections; Securing the elevator wing for limited access by school (1st & 2nd Floors); Replacement of fire alarm system in the existing building; Installation of new low voltage utility systems in the existing building.
- All Work associated with the interior renovations of the existing school building shall commence and be completed during the summer recess periods only. No work will be permitted during the 2010 and 2011 school sessions. Contractor must obtain written approval from the Commission for performing any work during any other holiday breaks. All Work associated with the interior renovations, including upgrades to the existing MEP, Fire Alarm system, shall commence upon issuance of the NTP through August 13, 2010, and from June 20, 2011, and be completed by no later than August 12, 2011.

3. Construction Phase II-B

- This Phase includes all Work associated with: the New 2 Story Building Addition Construction; New transformer installation with enclosure foundation and pad construction; Partial Completion of Site Improvements - (South playfield, Back Stop, Playground, Landscaping) and North East Site Restoration including removal of tree protection fencing, new walkway construction and temp. walk removal.
- All Work associated with the construction of the New 2 Story Addition, exterior demolition, required remediation, upgrade to existing Fire Alarm system, new generator, utilities and Zone A landscaping & site work shall be completed within 365 calendar days of issuance of the NTP.
- Utility shut-offs will only be permitted after regular school hours from Friday 6:00pm through Monday 7:00am. All utility shut-offs require written approval of the PBC's Authorized Commission Representative in conjunction with the CPS.

4. Construction Phase III

- This Phase includes all Work associated with: the Utility disconnection by General Contractor; Completion of trash area construction; Demolition both modular classroom footings and foundations and utilities; Completion of North West Parking Area Construction, site improvements and landscaping; completion of all remaining Site Improvements.
- The removal of north modular classroom structure by others.
- The removal of south CPS owned south modular classroom structure and the Utility disconnection by Others.

- All Work for Phase III shall commence June 20, 2011, and be completed within 410 calendar days of issuance of the NTP.
 - Removal of the modular classroom as per the drawings and specifications within the limits of the Phase III area shall be by others and be completed by June 30, 2011.
5. The Contractor is to set up and stage the entire project within the boundaries of the construction fence. The General Contractor is responsible for maintaining and modifying the fence as necessary and as approved in the Site Utilization Plan for the life of the project. Removal and disposal of the fence at the conclusion of the project is the responsibility of the General Contractor
- a. The Contractor is required to prepare and secure approvals of a separate Site Utilization Plan for each phase of the work.
 - b. All provisions of the Contract Documents and Specifications will remain in effect throughout each phase of the project.

B. Site Restrictions

1. No construction deliveries during school days will be permitted to either the existing facility or the new additions between the hours of 7:00 to 9:00 AM and 2:00 to 4:00 PM.
2. Upon issuance of the Notice to Proceed (NTP), the Contractor is to set up and stage the entire project within the boundaries of the existing construction fence. The General Contractor is responsible for maintaining and modifying the fence as necessary and as approved in his Site Utilization Plan for the life of the project. Removal and disposal of the fence and restoration of area damaged by fencing at the conclusion of the project is also the responsibility of the General Contractor.
3. Organization of the work and facilities within the construction fence and as otherwise noted above will be the sole responsibility of the General Contractor. However, temporary facilities that produce noise and/or dust are to be located as far as possible from the existing building. The PBC in conjunction with the CPS can require relocation of any facility that disrupts normal school operation. General Contractor shall provide dust control and continuous street cleaning at streets surrounding project site to remediate dirt and construction debris from construction activities.
4. Delivery and construction access to the site will be determined by the site utilization plan. Subject to City requirements, worker parking will be allowed on the street only. The deliveries and construction access to the site is to be implemented in accordance with the Approved Site Utilization Plan. There will be no parking on-site outside of the Contractor's fenced work area on school days. Parking priority is for school staff and students at all times. Modifications to parking restrictions stated herein will be made if required to maintain this priority.

C. Access to work in the Existing Building.

1. The General Contractor will be allowed access to the work in the existing building only as previously approved through the project schedule and Site Utilization Plan.
2. Exterior work on the existing building can be conducted during school hours and as approved in the Site Utilization Plan, however, dust, noise, and odor infiltration into the existing building will not be permitted under any circumstances. Notwithstanding approval of the Site Utilization Plan, the Contractor will be required to immediately cease or relocate operations whenever these activities conflict with the school learning environment.
3. There will be no summer school session at the Sauganash Elementary School in 2010 and 2011, allowing less restrictive access to the existing building. Faculty and staff may occupy portions of the existing building during each summer, and the contractor shall coordinate work to accommodate

school representatives during this these summer periods. Site Utilization Plan requirements however, will remain in effect as modified and approved for the unoccupied period. All requirements of the Contract Documents will remain in effect with the exception of those requirements that serve the exclusive purpose of coordination with student activities at the school.

4. The PBC in conjunction with the CPS, School Building Engineer and/or other approved CPS staff are required to be present at all times work is in progress in the existing Building. If advance arrangements are not made with CPS, the General Contractor will be responsible for all overtime costs for the CPS staff member for work outside of normal working hours. Overtime arrangements for CPS staff includes weekends, holidays, and generally hours beyond that listed in Site Restrictions above. IUOE Locals #143 and #399 Holidays are as follows (Saturday holidays are observed on Friday, Sunday holidays are observed on Monday):

- a. New Year's Day
- b. Martin Luther King Jr.'s Birthday
- c. Lincoln's Birthday
- d. Presidents Day
- e. Pulaski Day
- f. Memorial Day
- g. Independence Day
- h. Labor Day
- i. Columbus Day
- j. Veterans Day
- k. Thanksgiving
- l. Friday after Thanksgiving
- m. Christmas Day

END OF SECTION

SECTION 07413

METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Engineering, fabrication and installation of insulated core metal panel system as indicated and as specified.
- B. The materials in this Section are part of the overall USGBC "Leadership in Energy and Environmental Design" LEED prerequisites and credits needed for Project to obtain LEED Silver certification based on LEED for Schools 2007 requirements. See Section 01352 LEED Requirements and this section for more information.

1.2 SUBMITTALS

- A. Product Data: Submit complete printed data on panel system indicating features and products to be provided demonstrating specification compliance.
 - 1. Submit full line color charts for selections by Architect.
- B. Shop Drawings: Submit complete layout and installation drawings indicating method of attachment signed and sealed by a State of Illinois Licensed Structural Engineer.
- C. Coordination Drawings: Exterior elevations, drawn to scale, and coordinating penetrations and wall-mounted items. Show the following:
 - 1. Wall panels and attachments.
 - 2. Stud framing.
 - 3. Wall mounted items including doors, windows, louvers and lighting fixtures.
 - 4. Penetrations of wall by pipes and utilities.
- D. LEED Submittals:
 - 1. Product Data as required to show compliance with the following credits:
 - a. LEED Credit MR 4.1 and Credit MR 4.2: Submit product data for products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
 - 1. Include statement indicating costs for each product having recycled content.
 - b. LEED Credit MR 5.1 and Credit MR 5.2: Submit product data for products that have extracted, harvested, or recovered, as well as manufactured within 500 miles of the Project site.

1. Include a statement indicated the percentage by weight which is extracted, harvested, or recovered within 500 miles of the Project site.
2. See Section 01352 LEED Requirements and this Section for more information. Submit Materials Credit Documentation Sheet attached to Section 01352 for products in this section, including back-up documentation.

1.3 QUALITY ASSURANCE

- A. Fabricator: Experienced in the engineering of the panel system and attachment system.
- B. Installer: Experienced in the installation of the panel system and acceptance to the manufacturer.
- C. Regulatory Requirements: Verify and conform to requirements of authorities having jurisdiction.

1.4 PRE-INSTALLATION CONFERENCE

- A. Conduct a PreInstallation Conference in accordance with Book 2A Section 3.5
 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Review methods and procedures related to metal wall panel installation, including manufacturer's written instructions.
 3. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 4. Review flashings, special details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
 5. Review temporary protection requirements for metal wall panel assembly during and after installation.
 6. Review wall panel observation and repair procedures after metal wall panel installation.

1.5 PERFORMANCE REQUIREMENTS

- A. Water and Air Leakage: Provide systems that have been tested and certified to conform to the following criteria:
 1. Air Leakage: Not more than 0.06 cfm per square foot of wall area, when tested at 1.57 psf in accordance with ASTM E 283.
 2. Water Penetration: No water infiltration under static pressure when tested in accordance with ASTM E331 at a differential of 10% of inward acting design load, 6.24 psf minimum, after 15 minutes.
 3. Water penetration is defined as the appearance of uncontrolled water in the wall.
 4. Wall design shall feature provisions to drain to the exterior face of the wall a leakage of water at joints and any condensation that may occur within the construction.

- B. Structural: Provide systems that have been tested in accordance with ASTM E 330 at a design pressure of 40psf and have been certified to be without permanent deformation of failures of structural members.
 - 1. Deflection Limits: Metal wall panel assemblies shall withstand wind loads with horizontal deflections no greater than 1/240 of the span.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealant, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and night-time sky heat loss.
- D. Thermal Performance: Provide insulated metal wall panel assemblies with thermal-resistance value indicated when tested according to ASTM C518.

1.6 DELIVERY, STORAGE, HANDLING

- A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting or other surface damage.
- D. Retain strippable protective covering on metal wall panels for period of metal wall panel installation.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrications, and indicate measurements on Shop Drawings.

1.8 COORDINATION

- A. Coordinate metal wall panel assemblies with rain drainage work, flashing, trim and construction of studs, soffits, and other adjoining work to provide a leakproof, secure and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to the following:
 - a. Structural failures, including rupturing, cracking or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

- A. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- B. Metallic Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil coating process to comply with ASTM A 755/A 755M.
 - 1. Zinc-Coated (galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
 - 2. Surface; Smooth
 - 3. Exposed Coil Coated Finish - Mica (Pearlescent) Fluoropolymer: AAMA 621. Two coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers written instructions.
 - a. Color: Valspar Corp, Fluropon Classic II "Weathered Zinc SR: 0.25 E: 0:83" as approved by the Architect.

4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wah coat with a minimum total dry film thickness of 0.5 mil.
- C. Panel Sealants; Joint Sealant: ASTM C 920; elastomeric polyurethane, polyfulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.

2.2 INSULATION FOR PANEL CORES

- A. Polyisocyanurate Insulation: Closed cell, modified polyisocyanurate foam using a non-CFC blowing agent, board type, with maximum flame-spread index of 25 and smoke developed index of 450. R: 21.0

2.3 MISCELLANEOUS METAL FRAMING

- A. Miscellaneous Metal Framing, general: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G60 hot-dip galvanized or coating with equivalent corrosion resistance unless otherwise indicated.
- B. Subgirts: Manufacturer's standard C-or Z-shaped sections, 0.064 inch nominal thickness.
- C. Zee Clips: 0.079 inch nominal thickness.
- D. Base or Sill Angles: 0.079 inch nominal thickness.
- E. Hat-Shaped, Rigid Furring Channels:
 1. Nominal Thickness: As required to meet performance requirements.
 2. Depth: As indicated.
- F. Cold-Rolled Furring Channels: Minimum 1/2 inch wide flange.
 1. Nominal Thickness: As required to meet performance requirements.
 2. Depth: As indicated.
 3. Furring Brackets: Adjustable, corrugated edge type of steel sheet with 0.040 inch nominal thickness.
 4. Tie Wire: ASTM A 641/A641M, Class 1 zinc coating, soft temper, 0.062 inch diameter wire, or double strand of 0-048 inch diameter wire.
- G. Fasteners for Miscellaneous Metal Framing: Of type, material, size corrosion resistance, holding power and other properties required to fasten miscellaneous metal framing members to substrates.

2.4 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws; bolts and nuts; self locking rivets and bolts; end-welded studs; and other suitable fasteners designed to withstand design loads. Provide concealed fasteners where possible. When exposed fasteners are required, provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory applied coating; provide EPDM, PVC or neoprene sealing washers.
- B. Isolation Shims: Provide neoprene isolation shims, as recommended by the manufacturer of the wall panels, where indicated.
- C. Weeps: Absorbent rope, made from cotton or UV resistant synthetic fiber, 1/4 to 3/8 inch in diameter, in length required to produce 2 inch (50-mm) exposure on exterior and 18 inches in cavity behind wall panels where indicated.

2.5 LAMINATED-INSULATION-OREMETAL WALL PANELS

- A. General: Provide factory-formed and assembled metal wall panels fabricated from two metal facing sheets and core material laminated or otherwise securely bonded to facing sheets during fabrication without use of contact adhesives, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

1. Panel Performance:

- a. Flatwise Tensile Strength: 27 psi when tested according to STM C 297.
- b. Humid Aging: Volume increase not greater than 6.0 percent and no delamination or metal corrosion when tested for 7 days at 140 deg. F and 100 percent relative humidity according to ASTM D 2126.
- c. Heat Aging: Volume increase not greater than 2.0 percent and no delamination, surface blistering, or permanent bowing when tested for 7 days at 200 deg F according to ASTM D 2126.
- d. Cold Aging: Volume decrease not more than 1.0 percent and no delamination, surface blistering, or permanent bowing when tested for 7 days at minus 20 deg F according to ASTM D 2126.
- e. Fatigue: No evidence of delamination, core cracking, or permanent bowing when tested to a 20 lbf/sq. ft. positive and negative wind load and with deflection of L/180 for 2 million cycles.
- f. Autoclave: No delamination when exposed to 2-psi pressure at a temperature of 212 deg F for 2-1/2 hours.

2. Polyisocyanurate Insulation Core Performance;

- a. Density: 1.8 to 2.3 lb/cu ft. when tested according to ASTM D 1622.

- b. Compressive Strength: Minimum 20 psi when tested according to ASTM D 1621.
 - c. Shear Strength: 24 psi when tested according to ASTM C 273.
- B. Ship-Edge, Laminated-Insulation Core Metal Wall Panels: Formed profiled, accent exterior panel facing and with shiplap edges; designed for sequential installation by mechanically attaching panels to supports using concealed clips and fasteners, with factory applied gaskets in side laps.
- 1. Basis of Design product: Subject to compliance with requirements, provide Centria Insulated Metal Panel "Formawall" 3" Horizontal Flat., or a comparable product by one of the following:
 - a. Centria 3" R21.0 Formawall or approved equal.
 - 2. Exterior Facing:
 - a. Material: Zinc coated (galvanized) steel sheet, 22 gauge, smooth.
 - b. Finish: Mica (Pearlescent) fluoropolymer.
 - 3. Interior Facing:
 - a. Material: Zinc coated (galvanized steel sheet, 24 gauge.
 - b. Surface: Smooth
 - c. Finish: Manufacturer's standard primer or white polyester.
 - 4. Width: As indicated.
 - 5. Core Material: Polyisocyanurate board insulation
 - 6. Clips: Manufacturer's standard one piece, formed from zinc coated (galvanized steel.
 - 7. Gaskets: Extruded, dry seal silicone.
 - 8. Sealant: Manufacturer's standard silicone.
 - 9. Panel Thickness: 3.0 inches.
 - 10. Thermal Resistance Value (R-Value): 21.

2.6 ACCESSORIES

- A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, finished profile panel end caps, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal wall panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 3. Closure Strips: Closed cell, expanded, cellular, rubber or crosslinked, polyolefin foam or closed cell laminated polyethylene; minimum 1 inch thick, flexible closure strips, cut or premolding to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- B. Flashing and Trim: Formed from 0.018 inch minimum thickness zinc coated (galvanized) steel sheet or aluminum zinc alloy coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels.

2.7 FABRICATION

- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- C. Provide panel profile including major ribs and intermediate stiffening ribs, if any for full length of panel.
- D. Fabricate metal wall panel joints with factory installed captive gaskets or separator strips that provide a tight seal and prevent metal to metal contact in a manner that will minimize noise from movements within panel assembly.
- E. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams: Fabricate nonmoving seams in accessories with flat-lock seams.. Tin edges to be seamed, form seams, and solder.
3. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products", for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports and other conditions affecting performance of work.
 1. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 2. Verify that weather resistant sheathing paper has been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 - B. Examine roughing in for components and systems penetrating metal wall panels to verify actual locations of penetration relative to seam locations of metal wall panels before metal wall panel installation.
 - C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Framing; Install subgirts, base angles, sills furring and other miscellaneous wall panel support members and anchorages according to ASTM C 754 and metal wall panel manufacturer's written recommendations.

3.3 METAL WALL PANEL INSTALLATION, GENERAL

- A. General: Install metal wall panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
- B. fasteners: If exterior fasteners are required use color coated stainless steel; use galvanized steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrate, protect against galvanic action as recommended by metal wall panel manufacturer.
- D. Joint Sealers; Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or if not indicated, types recommended by metal wall panel manufacturer.

3.4 INSULATED CORE METAL WALL PANEL INSTALLATION

- A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated core metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.
- B. Laminated Insulation Core Shiplap Edge Metal Wall Panels: Panels Mechanically attach wall panels to supports using staggered, concealed side clips engaging tongue and groove panel edges. Install clips to supports with self tapping fasteners.

3.5 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's 'Architectural Sheet Metal Manual" Provide concealed fasteners

where possible, and set units true to line and level as indicated. Install work with laps, joints and seams that will be permanently watertight and weather resistant.

3.6 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.
- B. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt and sealant.
- C. Replace metal wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 08570

ACCESSIBLE AWNING WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install accessible awning windows complete with push out hardware, glazing, weather stripping, insect screens, simulated divided lites, jamb extensions, specified anchors, trim, attachments and related components as shown on Drawings and specified in this Section.

1.2 REFERENCES

- A. AAMA - American Architectural Manufacturers Association – www.aamanet.org
1. AAMA/WDMA/CSA 101/I.S.2/A440-05 “Standard/Specification for Windows, Doors, and Unit Skylights”
 2. AAMA 502-08 "Voluntary Specification for Field Testing of Newly Installed Fenestration Products"
 3. AAMA 611-98 "Voluntary Specification for Anodized Architectural Aluminum"
 4. AAMA 701/702-04 "Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals"
 5. AAMA 800-07 "Voluntary Specifications and Test Methods for Sealants"
 6. AAMA 904-01 “Voluntary Specification for Multi-Bar Hinges in Window Applications”
 7. AAMA 910-93 “Voluntary ‘Life Cycle’ Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors”
 8. AAMA 1503-98 "Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections"
 9. AAMA 2603-02 “Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels”
 10. AAMA 2604-05 “Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels”
 11. AAMA 2605-05 “Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels”
 12. AAMA CW-10-04 "Care and Handling of Architectural Aluminum from Shop to Site"
- B. ANSI – American National Standards Institute – www.ansi.org
1. ANSI A117.1-03 ” Accessible and Usable Buildings and Facilities Standards”
 2. ANSI Z97.1-04 “American National Standard for Safety Glazing Materials used in Buildings – Safety Performance Specifications and Methods of Test”
- C. ASTM - American Society for Testing and Materials – www.astm.org
1. ASTM E 90-04 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

2. ASTM E 283-04 "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen"
 3. ASTM E 330-02 "Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference"
 4. ASTM E 331-00 "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference"
 5. ASTM E 413-04 Classification for Rating Sound Insulation
 6. ASTM E 547-00 "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference"
 7. ASTM E 2190-02 "Standard Specification for Insulating Glass Unit Performance and Evaluation"
- D. CCMC – City of Chicago Municipal Code - www.amlegal.com/library/il/chicago.shtml
1. CCMC – Chapter 18-11-1109.13.1 - Operable windows.
 2. CCMC – Chapter 18-13 Energy Conservation Code
- E. CPSC - Product Safety Commission - www.cpsc.gov
1. CPSC 16 CFR 1201 "Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials – codified at Title 16, Part 1201 of the Code of Federal Regulations"
- F. GANA – Glass Association of North America – www.glasswebsite.com
1. GANA - "Glazing Manual" 2008
- G. IGCC – Insulating Glass Certification Council – www.igcc.org
- H. NAAMM - National Association of Architectural Metal Manufacturers - www.naamm.org
1. AMP-500-06 "Metal Finishes Manual"
- I. NFRC - National Fenestration Rating Council - www.nfrc.org
1. NFRC -100-04 "Procedures for Determining Fenestration Product U-factors"
 2. NFRC- 300- 04 "Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems"
- J. PEI – Porcelain Enamel Institute - www.porcelainenamel.com
1. PEI - "Porcelain Enamel for Architects, Designers & Construction Specifiers," 2008
- K. SGCC – Safety Glazing Certification Council – www.sgcc.org
- L. WDMA – Window and Door Manufacturer’s Association - www.wdma.com
1. WDMA I.S.4-07A "Water-Repellent Preservative Non-Pressure Treatment for Millwork"
- 1.3 SYSTEM DESCRIPTION
- A. AAMA product designation: AW-PG65-AP

- B. Windows: manufacturer's standard awning windows with a minimum frame depth of 2-1/4 inches with operable sash installed by the manufacturer into frame; equal leg frame; interior and exterior finishes applied by the window manufacturer; frames and vents assembled by the window manufacturer.
- C. Configuration: Match size, shape, proportions and patterns of adjacent windows.
 - a. Project out/awning; overlap vent sash in window configurations indicated on drawings.
 - b. In projects where adjacent windows configuration consists of single hung or double hung sashes: provide a single vent in lower lite and fixed lite in upper frame. Meeting rail dimensions between upper and lower sections to match adjacent window dimensions.
 - c. In projects where adjacent window configuration consists of individual fixed and operable projecting vents: provide single project out awning vent with dimensions matching adjacent operable vents.
- D. Vent glazing: exterior aluminum glazing bead; with thermal glazing bead on interior and exterior perimeter; 1" insulating glass; glazed by the window manufacturer.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide accessible awning windows units that meet or exceed performance requirements specified as confirmed by testing manufacturer's windows that are representative of those specified, and that are of tested to size indicated below.
- B. Performance Class & Grade: All window units installed in project are to conform to AW-PG65-AP specifications of AAMA/WDMA/CSA 101/I.S.2/A440 when tests are performed on a 60" x 36" minimum frame size with the test results as specified below.
 - 1. In cases where window units required exceed test size stated above, test largest sized unit required for project for compliance with specified performance requirements below.
- C. Design Requirements: Provide windows that comply with AAMA 910 life cycle test requirements and meet AAMA/WDMA/CSA 101/I.S.2/A440 standards when tests are performed on a window size matching or exceeding size specified above. Window tests are to be by a recognized Independent Testing Laboratory or Agency, in accordance with ASTM E 283 for air infiltration, and with ASTM E 331 and ASTM E 547 for water penetration.
 - 1. Air Infiltration: of maximum .1 cfm/square foot at a static air pressure difference of 6.24 psf.
 - 2. Water Penetration: no water penetration shall be permitted at a static air pressure difference of 10 psf.
- D. Structural Performance: Provide windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 requirements for Uniform Load Structural Test:
 - 1. Design Wind Loads: Provide windows identical to windows that have been successfully tested to resist design pressure, but not less than the following:
 - a. Pressure: 30 psf in any direction.
 - 2. Uniform Deflection: no more than L/175 when tested per ASTM E 330 at a static air pressure difference of 65 psf.

3. Uniform Structural: Unit is to be tested at 1.5 x design wind pressure, both positive and negative at 97.5 psf in accordance with ASTM E 330. There shall be no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make the window inoperable. There shall be no permanent deformation of any main frame or vent member in excess of 2% of its span.
- E. Installation Performance Requirements:
1. Design the attachment of the windows at jambs, head, and sill and reinforce mullions to resist 30 psf load applied in any direction.
- F. Thermal Movement: Provide windows, including anchorage, that allow for thermal movement resulting from the following maximum range in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change Range: 120 deg F, ambient; 180 deg F material surfaces.
- G. Thermal Performance: Provide windows that comply with energy conservation requirements of CCMC as demonstrated by testing per AAMA 1503.
1. U-Factor: Provide window units having maximum U-factor of 0.45 or better for fixed units and 0.50 or better for operable units as determined in accordance with NFRC 100 by a laboratory accredited by a nationally recognized accreditation organization such as the NRFC and labeled and certified by the manufacturer
 2. Condensation Resistance Factor (CRF): Minimum CRF to be 50 or better for frame and 60 or better for glass.
 3. Solar Heat Gain Coefficient: Provide window units assembly maximum solar heat gain coefficient (SHGC) for overall glazed area of 0.49 or better for north orientation and 0.39 or better for all other orientations as determined in accordance with NFRC 200 by a laboratory accredited by a nationally recognized accreditation organization such as the National Fenestration Rating Council and shall be labeled and certified by the manufacturer.
 - a. Shading coefficient of the center of glass multiplied by 0.86 shall be an acceptable alternate for determining compliance with the SHGC required for the overall glazed area. Shading coefficient shall be determined using special data file determined in accordance with NFRC 300. Shading coefficient shall be verified and certified by the glass unit manufacturer.
- H. Sound Transmission Class (STC): Provide glazed windows rated for not less than 35 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- I. Accessible Windows: Where accessible glazed openings in accessible rooms or spaces are shown on the Drawings for operation by occupants, provide windows that comply with CCMC accessibility requirements for operable windows .
1. Window Hardware: Comply with ANSI A117.1 section 309.4 Operation, that need to be pushed, pulled, or lifted to open, provide hardware that requires that no more than 5 lbf of force be used to open or close the operable vent.
 2. Operation. Provide controls and operating mechanisms for Accessible Windows, in compliance with ANSI A117.1-2003 section 309.4 Operation, that are operable with one hand with a force of no more than 5 lbf and do not require tight grasping, pinching, or twisting of the wrist.

3. Confirm compliance with specified operating force requirements by having operable vent of accessible window tested by a recognized Independent Testing Laboratory or Agency and so labeled and certified by the manufacturer.

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, fabrication methods, product performance test certifications, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of accessible awning window indicated.
- B. LEED Submittals
 1. Product Data for Credit MR 4.1 and Credit MR 4.2: Indicating percentages by weight of postconsumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
 2. Credit MR5.1: Submit a statement from the product manufacturer stating the distance between the place of manufacturer and the project location.
- C. Shop Drawings: Shop drawings shall be the responsibility of the window manufacturer and prepared by the manufacturer's authorized agent bearing the manufacturer's name. Drawings prepared by others are not acceptable. Include building plans and elevations drawn at a minimum 1/8" scale; window unit elevations at minimum 3/8" scale; details of all components, including required reinforcement, to be drawn full size. Include floor plans, elevations, sections, details, hardware, attachments to other work, operational clearances, installation details, and the following:
 1. Mullion details, including reinforcement and stiffeners.
 2. Joinery details.
 3. Expansion provisions.
 4. Flashing and drainage details.
 5. Weather-stripping details.
 6. Thermal-break details.
 7. Glazing details.
 8. Window cleaning provisions.
- D. Samples for Verification: For the windows and components required, submit samples of size indicated below:
 1. Main Framing Member: 12-inch- long, full-size sections of extrusions with factory applied color finish.
 2. Window Corner Fabrication: 12-by-12-inch- long, full-size window corner including full-size sections of extrusions with factory-applied color finish, weather stripping, and glazing.
 3. Operable Window: Full-size unit with factory-applied finish.
 4. Hardware: Full-size units with factory-applied finishes.
 5. Weather Stripping: 12-inch- long sections.
- E. Product Schedule: For new windows using same designations indicated on Drawings.
- F. Qualification Data: For Installer, manufacturer, and testing agency.
- G. Field quality-control test reports.

- H. Product Test Reports: Based on AAMA criteria, submit for evaluation of most recent comprehensive tests performed, but in no case older than four years from date of submittal, by a qualified testing agency for each type, class, grade, and size of window. Test results based on use of downsized test units will not be accepted.
- I. Maintenance Data: For operable window sash, operating hardware, weather stripping and finishes to include in maintenance manuals.
- J. Thermal Performance Certifications: Submit certifications as required under "Performance Requirements" of this section.
- K. Operating Force: provide test results and compliance certification.
- L. Warranty: Special warranty as specified in this Section.

1.6 QUALITY ASSURANCE

- A. The Drawings and Specifications herein indicate types, sizes, profiles, connections, dimensional and operational requirements for accessible awning windows of the specific manufacturer's products as specified.
- B. Accessible awning windows having equal performance characteristics by other manufacturers may be considered, provided that deviations do not change the design concept or intended performance as determined by the Architect.
- C. Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of required windows. Aesthetic effects, such as simulated divided lites, are shown on Drawings by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to each other, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not modify intended aesthetic effects without Board approval. If modifications are proposed, submit comprehensive explanatory data to the Board for review.
 - 2. For replacement window projects use CPS archive information provided by the Board as basis for applied muntin and mullion design of simulated divided lites for shop drawings.
- D. Manufacturer Qualifications: A manufacturer capable of fabricating windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, calculations and verifiable history of manufacturing specified windows for a minimum of ten (10) years.
- E. Installer Qualifications: Installer to be certified by window manufacturer for installation of window units required.
 - 1. Engineering Responsibility: Preparation of data for windows, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project by a state of Illinois licensed engineer.
 - 2. Provide skilled craftspeople who have demonstrated a verifiable successful history of installing specified windows for a minimum of five (5) years.
- F. In addition to above comply with the following:

1. The Manufacturer shall visit the site before fabrication and examine existing window openings and frames into which the new replacement windows are to be installed. If any discrepancies, or conditions, are discovered that are detrimental to the proper and timely completion of the work, the Manufacturer is to notify the Architect in writing.
 2. Check actual window openings by accurate field measurement before fabrication. The replacement window tolerance of 1/2" less than the actual window opening dimensions will apply for all manufactured units. Units supplied plus or minus 1/4" in excess of the tolerance standards will be deemed out of compliance and will be replaced by the Manufacturer. Show recorded measurements on final shop drawings.
- G. Source Limitations: Obtain windows through one source from a single manufacturer.
- H. Mockups: Build mockups as directed by the Board to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.
 2. Mock up a minimum of three (3) accessible awning windows of each type, or three (3%) percent of each type of accessible awning window product; whichever is greater.
- I. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to windows including, but not limited to, the following:
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Review and discuss the finishes of windows that are required to be coordinated with the finishing of other adjacent work for color and finish matching.
 3. Review, discuss, and coordinate the interrelationship of windows with other exterior wall components. Include provisions for structural anchorage, glazing, flashing, weeping, sealants, and protection of finishes.
 4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
- J. Fenestration Standard: For minimum standards of performance, definitions, materials, components, accessories, and fabrication requirements conform to AAMA/WDMA/CSA 101/I.S.2/A440. In case of conflicts, comply with more stringent requirements.
- K. Furnish a valid AAMA "Authorization for Product Certification" indicating that the windows for the project conform to AAMA/WDMA/CSA 101/I.S.2/A440.
- L. Furnish visible, permanent IGCC certification labels indicating conformance to ASTM E 2190 on insulating glass units.
- M. Furnish visible, permanent SGCC certification labels indicating conformance to ANSI Z97.1 and/or 16 CFR 1201 on tempered glass lites, if included on the project, and laminated glass lites, if included on the project.
- N. Glazing Standard: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated on Drawings.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify window openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Protect windows from damage during handling and construction operations before, during and after installation.
- B. Store windows under cover, setting upright.
- C. Do not stack windows flat.
- D. Do not lay building materials and/or equipment on windows

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
 - c. Deterioration of metals, other materials, and metal finishes beyond normal weathering.
 - d. Faulty operation of operable vents and hardware.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Windows: Ten (10) years from date of **<Substantial Completion>** of the Project, as applicable.
 - b. Metal Finish: Ten (10) years from date of **<Substantial Completion>** of window installation.
 - c. Hardware: Ten (10) years from date of **Substantial Completion** of window installation.
 - d. Glazing: Ten (10) years from date of **<Substantial Completion>** of window installation.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Description: Subject to compliance with the requirements, provide factory assembled accessible awning windows from:
 - 1. Series 204 Composite Aluminum and Wood Awning Window as manufactured by:
 - a. H Window Company, LLC.
401 17th Avenue West
Ashland, WI 54806
 - 2. Series NX- 3500 Thermal Aluminum Awning Window as manufactured by:
 - a. TRACO Architectural Systems, Inc.
71 Progress Avenue
Cranberry Township, PA 16066
- B. Accessible awning windows having equal performance characteristics by other manufacturers may be considered, provided that deviations do not change the design concept or intended performance as determined by the Architect. The burden of proof for equality of other awning windows is on the proposer.

2.2 MATERIALS

- A. Aluminum Extrusions: extruded by the window manufacturer from commercial quality 6063-T5 alloy; free from defects impairing strength and durability.
- B. Wood: Clear Poplar for painted finishes; all wood to be free of finger joints.
 - 1. Kiln dried to moisture content no greater than twelve (12) percent at the time of fabrication.
 - 2. Water repellent preservative treated in accordance with WDMA I.S.4.
- C. Weather-stripping: Provide full-perimeter weather stripping for each operable ventilator. Installed weather stripping to be UV stable, flexible in low temperatures, and resistant to compression set; conforming to AAMA 701/702.
- D. Hardware: Provide ANSI A117.1 compliant operator and hinge hardware in manufacturer's standard finish complete with stainless steel limit stop for 6" opening restriction and release key for custodial access to clean and maintain operable vent.
- E. Screens General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches.
 - 1. Security Screens: Where indicated on Drawings, provide reinforcement to aluminum framing to accommodate loads and fasteners for attachment of metal window guard framing on exterior face of window. For requirements see Section 08661 Exterior Metal Window Guards.
 - 2. Insect Screens: Fabricate insect screens to fully integrate with window frame. Locate screens on inside of window and provide for each operable ventilator where shown on Drawings.
 - a. Provide insect screens on operating sash and ventilators in administrative offices, teachers' lounges, food preparation areas, and lunchrooms and where indicated on Drawings.
 - b. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints, concealed fasteners and removable PVC spline/anchor concealing edge of frame.

- 1) Extruded-Aluminum or Aluminum Tubular Framing Sections and Cross Braces: Not less than 0.040-inch wall thickness.
- 2) Finish: Match aluminum window members.
- c. Aluminum Wire Fabric: 18-by-16 mesh of 0.011-inch- diameter, coated aluminum wire.
 - 1) Wire-Fabric Finish: Charcoal gray.

2.3 FABRICATION

A. Window Unit Fabrication:

1. Aluminum Fabrication:
 - a. Vent and Frame: all members to be tubular; 45 degree reinforced mitered corners; crimped to extruded aluminum corner keys.
 - b. Frame and vent joints: factory sealed by window manufacturer with sealant conforming to AAMA 800.
2. Wood Fabrication: Vent and Frame:
 - a. Wood Surfaces: Wood shall be smooth and free of surface defects.
 - b. Corner Joinery: Vent and Frame connected with mortise and tenon joints; glued and stapled.
3. Composite Vent and Frame Construction: Fabricate window units with a continuous butyl tape or closed cell foam thermal/moisture barrier, located between exterior aluminum and interior wood. Fasten aluminum to wood with stainless steel ring-shanked nails at 6 inch on center spacing around perimeter of frame and sash.
4. Water control: pressure equalization compression gasket on vent interior to resist wind driven rain.
5. Weep holes: Provide exterior weep slots/holes in each sill of sufficient size to allow water drainage to exterior by gravity, but prevent ingress by insects
6. Emboss universal symbol of accessibility (1" diameter) on all operable window frames that comply with ADAAG with a contrasting color.
7. Provide 1-1/2" x 1-1/2" universal symbol of accessibility interior sign on bottom rail of operable window frames that comply with ADAAG. See section 10433 "Interior Signage".

B. Insulating Glass Units:

1. Preglaze window units at the factory using glazing method tested with unit as required and in conformance to ASTM E 2190; with visible, permanent IGCC certification label for window grade and performance requirements specified.
2. Provide 1" insulating glass units composed of two (2) sheets of minimum 3/16" thick glass (ASTM C 1048, Type I, Quality 3) permanently and hermetically sealed together at edges with with manufacturer's spacer system and sealant to provide a dehydrated air space with -80 degree F dew point, passing IGCC Test CBA.
 - a. Provide tempered glass both sides.
 - b. Provide soft coat low E coating on #2 surface of exterior lite of units meeting "performance requirements" of this Specification and Drawing notes.
 - c. Airspace fill: Argon gas.
 - d. Glazing Spacer color: black
 - e. Visible Light Transmittances: 80%

C. Finish on Aluminum Extrusions:

1. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes. Apply on clean extrusions free from serious surface blemishes; on exposed surfaces visible when installed product's operating vents are closed.
 2. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering or shrink wrapping before shipping.
 3. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
 4. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 50 percent Polyvinylidene fluoride resin by weight; complying with AAMA 2604.
 - b. Dry film thickness: minimum 1.2 mils on exposed surfaces, except inside corners and channels.
 - c. Color: Project color to be selected from CPS standard range of colors – (Almond), (Bronze), (Colonial White), (Sahara Sand) or (Sea Wolf). All other color selections subject to written authorization from the Board.
- D. Finish on Interior Wood: Factory Pre-finished. See Section 09900 for paint finish requirements. All visible wood surfaces shall be factory finished utilizing a primer coat and a two (2) coat finish coat system prior to window assembly. Color to match exterior aluminum framing color.
- E. Miscellaneous Metal Finishes:
1. Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A386 to 2.0 oz/sq. ft. or primed with iron oxide paint.
 2. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.
- F. Muntins for Simulated Divided Lites
1. Removable Muntins: Muntins to be made of extruded aluminum; with exposed surfaces finished to match window frame color; use concealed fastening clips for removal and cleaning; detailed for unrestricted expansion and contraction.
 2. Design: muntin bar cross-section profiles to match project requirements with material chosen from manufacturer's standards.
 3. Patterns: grid patterns to be designated by Architect.
 4. Location: exterior face of window
- G. Installation Accessories
1. Material: extruded aluminum; nominal .078" wall for panning and .062" wall for trim; with exposed surfaces finished to match window color and finish performance; install with concealed fasteners and required weatherseals. Detail installation for unrestricted expansion and contraction.

2. Exterior: preset panning; two-piece mullion cover; (two-piece head and jamb receptor with thermal break); (subsill with thermal break and end dams sealed by the window manufacturer); (sill cover); (slip-on expanders).
3. Interior: continous clip two-piece snap trim.
4. Mullions: with thermal break; (integral: mounted between frame members); (stack); (offset stack); (three-piece); (transition mullions between product types).

PART 3 – EXECUTION – NEW CONSTRUCTION

3.1 PREPARATION – GENERAL

- A. Comply with all applicable laws, rules and regulations.
- B. Inspect openings before beginning installation work. Verify that rough or masonry opening is correct and the sill is level.
- C. Assure that each window opening conforms to dimensions and tolerances taken at the time of site visit.
- D. Perform operations as necessary to prepare openings for proper installation and operation of new construction units. Verify openings are in accordance with shop drawings and Architects Drawings. Prepared openings to be in tolerance, plumb, level, and provided with secure anchoring. Window installation shall not begin until all conditions are satisfactory. Failure to do so does not relieve the Contractor from the need to furnish any and all materials, which may be required, in accordance with the specifications, without any additional costs to the Board.

3.2 PREPARATION- NEW CONSTRUCTION

- A. Perform operations as necessary to prepare openings for proper installation and operation of new construction units. Verify openings are in accordance with shop drawings and Architects Drawings. Prepared openings to be in tolerance, plumb, level, and provided with secure anchoring.
- B. New Construction: Verify wall openings and adjoining air and vapor seal materials are clean, dry and ready to receive work of this Section. Verify that rough opening and masonry openings are correct and the sill plate is level.
- C. Provide and apply sealant compound, meeting AAMA 808.3, at all joints and intersections and at all other opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth. Coordinate installation with wall flashings and other components of the work.

3.3 INSTALLATION – NEW CONSTRUCTION

- A. Remove new windows and accessories from crating and packaging material. Verify that all parts and accessories are included.

- B. Install in accordance with manufacturer's approved shop drawings, specifications and recommendations for installation of window units, hardware, operators and other components of work.
- C. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow of frames or sash. Maintain dimensional tolerances, aligning with adjacent work. Anchor securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action. In no case shall attachment to structure or to components of the window system be through or affect the thermal barriers of the window units.
- D. Coordinate attachment and seal of air and vapor barrier materials. Install under sill and sill brake metal flashing.
- E. Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier. Wedge fiberglass insulation between frames of new windows and construction to remain, or between frames and new receptor as applicable. Compress fiberglass to no less than 50 percent of original thickness.
- F. Set sill members and other members in bed of compound, joint fillers, or gaskets per manufacturer recommendations to provide weatertight construction. Seal units per sealant manufacturer's recommendations at all other opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- G. Anchor windows on all four sides with anchor clips
 1. Do not allow anchor clips to bridge thermal breaks
 2. Use separate clips for each side of thermal breaks.
 3. Make connections to allow for thermal and other movements.
 4. Do not allow building load to bear on windows.
 5. Use manufacturer's standard clips at all corners and at intermediate points not over 16" on center.
 6. Anchor clips are to be fully covered by panning or trim.
- H. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with the requirements specified in the window reference standard. Where incompatible metals join together, coat the abutting surfaces with asphaltic paint and use epoxy coated connectors.
- I. Pre-fit, pre-punch, etc., all materials so that the unit when assembled shall fit the openings and will not require any cutting, ripping or fitting on the job site other than trimming of the exterior panning to fit into the masonry opening and cutting interior trim to length by the installing crews.
- J. All voids between new window frames and adjoining construction shall be packed solid with fiberglass batt insulation before installation of interior trim or panning.
- K. Interior and exterior surfaces shall have proper contact for caulking back up. The caulking shall be in full contact with window members and exterior and interior walls providing a continuous air and water tight bead around perimeter of windows as shown on Drawings.

- L. It shall be the responsibility of the installation Contractor to repair any exterior and interior surfaces to the satisfaction of the Board approved representative damaged as a result of the installation procedures involved with the materials and products of this section.

3.4 FIELD TESTING

- A. Field Tests: Contractor shall perform and pay for onsite tests of selected newly installed windows or window system components. Test newly installed accessible awning window products as directed by the Board's Authorized Representative for air leakage and water penetration resistance.
 - 1. All new accessible awning window products shall be field tested in accordance with AAMA 502 by an AAMA accredited laboratory as selected by the Board's Authorized Representative and engaged by the responsible Contractor. Independent testing laboratory engaged to perform tests will meet all requirements of AAMA 204.
 - 2. Costs for all tests, both original and retests shall be paid for by the responsible Contractor. All unsuccessful tests, both original and retest, shall be paid for by the responsible Contractor.
 - 3. All testing work in accordance to AAMA 502 of newly installed accessible awning window products shall commence at initial window installation and shall be completed prior to issuance of a certificate of **<Substantial Completion>** for accessible awning window work; and in no case more than six months after the date of **<Substantial Completion>** of the installation. Any field testing required six months beyond the date of Final Acceptance of the accessible awning window installation, will be done in accordance with AAMA 511.
 - 4. Testing Quantity: Erect test chambers for each window product type identified on plans. Test three (3) accessible awning window products of each type, or three (3%) percent of each type of accessible awning window products installations; whichever is greater, for air infiltration and water penetration as specified in accordance to AAMA 502 after the accessible awning window products have been completely installed.
 - 5. Test Parameters:
 - a. Air infiltration field tests shall be conducted at the same uniform static test pressure as the laboratory test unit. The Maximum allowable rate of air leakage shall not exceed 1.5 times the laboratory test unit for hardware and glazing types consistent with the laboratory test unit. The field test air leakage rate shall not exceed 1.5 times the maximum allowable laboratory performance specified in the testing criteria listed in Section 1.4.D & E above for any configuration.
 - b. Water penetration field tests shall be conducted at a static test pressure of 4/5 of the laboratory test performance values for hardware and glazing types consistent with the laboratory test unit. The field test water test pressure shall not be less than 4/5 of the minimum allowable laboratory performance specified in the testing criteria listed in Section 1.4.F above for any configuration.
 - 6. All work on accessible window products that fail the field tests shall be re-executed until the installation passes the field testing. Modify methods of installation of subsequent work to incorporate required corrections identified by the testing process.

3.5 ADJUSTING AND CLEANING

- A. Adjust operating vent and hardware to provide tight fit at contact points and at weatherstripping, for smooth operation and weathertight closure.

- B. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and moving parts.
- C. Clean glass promptly after installation of windows. Remove glazing and sealant compound, dirt and other substances.
- D. Remove from site all removed materials, debris, packaging, banding and all other surplus materials and equipment. All materials removed from site become property of the Contractor who shall promptly remove same and legally dispose of at no additional cost to the Board.

3.6 PROTECTION

- A. Initiate all protection and other precautions required to ensure that window units will be without damage or deterioration (other than normal weathering) at time of acceptance.
- B. Submit to Architect written recommendations for maintenance and protection of windows following Substantial Completion of window installation work.

END OF SECTION

