

**SECTION 08801**  
**MISCELLANEOUS GLAZING**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Glazing shown and required to complete the Work not specified in other sections.
  - 1. Windows
  - 2. Glazed window Walls, including butt glazing
  - 3. Glazed Entrances
  - 4. Doors
  - 5. Door Lites in Exterior Hollow Metal Doors

1.2 SUBMITTALS

- A. Product Data: Submit complete printed data on each type of glazing product.
- B. Samples: Submit minimum 6" square samples of each type of glazing product.
- C. Certification: Submit letter from manufacturer stating that wired glass complies with ANSI 97.1, 1984 including impact requirements.
- D. Glazing Schedule: submit a glazing schedule including elevations and glazing details utilizing the same designation as indicated on the drawings identifying types and thicknesses of glazing products and methods of installation.

1.3 QUALITY ASSURANCE

- A. Installer: Experienced in installation of glazing required.
- B. Safety Glass: Comply with ANSI Z97.1, the Safety Standard for Architectural Glazing Material Standard for Architectural Glazing Materials (16 CFR 1201) issued by the Consumer Product Safety Commission and requirements of authorities having jurisdiction.
- C. Fire Resistance Rated glazing: Provide wire glass products that are identical to those tested per NFPA 80 and ASTM E 163 (UL 9) and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.5 PROJECT CONDITIONS

- A. Condition of Other Work: The Glazier must examine the framing or glazing channel surfaces, backing, removable stop design, and the conditions under which the glazing is to be performed, and notify the Contractor of any conditions detrimental to the proper and timely completion of the Work. Start of work will evidence acceptance of conditions.

## **PART 2 - PRODUCTS**

### **2.1 GLASS MATERIALS**

- A. Include a minimum 15% pre-consumer recycled glass in the prime glass (before floating)
- B. Float Glass: ASTM C 1036, Type I, Quality-q3, Class I (clear) unless otherwise indicated.
- C. Fire/Impact Rated Glazing Products: as indicated on the drawings.
- D. Tempered Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1. (clear), Quality q3 (glazing select), kind FT (fully tempered. Clear ); free of visible tong marks.
- E. Spandrel Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class I (clear), Quality q3 (glazing select), with ceramic coating applied to second surface free of pin holes, kind HS (heat strengthened) or kind FT (fully tempered). Ceramic coating color as selected by Architect from manufacturers full range.
- F. Laminated Glass: ASTM C 1172 and complying with testing requirements in 16CFR 1201 for Category II materials and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor or lose physical and mechanical properties after fabrication and installation.
  - 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturers written recommendations.
  - 2. Inter Layer Thickness: Provide thickness not less than indicated and as needed to comply with requirements.
  - 3. Interlayer Color: Clear
- G. Insulating Glass: Insulating glass units shall be factory assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM 2190, and complying with other requirements specified.
  - 1. Sealing System: Dual seal, with manufacturers standard primary and secondary.
  - 2. Spacer: Manufacturers standard spacer material construction.
  - 3. Desiccant: Molecular sieve or silica gel, or blend of both.
- H. Wired Glass: ASTM C 1036, Type II (patterned and wired glass, flat), Class 1 (transparent), Quality q6 (glazing); complying with ANSI Z97.1; 1/4" thick, Form 1 (wired, polished both sides), complying with UL requirements for use in fire-rated doors.

### **2.2 GLAZING MATERIALS**

- A. Compatibility: Select tapes of proven compatibility with other materials with which they will come into contact, including glass products and glazing channel substrates, under conditions of installation and service.
- B. Cellular Elastomeric Preformed Gaskets (CE-PG): Extruded or molded closed cell, integral-skinned neoprene of profile and hardness required to maintain seal; complying with ASTM C 509, Type II; black.
  - 1. Polyvinyl Chloride Foam Glazing Tape (PVC-GT): PVC foam tape with adhesive one side and one peel paper liner; Norseal U780, Norton or equal.
- C. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- D. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.
- E. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.
- F. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

## 2.3 GLAZING SEALANTS

- A. General:
  - 1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. Glazing Sealants: All glazing sealants installed in the building interior (defined as inside of the weatherproofing system and applied on site) shall meet testing and product requirements of the California Department of *Health Services Standards Practice for Testing Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda*.
  - 4. VOC Content: For Sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59 Subpart D.
  - 5. Colors of Exposed Glazing Sealants: As Selected by Architect from Manufacturers full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, grade NS Class 50, use NT
- C. Glazing Sealants for Fire rated Glazing products; Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire protection rating indicated.

## 2.4 FABRICATION

- A. Cut to size in the shop and key to glazing schedule
- B. Permanently mark each lite of safety glazing and fire resistive glazing where seen when installed on the lower right hand corner.
- C. Clean-cut or flat grind vertical edges of butt glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Protect glass from edge damage at all times during handling, installation and operation of the building. Glass breakage during the guarantee period will be considered a form of faulty material or workmanship (resulting from edge damage), unless known to result from vandalism or other causes not related to materials and workmanship.
- B. Glazing channel dimensions must provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thicknesses, with reasonable tolerances. The Glazier is responsible for correct glass size for each opening, within the tolerances and necessary dimensions established.

#### **3.2 INSTALLATION**

- A. Basic Requirements:
  - 1. Comply with combined recommendations of glazing product manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturers' technical representatives direct otherwise.
  - 2. Inspect each piece immediately before installation. Do not use pieces which have observable edge damage or face imperfections.
  - 3. Do not attempt to cut, seam, nip or abrade glass which is tempered.
  - 4. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate.
  - 5. Install setting blocks of proper size at quarter points of sill rabbet.
  - 6. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass, and use thickness equal to sealant width; except with sealant tape, use thickness slightly less than final compressed thickness of tape.
  - 7. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
  - 8. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
  - 9. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.
- B. Glazing Systems:
  - 1. Glaze lites in labeled assemblies in accordance with UL requirements.

2. Glaze balance of door lites and borrowed lights using setting blocks and PVC-GT or CE-PG having adhesive to stop between glass and stops both sides compressed 35 to 50%.
3. Install mirrors using Palmer mirror mastic in exact accordance with recommendations and bottom supports of aluminum or stainless steel. Do not use reglets.

### 3.3 CURE, PROTECTION AND CLEANING

- A. Remove and replace glazing products which is broken, chipped, cracked, abraded or damaged in other ways during the construction period, including natural causes, accidents and vandalism.
- B. Maintain in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other work.

### 3.4 GLAZING SCHEDULE

- A. Glass Type "G1-L": 1-inch Thick Insulated FT Laminated Exterior Glass Assembly: Unit shall consist of 1/4-inch thick Low-E tempered outboard lite Solarban 60 on #2 surface, 1/2 - inch airspace, 1/8-inch clear lite, a 0.030 clear PVB interlayer, and a 1/8-inch clear lite. Other manufacturer's products will be considered subject to meeting the performance criteria specified herein.
  1. Visible Light Transmittance: 70 percent minimum
  2. Solar Energy Transmittance: 32 percent
  3. Ultra-Violet Transmittance: <1 percents
  4. Visible Light Reflectance – Exterior: 11 percent
  5. Visible Light Reflectance – Interior: 11 percent
  6. Solar Energy Reflectance: 32 percent
  7. U-Value (Winter Nighttime): 0.29 Btu/(hr x sq. ft. x °F) maximum
  8. U-Value (Summer Daytime): 0.26 Btu/(hr x sq. ft. x °F) maximum
  9. Shading Coefficient: 0.43
  10. Relative Heat Gain: 91 Btu/hr x sq. ft.
  11. Solar Heat Gain Coefficient: 0.38 maximum
- B. Glass Type "G2-L": 1-inch Thick FT Laminated Exterior Glass Assembly: Unit shall consist of 1/4-inch thick clear lite , 1/2 -inch airspace, 1/8-inch clear lite, a 0.030 clear PVB interlayer, and a 1/8-inch clear lite. Other manufacturer's products will be considered subject to meeting the performance criteria specified herein.

END OF SECTION

## SECTION 08411 ALUMINUM ENTRANCES AND FRAMING

### PART 1 - GENERAL

#### SUMMARY

- A. Section Includes: Aluminum entrances and framing as indicated and as specified.

#### 1.2 SUBMITTALS

- A. Product Data: Submit copies of manufacturer's data, recommendations and standard details, including fabrication, finishing, hardware, accessories and other components of the Work.
- B. Shop Drawings: Submit Shop Drawings for the fabrication and installation and associated components of the Work signed and sealed by a licensed State of Illinois Structural Engineer stating compliance with "Quality Assurance" requirements.. Include wall elevations at 1/2" scale, and half-size detail sections of every typical composite member. Show anchors, joint system, expansion provisions and other components not included in manufacturer's standard data. Include glazing details.
- C. Samples: Submit a set of two (2) samples of required aluminum finish, showing extremes of color and appearance, on minimum 4" long extrusions of the alloys to be used for the Work.
1. The right is reserved to require samples of typical fabricated sections, showing joints, exposed fastenings (if any), quality of workmanship, hardware and accessory items, before fabrication of the Work proceeds.
- D. Certification: Submit written certifications, signed by window wall manufacturer, attesting that system conforms to each of the "Quality Assurance" requirements of this Specification where the manufacturer's standard system has been tested in accordance with specified tests and meets performance requirements specified. Where such testing has not been accomplished, perform required tests through a recognized testing laboratory or agency and provide certified test results.

#### 1.3 QUALITY ASSURANCE

- A. Standards: Comply with the requirements and recommendations in applicable specifications and standards by NAAMM, AAMA and AA, including the terminology definitions, and specifically including the "Entrance Manual" by NAAMM, except to the extent more stringent requirements are indicated. Conform to 16 CFR 1201.
- B. Installer: Regularly engaged in installation of the types of Work required and acceptable to the system manufacturer.
- C. Wind Loading: Fabricate exterior units to withstand the wind pressure loading of 30 lbs. per sq. ft. on the gross area of the system, acting inward and also acting outward except 40 lbs. per sq. ft. at corners when tested in accordance with ASTM E 330.

- D. Deflections and Thermal Movements: Design work and internally reinforce component members to withstand wind pressures, building deflections, construction shrinkage, thermal movements and erection tolerances, within the following deflection limitations and temperature variations without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects. Fabricate, assemble and erect the work to maintain these limitations.
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus ¼ inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
  2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below to less than 1/8 inch (3.2 mm) and clearance between members and operable units directly below to less than 1/16 inch (1.5 mm).
  3. Thermal expansion and contraction movement capability, resulting from not less than an ambient temperature range of 120°F, which may cause a window wall material temperature range of 180oF.
  4. Building deflection of L/360.
- E. Water and Air Leakage: Design, fabricate, assemble and erect work and system of sealed joints with other work, to be permanently free of significant leakage of both water and air. Significant leakage is defined as follows, based on a differential test pressure amounting to 20% of specified strength performance pressure required, testing a complete module of window wall work.
1. Air Infiltration (Framing): More than 0.06 cu. ft. per minute per sq. ft. (projected area of module), determined by ASTM E 283 at an inward test pressure of 6.24 PSF.
  2. Air Infiltration (Doors): Provide doors with an air infiltration rate of not more than 0.50 CFM for single doors and 1.0 for pairs of doors when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.567 PSF.
  3. Water Penetration: Provide framing systems with no water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf. per sq. ft.
- F. Condensation Requirements: Provide thermal-break construction, which provides a condensation resistance factor (CRF) of at least 55 per the requirements of AAMA 1502.7
- G. Thermal Performance: Provide window wall system and doors having maximum U-factor of 0.57 for fixed units and 0.67 for operable units as determined in accordance with NFRC 100 by a laboratory accredited by a nationally recognized accreditation organization such as the National Fenestration Rating Council and labeled and certified by the manufacturer; and assembly maximum solar heat gain coefficient (SAGC) of 0.49 for north orientation and 0.39 for all other orientations for overall glazed area 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. 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.

1. U-Factors from 8.1 of ASHRAE IESNA Standard 90.1-1999 shall be an acceptable alternate for determining compliance with the U-factor criteria. Where credit is being taken for a low-emissivity coating, the emissivity of the coating shall be determined in accordance with NFRC 301. Emissivity shall be verified and certified by the window wall manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Butler; Vistawall
  2. Efco
  3. U.S. Aluminum
  4. Kawneer
  5. Pittco
  6. Tubelite

### **2.2 MATERIALS AND ACCESSORIES**

- A. Aluminum Extrusions: Provide alloy and temper as recommended by manufacturer for strength, corrosion resistance, application of required finish and control of color, but not less than 22,000-psi ultimate tensile strength. Provide main extrusions of not less than 0.125" wall thickness.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other non-corrosive metal fasteners guaranteed by the manufacturer to be compatible with the doors, frames, stops, hardware, anchors and other items being fastened. For exposed fasteners (if any), provide Phillips flat-head screws with finish matching the item fastened.
  1. Do not use exposed fasteners except where unavoidable for the assembly of units, and unavoidable for the application of hardware. Provide only concealed screws in glazing stops.
- C. Steel Reinforcement and Brackets: Manufacturer's standard formed or fabricated steel units, of shapes, plates or bars; with 2.0 oz. hot-dip zinc coating complying with ASTM A 123, applied after fabrication to brackets and rust inhibitive paint applied to reinforcing elements.
- D. Concealed Flashing: Dead soft stainless steel, minimum 26 gauge.
- E. Inserts: For required anchorage into concrete or masonry work, furnish inserts of cast iron, malleable iron or 12 gauges steel hot-dip galvanized after fabrication.



- F. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.
- G. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PAINT 12, compounded for 30-mil thickness per coat.
- H. Sealants and Gaskets: Provide sealants and gaskets in the fabrication, assembly and installation of the Work, which are recommended by the manufacturer to remain permanently elastic, non-shrinking, non-migrating and weatherproof for the life of the building.
- I. Glazing Gaskets: For glazing glass, and for gaskets, which are factory-installed in a "captive" assembly of glazing stops, provide manufacturer's standard stripping of molded neoprene.

Glazing: See drawings for specific locations.

- J. Glass Type "G1-L": 1-inch Thick Insulated FT Laminated Exterior Glass Assembly: Unit shall consist of 1/4-inch thick Low-E tempered outboard lite Solarban 60 on #2 surface, 1/2 - inch airspace, 1/8-inch clear lite, a 0.030 clear PVB interlayer, and a 1/8-inch clear lite. Other manufacturer's products will be considered subject to meeting the performance criteria specified herein.
  - 1. Visible Light Transmittance: 70 percent minimum.
  - 2. Solar Energy Transmittance: 33 percent.
  - 3. Ultra-Violet Transmittance: 10 percent
  - 4. Visible Light Reflectance – Exterior: 11 percent
  - 5. Visible Light Reflectance – Interior: 12 percent
  - 6. Solar Energy Reflectance: 31 percent
  - 7. U-Value (Winter Nighttime): 0.29 Btu/(hr x sq. ft. x °F) maximum
  - 8. U-Value (Summer Daytime): 0.26 Btu/(hr x sq. ft. x °F) maximum
  - 9. Shading Coefficient: 0.44
  - 10. Relative Heat Gain: 91 Btu/hr x sq. ft.
  - 11. Solar Heat Gain Coefficient: 0.38 maximum

- H. Glass Type "G2-L": 1-inch Thick FT Laminated Exterior Glass Assembly: Unit shall consist of 1/4-inch thick clear lite, 1/2 -inch airspace, 1/8-inch clear lite, a 0.030 clear PVB interlayer, and a 1/8-inch clear lite. Other manufacturer's products will be considered subject to meeting the performance criteria specified herein.

## 2.3 HARDWARE

- A. Except as indicated otherwise herein, refer to Section "Door Hardware" of these Specifications for the furnishing of hardware items. Hardware templates will be furnished to the manufacturer for the fabrication of door and frames to receive hardware. Receive the hardware and coordinate with the hardware requirements of this Section. Report discrepancies in writing to the Contractor.

- B. Cut, reinforce, drill and tap frames and doors as required to receive hardware, except do not drill and tap for surface-mounted items until the time of installation at the Project Site. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- C. Install all hardware, except surface-mounted hardware, at the fabrication plant. Remove only as required for final finishing operations, and for delivery and installation of the Work at the Project Site.

## 2.4 FABRICATION

- A. Coordination of Fabrication: Wherever possible, check the actual openings in the construction work by accurate field measurement before fabrication, and show recorded measurements on final Shop Drawings.
- B. Prefabrication: Provide each door as a "packaged entrance" unit. Complete the fabrication, assembly, finishing, application of hardware and all other Work, before shipment to the Project Site, to the greatest extent possible. Disassemble only to the extent necessary for shipment and installation.
- C. Basic Fabrication:
  - 1. Complete the cutting, fitting, forming, drilling and grinding of all metal at the shop to the extent possible. Remove arrises from cut edges and ease edges and corners to a radius of approximately 1/64".
  - 2. Conceal fasteners, wherever possible, except as otherwise shown.
  - 3. Maintain continuity of line and accurate relation of planes and angles. Provide secure attachment and support at mechanical joints, with hairline fit of contacting members.
  - 4. Internally reinforce the Work as necessary for performance requirements, and for support to the structure. Separate dissimilar metals with bituminous paint or preformed separators, which will prevent corrosion. Separate metal surfaces at moving joints with nonmetallic separators to prevent "freeze-up" of joints.
- D. Weather Stripping: Where exterior door stiles or head rails do not close against fixed stops equipped with compression weather stripping, provide sliding weather stripping, retained in an adjustable strip in a mortise centered in the edge of the door. Provide heavy-duty, hollow, compression weather stripping in the bottom-rail, adjustable for contact with the threshold.
- E. Stile-and-Rail Type Aluminum Doors:
  - 1. Provide tubular frame members, fabricated with mechanical joints of heavy inserted reinforcing plates and concealed tie-rods or j-bolts, in accordance with manufacturer's standard fabrication methods; or fabricate with structurally welded joints, at manufacturer's option.
  - 2. Except as otherwise shown or scheduled, provide door units 1-3/4" thick.
    - a. Provide wide stile doors.
- F. Aluminum Framing:

1. Fabricate tubular and channel frame assemblies with either welded or mechanical joints using shear blocks with concealed fasteners wherever possible.
2. Provide non-removable doorstops extruded integrally with frame to extent possible.
  - a. Provide compression weather-stripping on the door-contact face of doorstop for exterior door frames, and on other frames where indicated.
  - b. Where weather stripping is not provided, install neoprene silencers on doorstops to prevent metal-to-metal contact between doors and stops.
3. Provide glazing system for frames to receive lights. Design system for replacement of glass, but for non-removal of glass from the exterior.
4. Fabricate frame assemblies for exterior walls with flashing and weeps to drain penetrating moisture to exterior. Provide anchorage and alignment brackets for concealed support of assembly from the building structure. Allow for thermal expansion of exterior units.
5. Provide all elements with thermal breaks to positively eliminate outside to inside metal contact. Provide thermal break materials certified to comply with Performance Requirements of the unit in each case (window or window wall).
  - a. Interior framing need not be thermal break construction.

## 2.5 ALUMINUM FINISHES

- A. Prepare the surfaces for finishing in accordance with recommendations of the aluminum producer and the finisher or processor.
- B. Finish all components of each assembly simultaneously so as to attain complete uniformity of color. Adjust and control the direction of mechanical finishes (as specified) to achieve the best overall visual effect in the Work, as determined in consultation with the Architect.
- C. Sequence the finishing and processing of materials in a predetermined bay-bay-bay plan, which will minimize color and texture differences between adjacent components.
- D. Color and Texture Tolerance:
  1. The right is reserved to reject the Work because of color or texture variations, which are visually objectionable, but only where the variation exceeds the range of variations established by the manufacturer prior to the Work, by means of range samples which have been accepted by the Architect.
  2. Prepare range samples on extrusions of profiles and shapes of the actual members of the Work. Establish range samples to maintain a total range of 2 degrees on the green reflectance scale.
- E. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- F. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

- G. Class I, Clear Anodic AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Do not install component parts, which are observed to be defective in any way, including warped, bowed, dented, abraided and broken members, including glass and edge damage. Remove and replace members, which have been damaged during installation.
- B. Deliver base plates for mullion anchorage in time to allow for installation. Provide setting drawings.

#### **3.2 ERECTION TOLERANCES**

- A. Limit variations from plumb, and level to the following:
  - 1. 1/8" maximum deviation.
- B. Limit variations from location (theoretical calculated positions in plan or elevation based on established floor lines and column lines), including variations from plumb and level, to the following:
  - 1. 3/8" total maximum deviation for any member at any location.
  - 2. 1/8" maximum change in deviation for any member at any 10' run, any direction.
- C. Limit offsets in the end-to-end and edge-to-edge alignments of adjoining and consecutive members, which form planes, continuous runs and profiles to the following:
  - 1. 1/16" maximum offset in any flush alignment, including any which are to be 1/2" or less out-of-flush, and including any which are separated 2" or less by a reveal or protrusion in the plane of the wall.
  - 2. 1/8" maximum offset in alignments which are to be out-of-flush by more than 1/2", or separated by a reveal or protrusion of more than 2" width.
- D. Provide sliding connections at top of mullions to accommodate deflections of L/360 of the floor above.

#### **3.3 ERECTION**

- A. Erect steel elements in accordance with AISC - Manual of Standard Practice.
- B. Certify welders in accordance with requirements of AWS.
- C. Do not cut, trim, weld or braze components during erection in any manner which would damage the finish, decrease the strength, or result in a visual imperfection or a failure in

performance of the window wall. Return component parts, which require alteration to the shop for refabrication, if possible, or for replacement by new parts, if not possible.

- D. Install components level, plumb, true to line and with uniform joints and reveals. Use erection equipment, which will not mark or stain finished surfaces, and will not damage the component parts in any way.
- E. Anchor component parts securely in place by bolting, welding or other permanent mechanical attachment system, which will comply with performance requirements and permit movements which are intended or necessary. Install slip-joints wherever necessary to ensure movement as intended or necessary.
- F. Apply bituminous paint of approximately 30-mil dry film thickness, or other suitable permanent separator, on concealed contact surfaces of dissimilar materials, before assembly or installation.
- G. Wire brush and touch-up prime welded and unshop primed steel.
- H. Provide close fitting sleeves at joints to insure alignment and no open joints.
- I. Provide all closures, panels, sill and stool covers and all other accessory items required for a complete installation. Form accessories of minimum .063" aluminum.
- J. Install fire stopping in accordance with requirements to obtain fire rating.

#### 3.4 GLAZING

- A. Protect glass units from edge damage at all times during handling and installation.
- B. Inspect for edge or surface damage and do not install defective units. The glazer is responsible for correct glass size for each opening, within the tolerances and necessary dimensions established.
- C. The glazer must examine the framing or glazing channel surfaces, backing, removable stop design, and the conditions under which the glazing is to be performed, and notify the Construction Manager in writing of any conditions detrimental to the proper and timely completion of the Work. Start of Work will evidence acceptance of conditions.
- D. Do not install glazing sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.
- E. Comply with combined recommendations of glass manufacturer and manufacturer of glazing sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturers' technical representatives direct otherwise.
- F. Comply with "Glazing Manual" and "Glazing Sealing Systems Manual" by Flat Glass Marketing Association, except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

- G. Before glazing begins, the Contractor shall conduct a meeting with the glass manufacturer, glazing materials manufacturer, glazer, and Construction Manager to review details of installation.
- H. Glazing Methods:
  - 1. Glaze in exact accordance with requirements necessary to obtain "quality assurance" specified hereinbefore.
  - 2. Immediately upon installation, protect glass from breakage by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surface of glass.
  - 3. Remove and replace glass, which is broken, chipped, cracked, abraded, or damaged in any other way during the installation period.
  - 4. Maintain glass in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other surfaces.

#### PROTECTION AND CLEANING

- I. Protect exposed aluminum work from damage by construction. Use lacquer coating only if totally removed without damage to finish. Use strippable covering only if totally removed without damage to finish. Remove protection and clean surfaces and glass immediately before acceptance of building.

END OF SECTION

## SECTION 07210

### BUILDING INSULATION

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: General building insulation indicated and as specified.

##### 1.2 SUBMITTALS

- A. Product Data: Submit complete printed data for each type of product indicating compliance.

##### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturers written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
  - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

#### PART 2 - PRODUCTS

##### 2.1 RIGID BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:
- B. Material Properties:
  - 1. Rigid closed cell extruded polystyrene thermal board insulation.
  - 2. Comply with ASTM C 578-92, Type IV, density 1.6 lb/cu. ft. min., compressive strength 25 psi (ASTM D 1621-73)
  - 3. Thermal resistance: 5-year aged R-values of 5.4 and 5.0 min.,  
□F-ft<sup>2</sup>-h/Btu<sup>2</sup>/inch at 40□F and 75□F respectively (ASTM C 518-91)
  - 4. Water absorption: Max. 0.3% by volume (ASTM C 272-91).
  - 5. Surface Burning Characteristics:
    - a. Flame spread: 5.
    - b. Smoke developed: 165.
  - 6. Type IV, 1.60 lb/cu. ft. (26 kg/cu. m), unless otherwise indicated
- C. Thickness: 1" unless otherwise indicated.

- D. Manufacturers:
  - a. DiversiFoam.
  - b. Dow.
  - c. Owens Corning.
  
- B. Polyisocyanurate Board Insulation:
  - 1. Thermal Resistance: 1"=R Value 6.5
  - 2. Compressive Strength: ASTM D1621 25 psi min.
  - 3. Flexural Strength: ASTM C203 55 psi min.
  - 4. Water Absorption: ASTM 209 0.05% x volume max.
  - 5. Water Vapor Permeance: ASTM E96 <0.03 perm. Max.
  - 6. Maximum Use Temp: 250 F.
  - 7. Flame Spread: 25
  - 8. Smoke Developed: 185
  - 9. Manufacturers:
    - a. Dow
    - b. Owens Corning
    - c. DiversiFoam

## 2.2 GLASS-FIBER BOARD INSULATION

- A. Recycled Content: Provide glass and slag wool-fiber/ rock-wool insulation with recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25%
  
- B. Manufacturers:
  - 1. CertainTeed Corporation.
  - 2. Johns Manville.
  - 3. Knauf Fiber Glass.
  - 4. Owens Corning.
  
- C. Unfaced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA; ASTM C 553, Types I, II, and III; or ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, passing ASTM E 136 for combustion characteristics; and of the following nominal density and thermal resistivity:
  - 1. Nominal density of not less than 1.5 lb/cu. ft. (24 kg/cu. m) nor more than 1.7 lb/cu. ft. (27 kg/cu. m), thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
  
- D. Foil-Faced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA or ASTM C 553, Types I, II, and III; faced on 1 side with foil-scrim-kraft vapor retarder; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; and of the following nominal density and thermal resistivity:
  - 1. Nominal density of not less than 1.5 lb/cu. ft. (24 kg/cu. m) nor more than 1.7 lb/cu. ft. (27 kg/cu. m), thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
  
- E. Unfaced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing



ASTM E 136 for combustion characteristics; and of the following nominal density and thermal resistivity:

1. Nominal density of 3 lb/cu. ft. (48 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).

F. Foil-Faced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; faced on 1 side with foil-scrim-kraft or foil-scrim-polyethylene vapor retarder, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; and of the following nominal density and thermal resistivity:

1. Nominal density of 3 lb/cu. ft. (48 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).\

### 2.3 SPRAY POLYURETHANE FOAM

A. The polyurethane foam shall be a two component system made by combining an isocyanate (A) component with a polyol (B) component and shall possess the following physical characteristics.

1. Density (sprayed in place): ASTM D-1622 2.0 lbs/cu.ft
2. Compressive Strength: ASTM-D 1621 15lb/ sq.ft Minimum
3. R –Value per Inch: R=6.5
4. Closed Cell Content: ASTM D-2856 < 90% Minimum
5. Flammability (FSI): ASTM E-84 75 or Less
6. Smoke: ASTM E-84 450 or less smoke developed rating
7. System Performance: .04cfm when tested at 1.57psf
8. Perms: >1.4 per inch
9. Manufacturers:
  - a. BASF  
Heatlok

B. When Primer is required, the primer shall be applied to the properly prepared substrate in accordance with the manufacturer's guidelines so as to achieve a minimum thickness of dry mils.

C. The polyurethane foam shall be sprayed within the manufatcurer's guidelines for temperature, humidity and other atmospheric conditions.

D. Manufacturers:

- 1.

### 2.4 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

### 2.5 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:

1. Products:
  - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.

- b. Eckel Industries of Canada; Stic-Klip Type N Fasteners.
- c. Gemco; Spindle Type.

Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.

Spindle: Copper-coated, low carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.

Products:

- d. AGM Industries, Inc.; RC150.
- e. AGM Industries, Inc.; SC150.
- f. Gemco; Dome-Cap.
- g. Gemco; R-150.
- h. Gemco; S-150.

B. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

1. Products:

- a. AGM Industries, Inc.; TACTOO Adhesive.
- b. Eckel Industries of Canada; Stic-Klip Type S Adhesive.
- c. Gemco; Tuff Bond Hanger Adhesive.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

#### **3.3 COORDINATION**

- A. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

#### **3.4 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturers written instructions applicable to products and application indicated.

- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

### 3.5 INSTALLATION OF PERIMETER INSULATION

- A. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
  - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
- C. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection course with joints butted. Set in adhesive according to insulation manufacturer's written instructions.
- D. Protect top surface of horizontal insulation from damage during concrete work by applying protection course with joints butted.

### 3.6 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Install batt insulation in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:
  - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
  
- D. Install board insulation on solid substrates by adhesively attached, spindle-type insulation anchors as follows:
  1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
  2. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
  3. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
  
- E. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

### 3.7 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

## **SECTION 10425**

### **METAL LETTERS**

#### **PART 1 - GENERAL**

##### 1.1 SUMMARY

- A. Section Includes: Dimensional letters and numbers as indicated and as specified.

##### 1.2 SUBMITTALS

- A. Product Data: Submit complete printed data for each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Shop Drawings: Shop drawings showing fabrication and erection of signs. Show anchors, grounds, layout, and installation details.
  - 1. Provide message list for each sign required.
- C. Samples: Samples for verification of compliance with requirements: full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.

##### 1.3 QUALITY ASSURANCE

- A. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.

##### 1.4 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

#### **PART 2 - PRODUCTS**

##### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. A.R.K. Ramos
  - 2. Gemini Inc.
  - 3. Metal Arts.
  - 4. OMC Industries, Inc.
  - 5. The Southwell Co.

## 2.2 MATERIALS

- A. Aluminum Sheet: Provide aluminum sheet of alloy and temper recommended by the sign manufacturer for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209 for 5005-H15.
- B. Aluminum Extrusions: Provide aluminum extrusions of alloy and temper recommended by the sign manufacturer for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
- C. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by the sign manufacturer for the casting process used and for the use and finish indicated.
- D. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to the sign material and mounting surface.
- E. Anchors and Inserts: Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

## 2.3 DIMENSIONAL LETTERS AND NUMBERS

- A. Fabricated Letters and Numbers: Fabricate letters and numbers to required sizes and styles, using metals and thicknesses indicated. Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories. Comply with requirements indicated for finish, style, and size.
  - 1. Aluminum Sheet: Not less than 0.090 inch thick. Fabricate by the heliarc welding process and waterjet cutting.
  - 2. Letter Height: 12 inches.
  - 3. Letter Style: Helvetica.

## 2.4 FINISHES

- A. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
- B. Aluminum Finishes: Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
  - 1. Class II Clear Anodized Fine Satin Finish: AA-M31C21A31 (Mechanical Finish: Fine satin directional textured; Chemical Finish: Fine matte etched finish; Anodic Coating: Class II Architectural, clear film thicker than 0.4 mil).

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.

1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- B. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish letter spacing and to locate holes for fasteners.
  1. Projected Mounting: Mount letters at the projection distance from the wall surface indicated.

### 3.2 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION

## SECTION 07131

### SELF-ADHERING SHEET WATERPROOFING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Waterproofing system indicated and as specified.

##### 1.2 SUBMITTALS

- A. Product Data: Submit complete printed data o each product to be provided. Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. Shop Drawings: Submit shop drawings. Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Include setting drawings showing layout, sizes, sections, profiles, and joint details of

##### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that is acceptable to waterproofing manufacturer for installation of waterproofing required for this Project.

##### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions.
- E. Protect stored materials from direct sunlight.



## 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
  - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

## PART 2 - PRODUCTS

### 2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: 60-mil- (1.5-mm-) thick, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated to a 4-mil- (0.10-mm-) thick, polyethylene film with release liner on adhesive side.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. American Hydrotech, Inc.; VM 75.
    - b. Carlisle Coatings & Waterproofing Inc.; CCW MiraDRI 860/861.
    - c. CETCO Building Materials Group; Envirosheet.
    - d. Grace, W. R. & Co.; Bituthene.
    - e. Henry Company; Blueskin WP 200.
    - f. Meadows, W. R., Inc.; SealTight Mel-Rol.
    - g. Progress Unlimited, Inc.; Plastiwrap 60.

### 2.2 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
  - 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid primer recommended for substrate by manufacturer of sheet waterproofing material.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by manufacturer of sheet waterproofing material.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating.
- F. Sheet Strips: Self-adhering, rubberized-asphalt sheet strips of same material and thickness as sheet waterproofing.

- G. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.
- H. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
  - 1. Thickness: **1/8 inch (3 mm)**.
  - 2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for type of protection course.

### **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
  - 2. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

#### 3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
- F. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

#### 3.3 WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and according to recommendations in ASTM D 6135.

- B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.
  - 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic.
- E. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.
- F. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- G. Install protection course with butted joints over waterproofing membrane immediately.
- H. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

#### 3.4 PROTECTION AND CLEANING

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

**SECTION 04200**  
**UNIT MASONRY**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Masonry required to complete the Work
- B. Options
  - 1) Where “stone” is indicated built into masonry, provide either cast stone as specified or limestone as specified at contractor’s option.

1.2 SUBMITTALS

- A. Product Data: Submit copies of manufacturer's specifications and instructions for reinforcing and accessory materials and proprietary materials.
- B. Shop Drawings:
  - 1. Submit Shop Drawings for stone in the form of cutting and setting drawings showing size, profiles, locations and anchoring.
  - 2. Submit shop drawings for reinforcing detailing, fabrication, bending and placement of reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, control joints and arrangement of masonry reinforcement.
- C. Samples - Mortar:
  - 1. Submit samples of colored mortar, showing the range of color which can be expected in the finished Work.
- D. Samples - Concrete Masonry Units (CMU):
  - 1. Submit 3 samples of each type of CMU unit. Select units to show the range of color and texture which can be expected in the finished Work.
  - 2. Submit test reports conducted within last 6 months in accordance with ASTM C 140 demonstrating specification compliance.
- E. Samples - Brick:
  - 1. Submit 3 samples of exposed brick to Architects. Include the full range of exposed color and texture to be expected in the completed Work.
    - a. Submit test reports for test conducted on the brick proposed for use not more than six (6) months before submittal in accordance with ASTM C 67 demonstrating specification compliance. Include initial rate of absorption.

2. Submit sufficient samples of each brick and other masonry unit to be utilized to the mortar batch plant, representing the full range of exposed color to be expected in the completed Work to construct prisms consisting of not more than 7 bricks for each different brick and brick combinations as they occur in the Work.
- F. Samples - Stone: Submit three samples, approximately 4" x 6", having proposed finish and color.
- G. Test Reports: Submit material test reports from a qualified independent testing laboratory complying with ASTM C1093 to be employed and paid by Contractor with affidavits/certifications indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
1. Mortar to comply with physical properties requirements set forth in ASTM C270.
  2. Clay masonry to comply with the physical properties requirement set forth in ASTM C216. Test report shall include compressive strength, 24 hour soak, 5 hour boil, saturation coefficient, efflorescence, and IRA (suction) tests.
  3. Concrete masonry units to comply with physical properties requirement set forth in ASTM C90.
- H. Certification: Plant mixed mortar and plant mixed grout: Submit statement from provider for each different cement product, name of manufacturer, brand, type and weight slips at the time of delivery for each 20 tons of mortar and grout.
- I. Certification; Ground-Face CMU: Submit certification from the producer of the Ground-Face CMU stating that the units to be provided meet the soiling and cleanability requirements of ASTM C-744.
- J. Insulation Certification: Submit a certification signed and dated by the insulation installer listing the type of insulation installed, the manufacturer, and R-value.
- K. Certification, Reinforcing Bar: submit certification indicating each material and grade.
- L. Certification, Joint Reinforcing: submit certification indicating type and size of joint reinforcement.
- M. Certification, Masonry Anchors and ties: indicate each type and size.
- N. LEED Submittals; LEED Credit MR 4.1 (and MR 4.2) and MR 5 (CMU): Submit separate certifications from the manufacturers of regular CMU, Glazed CMU, and Ground Faced CMU stating the following:
1. The percentage of recycled material in the product demonstrating compliance with specification requirements.
  2. The percentage of replacement of Portland Cement by recycled product and the type of product.
  3. The product was manufactured within 500 miles of the Project.

- O. LEED Credit MR 4.1 (and MR 4.2) and MR 5 (Brick): Submit certification stating the percentage of recycled content of the brick (pre-consumer and post-consumer, if any; and that the location of the manufacturer is within 500 miles of the site, if so.

### 1.3 QUALITY ASSURANCE

- A. Materials:
  - 1. Do not change source or brands of masonry mortar materials during the course of the Work.
  - 2. Obtain concrete masonry units (CMU) from one manufacturer, cured by one process and of uniform texture and color, for each type required for each continuous area and visually related areas.
- B. Fire-Resistive ratings: Provide materials and construction identical to those of assemblies with fire-resistive ratings determined per ASTM E119 by a testing and inspection agency, by equivalent concrete masonry thickness, or other means, as acceptable to authorities having jurisdiction.
- C. Regulatory Requirements: Comply with the applicable requirements of governing authorities and codes.
- D. Unit Masonry Standard: Comply with TMS 6.02 / ACI 530.1/ASCE 6 current edition "Specifications for Masonry Structures," except as otherwise specified.
- E. Coordination: Review installation procedures and coordinate with other Work that must be integrated with masonry.
- F. Job Mock-Up: Prior to installation of masonry work, erect sample wall panel mock-up using materials, reinforcing, bond and joint tooling shown or specified for final Work. Build mock-up at the site, where directed, of full thickness and approximately 4' high x 6' wide, unless otherwise shown, indicating the proposed range of color, texture and workmanship to be expected in the completed Work. Obtain Architect's acceptance of visual qualities of the mock-up before start of masonry work. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until Work is completed. Provide mock-up panel for each type of exposed unit masonry work.
  - 1. Construct mock-up separate from the Work. Do not incorporate mock-up into the Work.
  - 2. For cavity wall construction, construct the entire wall profile showing face brick, cavity, cavity wall insulation, concrete masonry unit backup, a grouted concrete masonry cell with reinforcing bar simulating a grout key, horizontal joint reinforcing, ties, base flashing, along base at corner condition, weep hole ventilators, and a typical lintel and sill showing flashing with end dams.
- G. Preinstallation Conference: Conduct preconstruction conference at the project site.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

#### 1.5 PROJECT CONDITIONS

- A. Masonry Protections:
  - 1. During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
    - a. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
  - 2. Do not apply uniform floor or roof loads or concentrated loads for at least 3 days after building masonry walls or columns.
  - 3. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
  - 4. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
  - 5. Protect sills, ledges, and projections from mortar droppings.
  - 6. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
- B. Frozen Materials: Do not use frozen materials or materials mixed or coated with ice or frost.
- C. Frozen Work: Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.
- D. Cold Weather Construction: Comply with the cold weather requirements indicated in TMS 602/ACI 530.1/ASCE 6 and the following when the ambient temperature falls below 40° F or the temperature of masonry units is below 40° F, comply with the following:

1. Temperature of masonry units shall not be less than 20° F when laid in the masonry. Remove visible ice on masonry units before the unit is laid in the masonry.
  2. Heat mortar sand or mixing water to produce mortar temperatures between 40° F and 120° F at the time of mixing. Maintain mortar above freezing until used in masonry.
  3. Use heat sources where ambient temperatures are between 25° F and 20° F, on both sides of the masonry under construction and install wind breaks when wind velocity is in excess of 15 mph.
  4. Where ambient temperatures are below 20° F, provide an enclosure for the masonry under construction and use heat sources to maintain temperatures above 32° F within the enclosure.
  5. Where mean daily temperatures are between 40° F and 32° F protect completed masonry from rain or snow by covering with a weather resistive membrane for 24 hours after construction.
  6. Where mean daily temperatures are between 32° F, and 25° F completely cover completed masonry with a weather resistive membrane for 24 hours after construction.
  7. Where mean daily temperatures are between 25° F and 20° F, completely cover completed masonry with insulating blankets or equal protection for 24 hours after construction.
  8. Where mean daily temperatures are below 20° F, maintain masonry temperature above 32° F for 24 hours after construction by enclosure with supplementary heat, by electric heating blankets, by infrared heat lamps, or by other acceptable methods.
- E. Hot Weather Construction: When the ambient air temperature exceeds 100° F or 90° F with a wind velocity greater than 8 mph, do not spread mortar beds more than 4 foot ahead of laying masonry units and set units within one minute of spreading mortar.

## PART 2 - PRODUCTS

### 2.1 MASONRY MATERIALS

#### A. Brick:

1. Face brick: Use Existing Salvaged Brick.
2. Provide special shapes required to avoid exposing coring or where exposed faces do not match uncut faces.

#### B. Concrete Masonry Units (CMU):

1. Size: Nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual), unless otherwise indicated.
2. Special Shapes: Provide for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
  - a. Provide bullnose block for outside corners, unless otherwise indicated.
3. Hollow and Solid CMU: ASTM C90 minimum net area compressive strength of  $f_m = 1900$  PSI



4. Weight: Provide medium weight units producing dry weight of not more than 125lbs. per cubic foot, except as acceptable for ground faced units.
  5. Exposed Faces:
    - a. Provide fine texture.
- C. Materials - Mortar and Grout:
1. Portland Cement: ASTM C 150, Type I.
  2. Masonry Cement: Not acceptable.
  3. Lime: ASTM C 207, Type S.
  4. Aggregate for Mortar: Sand, ASTM C 144, except for joints 1/4" and less (if any) use aggregate graded with 100% passing the No. 16 sieve.
  5. Water: Clean, free of deleterious materials which would impair strength or bond.
  6. Aggregate for Grout: ASTM C 404.
  7. Pointing Mortar: Prebagged Ceramic Tile Grout (sanded), to be mixed with an acrylic latex additive and manufactured by one of the following:
    - a. Hydroment by Bostik
    - b. Laticrete International
    - c. Custom Building Products
- D. Mortar Pigment: Compounded for use in mortar mixes by one of the following:
1. Bayer Corporation, Industrial Chemicals Div.: Bay ferrox Iron Oxide Pigments.
  2. Davis Colors; True Tone Mortar Colors.
  3. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors
- E. Reinforcing Bars: ASTM A 615, Grade 60.
1. Where reinforcing bars are used, provide rebar positioners.
- F. Continuous Wire Reinforcing:
1. Provide welded wire units prefabricated in straight lengths of not less than 10', with matching corner ("L") and intersection ("T") units. Fabricate from steel wire complying with ASTM A 82, with deformed continuous side rods and plain cross rods, with unit width of 1-1/2" to 2" less than thickness of wall or partition.
  2. For single wythe masonry, provide units fabricated as follows:
    - a. Ladder type fabricated with single pair of side rods and perpendicular cross rods spaced not more than 16" o.c.
  3. For multi-wythe masonry, tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches o.c.; with side rods spaced for embedment within each face shell of backup wythe and ties extended to engage the outer wythe by at least 1-1/2 inches.
    - a. Use continuous ladder type wire reinforcing units with adjustable 2-piece loop or eye and pintle type ties where horizontal joints in facing wythe do not align with those of back up or where wall exceeds 15 feet in height. Anchors portion shall have a maximum offset not to exceed 1-1/4 inch.
  4. Wire: Fabricate with 9-gauge side and cross rods, unless otherwise indicated.

- a. Provide zinc-coated (galvanized) wire ASTM A 641 for interior partitions.
- b. Provide hot-dipped galvanized finish after fabrication, ASTM A 153, Class B-2, (1.5 oz./sq. ft) for exterior walls.

H. Anchoring Devices:

1. Adjustable Anchors: Provide adjustable anchors which will permit horizontal and vertical movement of masonry but will provide lateral restraint, and as follows:
  - a. For anchorage to steel framework, provide V-shaped 3/16" wire tie sections sized to extend to within 1" of face of masonry, hot-dipped galvanized finish conforming to ASTM A 153, Class B-2, (1.5 oz./sq. ft).
  - b. Furnish to steel fabricator for installation on web of steel members where masonry anchors are indicated on the drawing, and where masonry passes or abuts the member 1/8 inch (3.19mm) 7 inch high receptor angle having slotted flange, 5 inch slotted hole in one leg located 3/4inch from edge of angle to receive wire tie section similar to Dur-O-Wall D/A 700 series triangular ties or equivalent.
  - c. Furnish to steel fabricator for installation on flange of steel member where masonry anchors are indicated on the drawings and where masonry passes or abuts the member. Provide 1/4 inch crimped wire anchor in 8-foot lengths for welding to steel flange to receive wire tie section similar to Dur-O-Wall D/A 700 Series triangular ties or equivalent.
  - d. For anchorage of concrete masonry to concrete masonry at control joints provide joint stabilizing anchor similar to Dur-O-Wall D/A 2200 or equivalent. For anchorage of concrete masonry wall to non-load bearing concrete masonry walls, provide wire mesh hardware cloth masonry ties complying with ASTM A185.
2. Stone Anchors: Fabricate cramp anchors and dowels of stainless steel. Provide minimum 3/16" thick cramp anchors and minimum 3/8" diameter dowels.

I. Accessory Materials:

3. Bond Breaker Strips: 15 lb. asphalt impregnated building felt.
4. Pre-Molded Control Joint Strips: Solid rubber or PVC strips with a minimum Shore A durometer hardness of 70, designed to maintain lateral stability in masonry wall.
5. Compressible Filler: Expanded polyethylene.
6. Expansion Filler: Closed cell neoprene 3/8" thick with peel off pressure sensitive adhesive on one side similar to Dur-O-Wall D/A 2010, rapid-soft joint or Hohmann & Barnard # NS Joint.
7. Weep-hole Ventilator: Continuous cellular flexible, ultraviolet resistant polypropylene. Dur-O-Wall Cell Vent, D/A 1006 or Hohmann & Barnard # QV vent width and height the same as brick head dimension. Color selected by Architect.
8. Precompressed Expansion for Sealant: Emseal 25
9. Mortar Collection Device: Free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings, thickness required to fill cavity.
  - a. Mortar Break; Advanced Building Products

- b. CavClear Masonry Mat; CavClear
  - c. Mortar Net; Mortar Net
  - d. Mortar Stop; Polytite
- J. Through-Wall Flashing:
- 10. Rubberized Asphalt Sheet Flashing: Manufacturer's standard composite flashing product consisting of minimum 26-mil-thick pliable and highly adhesive rubberized asphalt compound bonded completely and integrally to 4-mil-thick, high-density, cross-laminated polyethylene film to produce an overall thickness of 30 mils. Manufactured by Carlisle, W. R. Grace, Illinois Products Corp. or Polyguard.
    - a. At drips, provide minimum 2" wide x 0.015" thick continuous stainless steel with one side hemmed edged and bent down 1/4" (at 45°) to form a drip. Stainless steel to be 304 or 316 grade.
    - b. Provide stainless steel edge for construction adhesive on top of foundation walls.
    - c. Provide prefabricated pre-formed corner boots of rubberized asphalt flashing material for outside corners and flashing end dams at lintels, sills, inner corners and all other types of end terminations.
    - d. Provide mastic and primer recommended by the flashing manufacturer
- L. Cast Stone: A combination of white and/or gray Portland Cement, natural sand, marble and/or quartz aggregate and natural and synthetic pigments cast to produce a minimum compressive strength of 6,000 psi and a maximum 5% absorption reinforced as required for stresses of transportation, handling and loads imposed by construction where used as lintels. Comply with ASTM C 1364
- 1. Provide cast stone by a manufacturer having at least 5 years experience.
    - a. American Art Stone
    - b. Continental Cast Stone
    - c. Dallas Cast Stone
    - d. Edwards
    - e. Russell
- M. Drainage Matting
- 1. Drainage Matting: fluid conducting-non-absorptive mold resistant high impact dimpled styrene drainage panel with permeable-face or polymer mesh consisting of woven textile product in random pattern having voids no greater than ¼ inch in diameter. Matting shall be integrally bonded to the face of the rigid board insulation and shall be suitable for substantially continuous installation within the full height of the wall cavity.
    - a. Drainage mat thickness: 3/8" – 1/2".
  - 2. Masonry mat thickness shall allow no more than 5/8 inch tolerance between masonry mat and the masonry wythe.
  - 3. Products:

- a. Thermadrain; Thermadrain, Inc.
  - b. CavClear Insulation System: Archovations, Inc.
  - c. ThermaCav; T. Clear Corporation.
4. Adhesive: Type recommended by insulation board manufacturer and air barrier for application indicated.
- N. Brick and Masonry Cleaner: Sure-Kleen Vanatrol by Prosoco, 202V Vana-Stop by Diedrich or as recommended by the brick manufacturer.

## 2.2 MORTAR MIXES

- A. General: Mortar for Unit Masonry, comply with ASTM C270, Proportion Specifications for Type “N” portland lime mortar (1:1:6) except where indicated otherwise
1. Provide only plant mixed mortar as specified.
- B. Mortar for Unit Masonry: Provide only premixed, pre-bagged mortar supplied from plant.
1. Comply with ASTM C270, proportion specification for type “N” indicated in table 1.
  2. Minimum compressive strength of mortar 1800 psi.
  3. Provide only plant mixed mortar as specified. Mortar manufacturer must provide test results indicating the mortar’s compliance with this specification.
  4. When used in ground face CMU and in brick, colored mortars are to be selected by the architect to match masonry units.
- C. Grout: Portland cement, sand, gravel and water, proportioned as required ASTM C476 to provide a 28-day minimum compressive strength of 2000 psi. Mix grout to obtain on 8” to 10” slump unless otherwise indicated.
1. Self Consolidating Grout (SCG) must meet the following requirements:
    - a. T20 between 2 to 5 seconds
    - b. Visual Stability Index (VSI) to be zero
    - c. A total spread range between 22” to 30” when mixed with the appropriate amount of water.
- D. Plant Mixing Mortar and Grout:
1. Proportion mortar to comply with required type per ASTM C270.
    - a. Have tests conducted by independent laboratory for compressive strength and bond strength for each masonry composite and submit results.
    - b. If specified compressive strength cannot be obtained by adjusting mortar mix within specified range of the mortar type specified, immediately notify the Architect and provide recommendations.
    - c. Conduct separate tests for each brick and separate tests utilizing different brick or other masonry units as combination occurs on the job.

2. Dry mix materials utilizing equipment designed to insure uniform blending and precision measuring devices to insure uniformity from batch to batch.
3. Deliver and maintain at site bulk dry blended ingredients in enclosed container.
4. Add only clean water at the site.
5. Provide required certificates.

## 2.3 STONE FABRICATION

- A. Fabricate to profiles. Provide holes and sinkages as required.
- B. Fabricate in lengths shown, or if not shown, in approximately 4 foot sections. Allow for 3/8" joints. Provide drips and wash surfaces on all projecting portions.
- C. Provide minimum two cramp anchors at top and bottom between panel units and minimum 2 dowels per coping and sill unit.
- D. Provide mitered corners.

## 2.4 FIELD QUALITY CONTROL

- A. Owner will employ a testing laboratory experienced in performing types of masonry field quality control tests for engineered masonry indicated.
  1. Perform the following field tests, a minimum of 3 sample each, per 5000 sq. ft. of wall area.
    - a. Mortar compression test per ASTM C780
    - b. Grout prism test per ASTM C1019
    - c. Concrete masonry prism test per ASTM C1314
    - d. Flexural bond strength of brick when brick are structural test per ASTM C1072
    - e. Cone slump test for grout as required
- B. Evaluation of Quality Control Tests: Masonry work, in absence of other indications of noncompliance with requirements, will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Start of work will evidence acceptance of conditions.

3.2 PREPARATION

- A. Lay out partitions on floors and locate door frames.
- B. Reinforcing: Before placing, remove loose rust, ice and contaminates.

3.3 INSTALLATION

- A. Tolerances: Erect masonry within the following tolerances from the specified dimensions:

1. Dimension of elements.
  - a. In cross section or elevation ..... -1/4 in., +1/2 in.
  - b. Mortar joint thickness
    - bed.....  $\pm 1/8$  in.
    - head..... -1/8 in., +1/4 in.
    - collar ..... -1/4 in., +3/8 in.
  - c. Grout space or cavity width..... -1/4 in., +3/8 in.
2. Elements
  - a. Variation from level:
    - bed joints.....  $\pm 1/4$  in. in 10 ft.
    - .....  $\pm 1/2$  in. maximum
    - top surface of bearing walls..... +1/4 in. in 10 ft.
    - .....  $\pm 1/2$  in. maximum
  - b. Variation from plumb .....  $\pm 1/4$  in. in 10 ft.
  - .....  $\pm 3/8$  in. in 20 ft.
  - .....  $\pm 1/2$  in. maximum
  - c. True to a line .....  $\pm 1/4$  in. in 10 ft.
  - .....  $\pm 3/8$  in. in 20 ft.
  - .....  $\pm 1/2$  in. maximum
  - d. Alignment of columns and walls (bottom versus top)
    - .....  $\pm 1/2$  in. for bearing
    - ..... walls
    - .....  $\pm 3/4$  in. for non-bearing walls
3. Location of elements
  - a. Indicated in plan .....  $\pm 1/2$  in. in 20 ft.
  - .....  $\pm 3/4$  in. maximum
  - b. Indicated in elevation.....  $\pm 1/4$  in. in story
  - ..... height
  - .....  $\pm 3/4$  n. maximum
4. In placing of reinforcement (See Article 3.4E of ACT 530.1)

- B. Installation, General:

1. Comply with TMS 602/ACI 530.1/ASCE 6 Current Edition and this Specification.
2. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match Work immediately adjacent to the opening.
3. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide required pattern and to fit adjoining Work neatly. Use full-size units without cutting wherever possible.
4. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and offsets. Avoid the use of less than half-size units at corners, jambs and wherever possible at other locations.
5. Lay up walls plumb and true to comply with specified tolerances, with courses level, accurately spaced and coordinated with other Work.
6. Where shown or scheduled, provide special units and bond.
7. Lay all other exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below (except in one - third running bond where required by unit size).
8. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than 4" horizontal face dimensions at corners or jambs.
9. Discard units with cracked faces, chipped edges, or corners or other defects that affect appearance or performance.

C. Mortar Bedding and Jointing:

1. Lay brick and other solid masonry units with solidly filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
2. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed cross webs in mortar in starting course and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced and filled with grout.
3. Maintain joint widths except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.
4. Tool exposed joints slightly concave, except as otherwise shown.
5. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials.
6. Rake-out joints 1/2" in glazed CMU or SGFT and point with pointing mortar selected by Architect.
7. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.
8. Remove mortar protruding into cells of CMU, which are to be grouted.

D. Stone Work: Set units in full bed of mortar with all vertical joints full. Fill dowel, anchor and similar holes solid. Wet joint surface thoroughly before setting; for surfaces which are soiled, clean bedding and exposed surfaces with fiber brush and soap powder followed by thoroughly rinsing with clear water.

1. At copings and sills and where stone joints are shown to be sealed or caulked, install head joints free of mortar.

E. Composite Walls:

1. Fill the vertical, longitudinal joint between wythes (collar joint) solidly with mortar by parging the in-place wythe and shoving units into the parging.
2. Provide weephole ventilator in head joints of exterior wythe of composite wall located immediately above ledges and flashing, spaced maximum 2'-0" o.c. and recess 1/8" from face of masonry.
3. Install weephole ventilation so that the back of the ventilation comes into contact with the interior wythe surface

F. Cavity Walls:

1. Keep cavity clean of mortar droppings and other materials during construction.
2. Tie exterior wythe to back up with continuous horizontal joint reinforcing as specified.
3. Provide weephole ventilator in head joints of exterior wythe of cavity wall located immediately above flashing, spaced maximum 2'-0" o.c. and recess 1/8" from face of masonry.
4. Install weephole ventilation so that the back of the ventilation comes into contact with cavity drainage material surface.
5. Cut units of insulation to fit tight to each other, reinforcing and abutting construction, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face or attach to inside face with plastic fasteners secured to wire ties. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
6. Install mortar collection device at all through wall flashing locations. Provide units the full width of the cavity with end butted to provide continuous coverage and provide paths for moisture to reach weeds.
7. Add a minimum of 1" airspace or an insulated drainage board.

G. Stopping and Resuming Work:

1. Rake back 1/2 unit length for one half running bond or 1/3-unit length for one-third running bond in each course; do not tooth, stop and resume brickwork at expansion joints and CMU work at control joints. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

H. Built-In Work:

1. As the Work progresses, build in items specified under this and other Sections and as required to complete the Project. Fill in solidly with masonry around built-in items.
2. Fill space between hollow metal frames and masonry solidly with mortar.
3. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
4. Fill cores in hollow units with grout minimum 3 courses (24") under bearing plates, beams, lintels, posts and similar items unless otherwise indicated.



I. General:

1. Place all anchors and ties, for secure anchorage and bonding of masonry.
2. Install anchors, ties and joint reinforcement to achieve full mortar encapsulation. Lap joint reinforcement minimum of 6 inch at end of 10 foot – 0 inch sections.
3. Embed anchors and ties at least ½ inch in mortar of outer face shell of hollow units and 1-1/2 inch in mortar of solid masonry.
4. Provide minimum of 5/8 inch mortar cover for anchors, ties, and longitudinal wires of joint reinforcement when exposed to earth or weather and ½ inch mortar cover when not exposed to earth or weather.
5. Do not disturb or bend ties or anchors after embedding in grout or mortar.
6. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
7. Provide continuity at corners and wall intersections by use of prefabricated “L” and “T” sections for single wythe CMU walls.

J. Anchors:

1. Anchor masonry to structural members as detailed on drawings, such members to comply with the following:
  - a. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
  - b. Anchor masonry to structural members with metal anchors embedded in masonry joints and attached to structure.
  - c. Space anchors as indicated, but not more than 16” O.C. vertically and 32 inch O.C. horizontally.

K. Ties and Joint Reinforcement:

1. Bond masonry wythes with ladder type wire reinforced unit adjustable two-piece wall tie of wire size W1.7 spaced at 16 inch O.C. vertically and horizontally with a minimum of one anchor for each 2.67 ft.<sup>2</sup> of wall area. An adjustable wall tie shall have a maximum offset of 1 ¼ inch.

L. Control and Expansion Joints:

1. General: Provide and horizontal and vertical expansion, control and isolation joints in masonry where shown. Build-in related masonry accessory items as the masonry work progresses. Do not span joint reinforcement or other obstructions through movement joints unless provisions are made to prevent in-plane restraint of wall movement.
2. Vertical and Horizontal Expansion Joints in Brick: Leave joints open for installation of backer rod and sealant

3. Control Joints in concrete block: Install preformed control joint gaskets designed to fit standard sash block where indicated on drawing or form a continuous vertical joint in CMU and rake mortar joint back  $\frac{3}{4}$ " and seal.

M. Lintels:

1. Install steel lintels.
2. Provide masonry lintels where shown and wherever openings of more than 1'0" are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Thoroughly cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
  - a. Unless otherwise shown, provide one horizontal reinforcing bar for each 4" of wall thickness, of size number not less than the number of feet of opening width.
  - b. For hollow masonry unit walls, use specially formed U-shaped lintel units with reinforcing bars and filled with grout.
  - c. Provide 8" minimum bearing at each jamb.

N. Flashing:

1. Provide flashing in masonry work at, or above, all shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Seal penetrations in flashing with material recommended by flashing manufacturer before covering with mortar.
2. Prepare surfaces to be smooth and free from projections which might puncture flashing.
3. Where horizontal surfaces of cast in place concrete are irregular or not level, provide a thin leveling bed of mortar before installing flashing.
4. At lintels and shelf angles, install flashing on steel surface with no mortar joint above or below.
5. At masonry and concrete surfaces, install flashing with a full bed of mortar between flashing and course above. Seal flashing penetrations with mastic before covering with mortar
6. Install rubberized asphalt flashing to comply with manufacturer's instructions and as follows:
  - a) Where indicated, install stainless steel drip edge to extend the drip strip a minimum of  $\frac{1}{4}$  inch beyond the face plane of the brick wall, unless otherwise indicated. Install the drip edge on top of the lintel or shelf angle set into a continuous bed of adhesive. Lap end joints of drip edge by overlapping not less than 2 inch and sealing lap with elastic sealant.
  - b) Apply primer to all material in contact with flashing to maximize adhesion of through-wall flashing.
  - c) Verify the width of flashing pieces to be installed by field measurement.
  - d) Flashing should extend, uninterrupted, from outer wythe of masonry into the concrete masonry back-up.
  - e) Carefully fit flashing around projections, columns, walls, etc. Install flashing continuous around inside and outside corners using

prefabricated corner boots. Form membrane to correct profile without wrinkles or buckles, and protect from entering the wall to the outside.

- f) Extend flashing to within ½ inch of the outside face of wall and adhere to drip edge or terminate as detailed on the drawings.
- g) Terminate interior leg of flashing by extending flashing 4 inches into CMU backing wythe.
- h) Provide prefabricated end dams at termination of all flashing at columns, ends of lintels, inner corners or similar end conditions.
- i) Lap flashing joints a minimum of 6", set in mastic recommended by manufacturer and press tightly to seal.

### 3.4 INSTALLATION OF REINFORCED UNIT MASONRY

- A. Install reinforced unit masonry to comply with requirements of TMS 602/ACI 530.1/ASCE 6 Current Edition.
- B. Construct formwork and shores to support reinforced masonry elements during construction. Construction formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
- D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- E. Terminate all grout lifts 1-1/2 inches above the mortar joint at the bottom of the concrete masonry unit to form a grout key.

### 3.5 REPAIR, POINTING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. During the tooling of joints, enlarge voids or holes, except weepholes, and completely fill with mortar.
- C. Point up all joints at corners, openings and adjacent Work to provide a neat, uniform appearance, prepared for application of caulking or sealants.

### 3.6 CLEANING

- A. Cleaning Exposed, Concrete Masonry, including ground face, glazed CMU and SGT surfaces: Wipe off excess mortar as the Work progresses. Dry brush at the end of each day's Work.
  
- B. Final Cleaning of Brick Work:
  - 1. After mortar is thoroughly set and cured, clean sample wall area of approximately 20 sq. ft. as follows. Obtain Architect's acceptance of sample cleaning before proceeding to clean rest of masonry work.
  - 2. Protect stone and non-masonry surfaces from contact with cleaner.
  - 3. Mix and apply the cleaning agent as recommended by the manufacturer.
  - 4. Working areas not larger than 150 sq. ft. at a time, thoroughly wet the masonry surface.
  - 5. Apply the cleaning solution liberally with a natural fiber brush.
  - 6. Allow cleaning solution to remain on the wall for approximately 5 minutes. Do not allow the cleaning solution to dry on the wall.
  - 7. Scrape off excess mortar deposits. Use of metal scrapers is discouraged. Use of wire brushes is forbidden.
  - 8. Reapply cleaning solution.
  - 9. Rinse thoroughly with fresh water at a pressure not to exceed 300psi with fan tipped nozzle.
  - 10. When working from staging, keep area below surface wet.

END OF SECTION

**SECTION 09260**  
**GYP SUM BOARD SYSTEMS**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Gypsum board systems indicated and as specified.

SUBMITTALS

- B. Product Data: Submit copies of manufacturer's product specifications and installation instructions for each gypsum drywall product required, including other data as may be required to show compliance with these Specifications.
- C. LEED Submittals:
1. Credit MR 4.1[ and Credit MR 4.2]: Submit product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
  2. Credit MR 5.1[ and Credit MR 5.2]: Submit product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
  3. Credit EQ 4: Submit certification stating all adhesives and sealants installed in the building interior (defined as inside of the weatherproofing system and applied on-site) shall meet testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
  4. Credit EQ 4: Submit certification stating all gypsum board and insulation installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.

QUALITY ASSURANCE

- D. Fire-Resistive Rating: Where indicated for fire-resistance ratings, provide materials and installations identical with applicable assemblies, which have been tested per ASTM E 119 and listed by a testing laboratory recognized by authorities having jurisdiction.
- E. References:
1. Steel Framing Standard: Comply with applicable requirements of ASTM C 754 for installation of steel framing for gypsum board and as specified.
  2. Gypsum Board Standard: Comply with applicable requirements of ANSI/ASTM C 840 for application and finishing of gypsum board and as specified.

- F. Allowable Tolerances: 1/16" offsets between planes of board faces, and 1/8" in 8'-0" for plumb, level, warp and bow.

#### DELIVERY, STORAGE AND HANDLING

- G. Deliver materials in manufacturer's unopened containers, packages or bundles identified with manufacturer's name, brand, type and grade. Store inside in a dry area and protect from dampness and deterioration. Protect ready-mixed compounds (if any) from freezing.

#### PROJECT CONDITIONS

- H. Environmental Requirements: Maintain interior ambient temperatures at not less than 55 degrees F. for a period of at least 48 hours prior to application of gypsum board and joint treatment application, during application, and subsequently until joint treatment materials are dry. Ventilate as required.

## PART 2 - PRODUCTS

### 1.2 STEEL FRAMING COMPONENTS

- A. General: Provide components complying with ASTM C 754 for conditions indicated.
- B. Cast-in-Place and Post installed Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires, and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined by testing according to ASTM E 488 conducted by a qualified independent testing agency.
  - 1. Cast-in-place type designed for attachment to concrete forms.
  - 2. Chemical anchor.
  - 3. Expansion anchor.
- C. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190 conducted by a qualified independent testing agency.
- D. Wire Ties: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.162-inch (4.1-mm) diameter.
- E. Wire Hangers: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.162-inch (4.1-mm) diameter.
- F. Channels: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, and as follows:
  - 1. Carrying Channels: 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (70 kg/100 m), unless otherwise indicated.
  - 2. Furring Channels: 3/4 inch (19.1 mm) deep, 300 lb/1000 feet (45 kg/100 m), unless otherwise indicated.

3. Finish: Rust-inhibitive paint, except ASTM A 653, G 60 (ASTM A 653M,Z 180) hot-dip galvanized coating for framing for exterior soffits and where indicated.

G. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal, width and limiting heights. Limiting heights are based on using 16" o.c. stud spacing with 1/2" thick Gypsum board panels and 5 psf load perpendicular to partition or furring with an allowable deflection of L/360.

1. Thickness, Width and Limiting Height:

Stud Width & Thickness	Limiting Height with One Layer of Gyp. Bd. Each Side
(0.0179") 25 ga.	
2 1/2"	9'-10"
3 5/8"	12'-4"
4"	13'-4"
6"	17'-11"

- a. Where abuse-resistive gypsum fiber panels are to be used, minimum 0.0312 inch (20 gauge).
- b. At all door or borrowed lite jambs, use minimum 0.0312-inch (20 gauge).
  2. Protective Coating: Manufacturer's standard corrosion-resistant coating for exterior soffits and ceiling suspension members.
  3. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.
  4. Stiffeners: 3/4" cold-rolled steel channels at 0.3 lb. Per ft., rust-inhibitive paint finish.
  5. Stud System Accessories: Provide stud manufacturer's standard clips, shoes, ties, reinforcements, fasteners and other accessories as needed for a complete stud system.

H. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (45 kg/100 m), unless otherwise indicated.

I. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M), length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:

1. Thickness: 0.027 inch (0.7 mm) where indicated.

J. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

K. Firestop Track System: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly

indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Available Product: Subject to compliance with requirements, products that may be incorporated into the Work if required by the firestop assembly, include, but are not limited to, the following:
  - a. Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
  - b. Metal-Lite, Inc.; The System.
  - c. Equal.

#### GYPSUM BOARD PRODUCTS

- L. Exposed Gypsum Board: Comply with ASTM C 36.
  1. Type X: Provide Type X where required to achieve indicated fire-resistance ratings and where shown.
  2. Sheet Size: 4' wide x maximum length available which will minimize the number of end joints in the work.
  3. Sag-resistant type for ceiling surfaces.
- M. Gypsum Backing Board: Comply with ASTM C 36. Provide Type X where required to achieve indicated fire-resistance ratings and where shown.

#### TRIM ACCESSORIES

- N. Trim: Paper-faced metal for taping.

#### MISCELLANEOUS MATERIALS

- O. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  1. Provide all adhesives installed in the building interior (defined as inside of the weatherproofing system and applied on-site) meeting the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
- P. Spot Grout: ASTM C 475, setting-type joint compound of type recommended for spot grouting hollow metal doorframes.
- Q. Firestopping Pad: International Protective Coating Inc.; FSP 1077 Flame Safe Pads.
- R. Screws: ASTM C 1002, except ASTM C-954 for fastening to steel thicker than 0.033 inch (0.84 mm)
- S. Concealed Acoustical Sealant: Non-drying, non-hardening, non-skinning, non-staining, non-bleeding, gunnable sealant.



1. Provide Sealants installed in the building interior (defined as inside of the weatherproofing system and applied on-site shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic emissions from Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
- T. Sound Attenuation Blankets: Unfaced mineral fiber blanket insulation produced by combining mineral fibers manufactured from slag wool or rock wool as required to achieve required acoustical and fire rating for the assembly, with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).

#### JOINT TREATMENT MATERIALS

- U. General: Provide joint treatment materials and systems complying with ASTM C-475 and the recommendations of both the manufacturer of the board and joint treatment materials for reach application.
- V. Joint Tapes: Paper reinforcing tape complying with ASTM C 475.
- W. Joint Compound: ASTM C 475, dry powder type compound ready for mixing with water, or ready-mixed type adhesive ready for application, at Installer's option.
1. Provide drying type compound or setting type compound for the entire system except where otherwise specified or recommended by the board manufacturer.
  2. Provide exterior chemical-hardening type, which is moisture-resistant and recommended by the manufacturer for use on exterior gypsum boards.
  3. Provide setting type compound on abuse resistant board.
- X. Tile Backer Board Finish Materials: Tape and joint compounds as recommended by board manufacturer.

### PART 3 - EXECUTION

#### 1.3 INSTALLATION OF METAL SUPPORT SYSTEMS

- A. General: Comply with ASTM C 754 and C840 and as further specified.
- B. Support Suspension Systems:
1. Furnish and install hanger devices in coordination with other work.
  2. Secure hanger wires to structural support by wire-tying directly to structure where possible; otherwise, tie to inserts, clips or other anchorage devices or fasteners. Wire-tie hanger wires to main runners.
  3. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting

structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
5. Space main runners 4'-0" o.c. and space hangers 4'-0" along runners, except as otherwise shown.
6. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
7. Wire-tie or clip furring members to main runners and to other structural supports.
8. Space furring member 16" o.c., except as otherwise indicated closer.
9. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.
10. For exterior soffits, provide cross bracing and additional framing required to resist wind uplift.

C. Wall/Partition Support Systems:

1. Install supplementary framing, solid blocking and bracing to support fixtures, equipment, services, heavy trim, furnishings, woodwork, accessories and similar work.
2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Cut studs 1/2" short of full height.
3. Install runner tracks where gypsum drywall stud system abuts other work.
4. Terminate partition stud system at underside of construction above, except where indicated. Provide bracing to structure above in long runs and elsewhere where required but not less than 16 foot centers.
5. Space studs 16" o.c., except as otherwise indicated closer.
6. Fasten studs only at ends of floor and ceiling runner tracks by installing a screw into both flanges at each end.
7. Install horizontal stiffeners in stud system faced on one side only; space 4'-0" o.c. vertically; wire-tie at each intersection.
8. Secure jamb studs to frames of openings with screws, wire- ties or welds, either directly to frames or to special frame-support brackets; and install runner track sections (for jack studs) above and below openings, secured to jamb studs.

- a. Space jack studs same as partition studs, and screw to runner tracks above and below.
- b. Install 2 studs at each jamb of each opening.
- c. Install horizontal stiffeners 6" above and 6" below each opening more than 3'-0" wide, and extend 2 regular stud spaces beyond each jamb.

D. Exterior Wall Insulation System:

1. Fill all voids and spaces between studwork with blanket or spray foam insulation. Cut blanket insulation to provide friction fit and to provide complete coverage.
2. Cover surface with vapor barrier draped from top in as long lengths as practical. Lap and join over studs and seal with pressure sensitive vapor retardant tape.
3. Extend vapor retarder to extremities of exterior insulated walls and to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose thermal insulation.
4. Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16 inches on center.
5. Seal joints in vapor retarder caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with cloth or aluminized tape which bonds permanently to vapor retarder.
6. Repair any tears or punctures in vapor retarder immediately before concealment by application of gypsum board or other construction.

#### INSTALLATION OF GYPSUM BOARD

E. Preparations and Coordination:

1. Prior to the start of installation of gypsum board, meet at the Project Site with the installers of related work including work requiring openings, chases, frames, access panels, support and similar integrated requirements (including mechanical and electrical work). Review areas of potential interference and conflicts, and coordinate layout and sequencing requirements for proper integration of the work.
2. Do not proceed with gypsum board installation until blocking, framing, bracing and other supports for subsequently applied work have been installed.
3. Do not install gypsum board until thermal insulation to be concealed by board has been installed.
4. Install sound attenuation blankets where indicated and where required to achieve fire-resistance ratings, before installation of gypsum board unless blankets can be readily installed after board has been installed.

F. Basic Installation Requirements:

1. Comply with requirements for fire-resistance ratings.
2. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1'-0" in alternate courses of board.
3. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
4. Apply board vertically, one-piece full height. Locate edge end joints over supports. Position boards so that both tapered edge joints abut, and mill-cut or field-cut end joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
5. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
6. After scoring face paper and breaking core, cut back paper; do not tear or snap. Bevel panel ends 1/8" at 45° angle with sharp knife.
7. Do not locate joints within 8" of corners or openings. Where necessary, place a single vertical joint over the center of wide openings.
8. Install gypsum board on both faces of steel stud partition framing above ceilings.
9. Provide perimeter isolation where partitions abut structural elements. Allow not less than 1/4", not more than 3/8" gap between gypsum and structure. Finish edges of face layer with J-type (semi-finishing) casing bead. Seal space between casing bead and structure with continuous acoustical sealant bead. Attach gypsum board to studs not less than 1/2" below bottom edge of ceiling track flanges and to first stud adjacent to vertical tracks. Do not attach board directly to tracks.
10. At partitions, provide continuous beads of acoustical sealant at juncture or both faces of runners of plates with floor and ceiling construction, and wherever work abuts dissimilar materials. Seal prior to installation of gypsum boards.
11. At ceilings, provide continuous beads of acoustical sealants wherever work abuts dissimilar materials.
12. Wrap all electrical and communication boxes and all other back-boxes to completely close up all openings and joints with firestopping pads in rated construction and with Polybutene-Butyl tape such as "Elixir" by Creative Resource Services (630) 325-8340 in non-rated construction.
13. At openings and cutouts, fill open spaces between edges of gypsum board and fixtures, cabinets, ducts and other flush or penetrating items, with continuous bead of acoustical sealant.
14. Install sound attenuation blankets, in partitions where indicated. Completely blanket space between studs to full height of partitions. Fit carefully behind electrical outlets and other work which penetrates partitions. Attach to back face of gypsum board in accordance with manufacturer's instructions.

15. Unless otherwise specifically shown, continue all sound attenuation blankets and gypsum board above ceiling to provide complete closure. Fit tight to abutting and penetrating construction and seal.
  16. Fill joint between tracks and abutting construction with safing insulation.
  17. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations and requirements of fire rating design (if any), but not less than 12" o.c. except 8" o.c. for abuse resistant board (if any) and the backer board.
- G. Control Joints: Provide control joints at maximum 30 foot spacing located at door jamb or window jamb studs where practical. Provide on both sides of partitions. Install in accordance with ASTM C840 and manufacturer's recommendations.
- H. Grouting Frames:
1. Where grouting is indicated, fully grout frames with stiff gypsum grout to depth of clip before installing jamb stud.
  2. Where grouting is not indicated, spot grout by applying gypsum grout or joint compound just before inserting gypsum board sheet.
- I. Ceilings:
1. Apply exposed gypsum board on ceilings, before applications on walls and partitions, to the greatest extent possible.
  2. Apply in direction which will minimize end joints.
  3. Fasten with screws.
  4. Where gypsum board ceiling is shown as base for adhesively-applied acoustical ceiling tile, install gypsum backing board, with end joints staggered over supports.
- J. Single-Layer Walls and Partitions:
1. Apply sheets vertically and provide full height sheet lengths.
  2. Locate edge joints over supports; stagger joints over supports on opposite sides of partitions.
  3. Fasten with screws.
  4. Except where otherwise specified or indicated, where drywall is base for thin-set ceramic tile and similar rigid applied wall finishes, install water-resistant gypsum backing board to comply with ASTM C 840 and recommendations of gypsum board manufacturer.
  5. At showers, (tubs) and where indicated, install tile backer board and treat joints to comply with manufacturer's recommendations for type of application indicated.
- K. Double-Layer Walls and Partitions:
1. Install base layer of gypsum backing board (or exposed gypsum board, at Installer's option), and face layer of exposed gypsum board. Apply both layers vertically, with joints of base layer over supports and joints of face layer offset at least 10" with base layer joints. Provide full height sheet lengths.

2. Fasten base layer with screws.
3. Fasten face layer with screws through base layer and into supports or laminating adhesive. Brace to temporarily fasten face layer until adhesive has dried.
4. Supplement adhesive with permanent screw fastening of face layer through base layer and into supports.

#### INSTALLATION OF TRIM ACCESSORIES

- L. Coordinate the installation of trim accessories with the installation of gypsum board. Use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports.
- M. Install paper tape-in type metal corner beads at external corners of drywall work.
- N. Install paper tape-in type metal edge trim wherever edge of gypsum board would otherwise be exposed or semi-exposed.
  1. Install L-type trim-beads (for joint compound) where edge is shown to be tightly fitted to abutting work (without reveal or sealant pocket).
  2. Install U-type trim-beads (for joint compound) where edge is not tightly fitted to abutting work (exposed, revealed, sealant pocket, gasketed, or other separation), except as otherwise indicated.

#### FINISHING

- O. Comply with manufacturer's instructions for the mixing, handling and application of materials. Machine or hand application is Installer's option. Apply treatment at joints both directions, flanges of trim accessories, penetrations of the gypsum board (electrical boxes, piping and similar work), fastener heads, surface defects and elsewhere as indicated; and apply in the manner which will result in each of these being concealed when applied decoration has been completed.
- P. Where open joints of more than 1/16" occur, including edges of boards with rounded or beveled corners, prefill joint with special chemical-hardening-type bedding compound, prior to bedding of joint tape.
- Q. Comply with the requirements for a level 4 finish except where otherwise specified. Embed tape in joint compound in all joints and interior angles and apply two (2) additional separate coats of joint compound over all flat joints and one separate coat of joint compound overall interior angles. Cover fastener heads and accessories with three separate coats of joint compound. Provide compound free of tool marks and ridges and the Gypsum board surface free of joint compound. Smooth compound by wiping with a damp sponge.
- R. Where water resistant gypsum board is indicated as a base for ceramic tile and similar rigid applied finishes, finish joints with tape and setting. Tape joint compound to comply with gypsum board manufacturer's recommendations.
- S. Where tile backer board is indicated as a base for ceramic tile tape and finish joints in accordance with recommendations of the manufacturer of the selected backer board.
- T. Where gypsum board is indicated as a base for the adhesive-application of wall coverings, comply with manufacturer's instructions for applying joint compound and joint tape in minimum

thicknesses over end-joints and cut-joints, so as to avoid a build-up of tape and compound which would telegraph through. Select topping coat for maximum strength and bond with gypsum board.

- U. Partial Finishing: Omit third coat and sanding on concealed drywall construction which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

END OF SECTION

## SECTION 01352

### LEED REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain LEED certification based on LEED for Schools.
1. This project will track specific LEED parameters identified herein but will not seek LEED certification.
  2. Materials data and information is to be tracked by the Contractor using tracking forms include in Appendix A.
  3. Monthly status report with updates to these tracking forms is required.
  4. Backup information is to be maintained by the Contractor.
- B. Related Sections:
1. Divisions 1 through 16 Sections for LEED requirements specific to the work of each of these Sections. Requirements in other specification divisions may or may not include reference to LEED. It is strongly encouraged that ALL div1-16 subcontractors be provided with, and made to understand the requirements described within this section.

##### 1.2 DEFINITIONS

- A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- B. LEED: Leadership in Energy & Environmental Design.
- C. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
- D. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.



2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

### 1.3 SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
- B. LEED submittals are in addition to other submittals where such submittals are required. .
- C. Project Materials Cost Data: Provide statement indicating total cost for building materials used for Project, excluding mechanical, electrical, and plumbing components, and specialty items such as elevators and equipment. Include statement indicating total cost for wood-based materials used for Project.
- D. LEED Action Plans: Required only as necessary to meet associated City and other regulatory requirements.
- E. .
- F. LEED Progress Reports: Concurrent with each Application for Payment, submit reports providing the status of actual construction and purchasing activities for the following:
  - 1.
  2. Credit MR 2.: Waste reduction progress reports complying with Division 1 Section "Construction Waste Management."
  3. Credit MR 4.: Recycled content.
  4. Credit MR 5.: Regional materials.
  5. Credit MR 7: Certified wood products.
  6. Credit EQ 4: Low-Emitting materials
- G. LEED Documentation Submittals:
  1. Credit SS 7.2: Product Data for roofing materials indicating Solar Reflectance Index compliance for non-vegetated roof systems.
  4. WE 3.1/3.2/3.3: Product Data for plumbing fixtures indicating flow rate (gallons per flush or gallons per minute).
  5. Credit MR 2.: Narrative of intended compliance with Division 1 Section "Construction Waste Management."
  6. Credit MR 4.: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
  7. Credit MR 5.: Product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
  8. Credit MR 7: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product. Include statement indicating total cost of wood products.

- a. Provide documentation confirming that smoking was not allowed inside the building during construction. (no smoking on CPS property is a CPS requirement)
9. Credit EQ4.: Low-Emitting Materials
- a. Option 1: Adhesives & Sealants (1 point): Submit Certification demonstrating that all adhesives and sealants installed in the building interior (defined as inside of the weatherproofing system and applied on-site) shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing Of Volatile Organic Emissions From Various Sources using Small-Scale Environmental Chambers*, including 2004 Addenda.
  - b. Option 2: Paints & Coatings (1 point): Submit Certification Demonstrating that all paints and coatings installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources using Small-Scale Environmental Chambers*, including 2004 Addenda.
  - c. Option 3: Flooring Systems (1 point): Submit Certification demonstrating that all flooring elements installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
  - d. Option 4: Composite Wood and Agrifiber Products (1 point): Submit Certification demonstrating that all composite wood and agrifiber products installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 addenda.
  - e. Option 5: Furniture & Furnishings (1 point): Submit Certification demonstrating that Classroom furniture including all student and teacher desks, tables, and seats introduced into the project space that has been manufactured, refurbished or refinished within one year prior to occupancy must meet one of the requirements below. Salvaged and used furniture that is more than one year old at the time of occupancy is excluded from the credit requirements.

Method A: GREENGUARD Children & Schools Certified

OR

Method B: Calculated indoor air concentrations that are less than or equal to those established in table 1 for furniture systems and seating determined by a procedure based on the U.S. Environmental Protection Agency’s Environmental Technology Verification (ETV) Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol conducted in an independent air quality testing laboratory.

Table 1: Indoor Concentrations

Chemical Containment	Emission Limits Classroom Furniture	Emission Limits Seating
TVOC	0.5 mg/m <sup>3</sup>	0.25 mg/m <sup>3</sup>
Formaldehyde	50 parts per billion	25 parts per billion

Total Aldehydes	100 parts per billion	50 parts per billion
4 – Phenylcyclohexene (4-PCH)	0.0065 mg/m <sup>3</sup>	0.00325 mg/m <sup>3</sup>

OR

Method C: Calculated indoor air concentrations that are less than or equal to those established in Table 1 for furniture systems and seating determined by a procedure based on BIFMA M7.1-2005 and X7.1-2005 testing protocol conducted in an independent third party air quality testing laboratory.

10. Option 6: Ceiling and Wall Systems (1 point): Submit Certification demonstrating that all gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
10. Contractor will maintain LEED documentation to demonstrate compliance with the following LEED credits: MRC2.1/2.2, MRc4.1/4.2, MRc5.1/5.2, MRc7, EQc4.1/4.2/4.3/4.4 and will track this information in forms provided as part of Appendix A.

1.4 QUALITY ASSURANCE

PART 2 - Maintain submittals / information as backup in an organized manner for Owner and/or Architect information and use should this be required. PRODUCTS

2.1 RECYCLED CONTENT OF MATERIALS

- A. Credit MR 4.: Provide building materials with recycled content, and track post-consumer recycled content plus one-half of pre-consumer recycled content for all materials specified in Division 2-10.
  1. Cost of post-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
  2. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
  3. .

2.2 REGIONAL MATERIALS

- A. Credit MR 5.: Provide building materials (by cost) that are regional materials. .

### 2.3 CERTIFIED WOOD

- A. Credit MR 7: Provide wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

### 2.4 LOW-EMITTING MATERIALS

- A. Credit EQ 4: Comply with a minimum of four of the following six options:
- B. Option 1: Adhesives & Sealants (1 point): all adhesives and sealants installed in the building interior (defined as inside of the weatherproofing system and applied on-site) shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing Of Volatile Organic Emissions From Various Sources using Small-Scale Environmental Chambers*, including 2004 Addenda.
- C. Option 2: Paints & Coatings (1 point): all paints and coatings installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources using Small-Scale Environmental Chambers*, including 2004 Addenda.
- D. Option 3: Flooring Systems (1 point): all flooring elements installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
- E. Option 4: Composite Wood and Agrifiber Products (1 point): all composite wood and agrifiber products installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 addenda.
- F. Option 5: Furniture & Furnishings (1 point): Classroom furniture including all student and teacher desks, tables, and seats introduced into the project space that has been manufactured, refurbished or refinished within one year prior to occupancy must meet one of the requirements below. Salvaged and used furniture that is more than one year old at the time of occupancy is excluded from the credit requirements.

Method A: GREENGUARD Children & Schools Certified

OR

Method B: Calculated indoor air concentrations that are less than or equal to those established in table 1 for furniture systems and seating determined by a procedure based on the U.S. Environmental Protection Agency's Environmental Technology Verification (ETV) Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol conducted in an independent air quality testing laboratory.

Table 1: Indoor Concentrations

Chemical Containment	Emission Limits Classroom Furniture	Emission Limits Seating
TVOC	0.5 mg/m <sup>3</sup>	0.25 mg/m <sup>3</sup>
Formaldehyde	50 parts per billion	25 parts per billion
Total Aldehydes	100 parts per billion	50 parts per billion
4 – Phenylcyclohexene (4-PCH)	0.0065 mg/m <sup>3</sup>	0.00325 mg/m <sup>3</sup>

OR

Method C: Calculated indoor air concentrations that are less than or equal to those established in Table 1 for furniture systems and seating determined by a procedure based on BIFMA M7.1-2005 and X7.1-2005 testing protocol conducted in an independent third party air quality testing laboratory.

- G. Option 6: Ceiling and Wall Systems (1 point): all gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior shall meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
- H. The General Contractor shall review the manufacturers and products listed in the Technical Specifications, and verify compliance with the referenced Credit EQ 4 (California) standard. The Contractor shall obtain necessary manufacturer tests and certification to demonstrate compliance with the referenced standard. If such certification is not immediately available, the measures necessary to demonstrate compliance shall not impact project cost or schedule. If compliance cannot be met, the applicable guidelines below shall be used.
  - 1. Adhesives & Sealants: Provide product data and MSDS for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA Method 24). Comply with the following limits:
    - a. Wood Glues: 30 g/L.
    - b. Metal to Metal Adhesives: 30 g/L.
    - c. Adhesives for Porous Materials (Except Wood): 50 g/L.
    - d. Subfloor Adhesives: 50 g/L.
    - e. Plastic Foam Adhesives: 50 g/L.
    - f. Carpet Adhesives: 50 g/L.
    - g. Carpet Pad Adhesives: 50 g/L.
    - h. VCT and Asphalt Tile Adhesives: 50 g/L.
    - i. Cove Base Adhesives: 50 g/L.
    - j. Gypsum Board and Panel Adhesives: 50 g/L.
    - k. Rubber Floor Adhesives: 60 g/L.
    - l. Ceramic Tile Adhesives: 65 g/L.
    - m. Multipurpose Construction Adhesives: 70 g/L.
    - n. Fiberglass Adhesives: 80 g/L.
    - o. Contact Adhesive: 80 g/L.
    - p. Structural Glazing Adhesives: 100 g/L.
    - q. Wood Flooring Adhesive: 100 g/L.

- r. Structural Wood Member Adhesive: 140 g/L.
  - s. Special Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
  - t. Top and Trim Adhesive: 250 g/L.
  - u. Plastic Cement Welding Compounds: 350 g/L.
  - v. ABS Welding Compounds: 400 g/L.
  - w. CPVC Welding Compounds: 490 g/L.
  - x. PVC Welding Compounds: 510 g/L.
  - y. Adhesive Primer for Plastic: 650 g/L.
  - z. Sheet Applied Rubber Lining Adhesive: 850 g/L.
  - aa. Aerosol Adhesive, General Purpose Mist Spray: 65 percent by weight.
  - bb. Aerosol Adhesive, General Purpose Web Spray: 55 percent by weight.
  - cc. Special Purpose Aerosol Adhesive (All Types): 70 percent by weight.
  - dd. Other Adhesives: 250 g/L.
  - ee. Architectural Sealants: 250 g/L.
  - ff. Nonmembrane Roof Sealants: 300 g/L.
  - gg. Single-Ply Roof Membrane Sealants: 450 g/L.
  - hh. Other Sealants: 420 g/L.
  - ii. Sealant Primers for Nonporous Substrates: 250 g/L.
  - jj. Sealant Primers for Porous Substrates: 775 g/L.
  - kk. Modified Bituminous Sealant Primers: 500 g/L.
  - ll. Other Sealant Primers: 750 g/L.
2. Paints & Coatings: Provide product data and MSDS for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA Method 24). Comply with the following limits:
- a. Flat Paints and Coatings: VOC not more than 50 g/L.
  - b. Nonflat Paints and Coatings: VOC not more than 150 g/L.
  - c. Primers: VOC not more than 50 g/L.
  - d. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
  - e. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
  - f. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
  - g. Floor Coatings: VOC not more than 100 g/L.
  - h. Shellacs, Clear: VOC not more than 730 g/L.
  - i. Shellacs, Pigmented: VOC not more than 550 g/L.
  - j. Stains: VOC not more than 250 g/L.
3. Flooring Systems: Provide product data for carpet products showing compliance with the Carpet and Rug Institute's Green Label Plus program. Provide product data for vinyl, linoleum, rubber and laminate flooring showing compliance with the FloorScore program requirements.
4. Composite Wood and Agrifiber Products: Provide product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION WASTE MANAGEMENT

- A. Credit MR 2.: Comply with Division 1 Section "Construction Waste Management."

### 3.2 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

- A. Comply with the intent of LEED Credit EQ 3.1: Comply with ALL provisions of SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3."
  - 1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 1 Section "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
  - 2. Replace ALL air filters immediately prior to occupancy.
  - 3. No smoking is allowed within the building and within 25 feet of building entrances once the building is closed.

### 3.3 MATERIAL AND CONSTRUCTION PROTECTION

- A. Deliver, store and handle products and materials using methods that will prevent damage and deterioration and in accordance with manufacturer's recommendations. Deliver to minimize long term storage in undamaged condition in manufacturer's original unopened, undamaged containers complete with labels and instructions. Store products and materials subject to damage by the elements under cover in a weather tight enclosure above ground with ventilation adequate to prevent condensation. Protect from freezing and moisture intrusion.
- B. Inspect materials and products promptly upon arrival at the site for damage, soiling, contaminates and dampness and reject as appropriate.
- C. Provide protection during the construction process to prevent moisture intrusion, freezing, dirt and debris within assemblies and extremes in temperature not common to the in-place use environment of the element. Do not allow food and drink or food and drink containers or material protective wrapping to be incorporated into the Work.
- D. Install Work in sequence with sufficient time for curing and drying of each element before subsequent work upon which such work depends.
- E. Promptly take measures to dry or remove and replace materials products and portions of the project that evidence absorption of moisture or are wet before incorporation proceeding with the work and incorporation or of such materials or products into the project.

**LEED for Schools  
MATERIAL / PRODUCT SUBMITTAL  
EXAMPLE COVER SHEET**

**For Project:**  
**Chicago Public Schools – Southwest Area Middle School**

**Date: #####**

**SPECIFICATION # 04200: UNIT MASONRY  
ITEM: Mortar Net – 2”**

**REQUIRED LEED INFORMATION:**

**GENERAL INFORMATION**

<b>MATERIAL UNIT COST:</b>	<b>\$2000.00</b>
<b>UNIT TYPE &amp; QUANTITY (QUARTS, LBS, ETC)</b>	<b>250 LBS.</b>
<b>NUMBER OF UNITS:</b>	<b>2</b>
<b>TOTAL COST:</b>	<b>\$4000.00</b>
<b>VENDOR:</b>	<b>ABC CONST. SUPPLIES</b>
<b>INSTALLING CONTRACTOR:</b>	<b>XYZ MASONRY</b>
<b>MANUFACTURER:</b>	<b>MORELAND NET, USA</b>

**MRc4.1 & 4.2 (all non-MEP div 2-10 materials)**

<b>RECYCLED CONTENT (post-consumer):</b>	<b>17%</b>
<b>RECYCLED CONTENT (post-industrial):</b>	<b>33%</b>
<b>RECYCLED CONTENT INFO SOURCE:</b>	<b>MORELAND NET, USA</b>

**MRc5.1 & 5.2 (all non-MEP div 2-10 materials)**

<b>LOCATION OF MANUFACTURE:</b>	<b>HIGHLAND, IN</b>
<b>DISTANCE TO PROJECT (miles):</b>	<b>32</b>
<b>LOCATION OF EXTRACTION:</b>	<b>NILES, IL</b>
<b>DISTANCE TO PROJECT (miles):</b>	<b>60</b>
<b>MANUF./EXTRACT. INFO SOURCE:</b>	<b>MORELAND NET, USA</b>

**MRc7 (all non-MEP div 2-10 materials)**

<b>% (by weight or cost) CERTIFIED WOOD:</b>	<b>N/A</b>
<b>CERTIFIED WOOD FSC #:</b>	<b>N/A</b>
<b>CERTIFIED WOOD INFO SOURCE:</b>	<b>N/A</b>
<b>FSC CERTIFICATE ATTACHED (Y/N):</b>	<b>N/A</b>

**EQc4.1, 4.2, & 4.3 (ALL div 2-16 adhesives, sealants, paint, & carpet within vapor barrier)**

<b>VOC DATA (grams per liter):</b>	<b>N/A</b>
<b>VOC DATA INFO SOURCE:</b>	<b>N/A</b>
<b>GREEN LABEL PLUS CARPET (Y/N):</b>	<b>N/A</b>
<b>GREEN LABEL INFO SOURCE:</b>	<b>N/A</b>

**EQc4.4 (all composite wood assembly products & materials)**

<b>NO UREA-FORMALDEHYDE RESINS:</b>	<b>N/A</b>
<b>INFO SOURCE:</b>	<b>N/A</b>

END OF SECTION 01352



## SECTION 01524

### CONSTRUCTION WASTE MANAGEMENT

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for Construction Waste Management.
- B. Related Sections
  - 1. Section 01352: LEED Requirements
  - 2. Section 02316: Landfill Requirements

##### 1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Refer to Section 02316 for landfill requirements.
- D. Recycle: Recovery of waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of waste and subsequent incorporation into the Work.

##### 1.3 PERFORMANCE REQUIREMENTS

- A. General LEED Credit MR 2.1, 2.2: Develop waste management plan that results in end-of-Project rates for salvage/recycling of minimum 75 percent by weight of total waste generated by the Work. Owner's goal is to salvage and recycle as much nonhazardous waste as possible including the following materials:
  - 1. Construction Waste:
    - a. Site-clearing waste.
    - b. Masonry and CMU.
    - c. Lumber.
    - d. Wood sheet materials.
    - e. Wood trim.
    - f. Metals.
    - g. Roofing.
    - h. Insulation.
    - i. Carpet and pad.

- j. Gypsum board.
- k. Piping.
- l. Electrical conduit.
- m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
  - 1) Paper.
  - 2) Cardboard.
  - 3) Boxes.
  - 4) Plastic sheet and film.
  - 5) Polystyrene packaging.
  - 6) Wood crates.
  - 7) Plastic pails.

#### 1.4 SUBMITTALS

- A. Waste Management Plan: Submit plan through CW within 7 days of the Notice to Proceed.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report via CW Include separate reports for demolition and construction waste. Include the following information:
  - 1. Material category.
  - 2. Generation point of waste.
  - 3. Total quantity of waste in tons (tonnes).
  - 4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
  - 5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
  - 6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
  - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for Substantial Completion, submit five (5) copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Submit indicating receipt and acceptance of salvageable waste donated to individuals and organizations if and when donations occur. Indicate whether organization is tax exempt.
- E. Records of Sales: Submit indicating receipt and acceptance of salvageable waste sold to individuals and organizations if and when sales occur. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Submit record indicating receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices. Submit concurrently with waste reduction progress reports.
- G. Landfill and Incinerator Disposal Records: Submit record indicating receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices. Submit concurrently with waste reduction progress reports.
- H. LEED Submittal: Tabulate total waste material, quantities diverted and means by which it is diverted, and provide supplementary narrative statement clarifying the requirements for the

credits have been met. Maintain all tickets and provide a narrative clarifying any discrepancy between total tickets and reported diverted materials.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

## 1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for building demolition (if any) and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
  - 1. Total quantity of waste.
  - 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
  - 3. Total cost of disposal (with no waste management).
  - 4. Revenue from salvaged materials.
  - 5. Revenue from recycled materials.
  - 6. Savings in hauling and tipping fees by donating materials.
  - 7. Savings in hauling and tipping fees that are avoided.
  - 8. Handling and transportation costs. Include cost of collection containers for each type of waste.

9. Net additional cost or net savings from waste management plan.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 PLAN IMPLEMENTATION**

- A. General: Implement waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
  1. Distribute waste management plan to everyone concerned within three days of submittal return.
  2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

### **3.2 RECYCLING, GENERAL**

- A. General: Recycle paper and beverage containers used by on-site workers in addition to construction waste.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. Waste may be co-mingled at the site and separated at a recycling facility.
  1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

### 3.3 RECYCLING CONSTRUCTION WASTE

#### A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

#### B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

1. Comply with requirements in Division 2 Section "Landscaping" for use of chipped organic waste as organic mulch.

#### C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

#### D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

### 3.4 DECONSTRUCTION

- A. If demolition efforts include work and removal of materials by a Deconstruction training program, obtain records of materials diverted from landfill through deconstruction and reuse.

### 3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Refer to Section 02316 for landfill and disposal of waste materials

- B. Burning: Do not burn waste materials.

- C. Disposal: Refer to Section 02316 for landfill and disposal of waste materials

**END OF SECTION**

**SECTION 06400**  
**ARCHITECTURAL WOODWORK**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Interior woodwork items indicated not specified elsewhere and as specified.
- B. Options:
  - 1. Where casework shown can be provided in the configurations and size shown, such case work may be provided as modular casework per the requirements of Section 06401.

1.2 SUBMITTALS

- A. Product Data: Submit complete printed data on all specified manufactured items.
- B. Shop Drawings: Submit Shop Drawings for shop fabricated items, showing location of each item, dimensioned plans and elevations, large scale details, anchors and other components. Indicate compliance with specified Standards and other specified requirements for materials and workmanship.
- C. Samples:
  - 1. Submit samples of laminate of colors and patterns selections by Architect.
  - 2. Submit solid wood for transparent finish, a set of 3 samples, minimum one foot long, each required configuration, each specie, showing extremes in color and grain.
  - 3. Submit solid wood for opaque finish, 3 samples, minimum foot long, each configuration.
  - 4. Submit panel products or veneer for transparent finish, 3 samples, 12" square, showing extremes in color, grain and characteristics.
  - 5. Submit samples, approximately 6" square full thickness corner sections of Epoxy tops having finish proposed for the project.

1.3 QUALITY ASSURANCE

- A. Fabricator/Installer: A firm which has successfully produced work similar to the quality specified and in the quantity shown for a period of not less than 5 years.
- B. Reference Standards: Comply with the applicable provisions for grading and workmanship of the "Architectural Woodwork Quality Standards", Version 1.0,

published by the Architectural Woodwork Institute (AWI) (herein referred to as Standards), except as otherwise specified.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Store woodwork materials and completed woodwork only in a dry, ventilated place, protected from the weather.
- C. Protect woodwork from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.
- D. Do not deliver woodwork until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas which meet the requirements specified for installation areas.

#### 1.5 JOB CONDITIONS

- A. Environmental Requirements: Do not start Work until room or space is at normal use temperature and humidity and wood has tempered to the room or space.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before on Shop Drawings.

#### 1.6 COORDINATION

- A. Coordinate and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.

## **PART 2 - PRODUCTS**

### 2.1 MATERIALS

- A. Plastic Laminate: Comply with the requirements of "Publication No. LD3" by the National Electrical Manufacturer's Association (NEMA), General-Purpose type (HGS), 0.048", except post formed type (HPG) for surfaces shown formed, 0.039". Colors, patterns and texture selected by the Architect.



1. Chemical-Resistant, High-Pressure Decorative Laminate: NEMA LD3, Grade HGP and Test Procedure 3.9.5:
    - a. Pionite Chemguard; Pionite.
    - b. Chemsurf; Wilsonart
  2. Backer Sheet: NEMA LD3, 0.028" VGS.
- B. Particle Board: ANSI A 208.1 composed of wood chips, medium (40-50 PSF) density, Grade M-2-Exterior Glue (no Formaldehyde), sanded faces, fire retardant treated where indicated, and where used as backing core of wall paneling (UL stamp for Class 1. rating).
- C. Hardboard: ANSI A 135.4, pressed wood fibers with resin binders, tempered grade, 1/4" thick unless shown otherwise, smooth two sides where exposed.
  1. Provide product that meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers*, including 2004 addenda.
  2. Submit documentation that particleboard is made of recycled content materials and meets LEED MR 4.1 and 4.2
- D. Fiberboard: ANSI A208.2 composed of wood reduced to fine fibers mixed with binders and formed into panels by heat and pressure, 37 to 50 lb./cu.ft. density, grade MD-exterior glue (no Formaldehyde).
  1. Provide product that meet the testing and product requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers*, including 2004 addenda.
  2. Submit documentation that particleboard is made of recycled content materials and meets LEED MR 4.1 and 4.2
- E. Thermoset Decorative Overlay Board: Particleboard specified above, or medium-density fiberboard specified above with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- F. Adhesives: Provide all adhesives installed in the building interior (defined as inside the weatherproofing system an applied on-site) that meet the testing and product requirements of the California Department of health Services Standard Practice for Testing of Volatile Organic Emissions from Various sources Using Small-Scale Environmental Chambers, including 2004 Addenda, or LEED Credit REQ 4.1
- G. Miscellaneous Accessories:
  1. Nails: Select the material, type, size and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
  2. Anchors:

- a. Select the material, type, size and finish required by each substrate for secure anchorage. Provide nonferrous metal plated or galvanized anchors.
  - b. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors.
3. Center Brackets: Combination shelf and closet pole support, wrought steel with enamel finish, BHMA B84052.
  4. Grommets: 1¼" diameter molded plastic with matching caps having slops for wire passage unless otherwise shown.
  5. Other Accessories: As indicated on the drawings.

## 2.2 FABRICATION

- A. Shop-fabricate to the greatest extent possible, disassemble only as necessary for delivery and installation.
- B. Install hardware at the shop prior to delivery. Remove hardware for finish application and reinstall after finishing.
- C. Fabricate shop built items with scribes to fit to existing construction.
- D. Standing & Running Trim:
  1. Conform to AWI Section 300, premium grade.
  2. Mill to profiles in the shop.
  3. Shop fabricate to the extent possible.
- E. Casework:
  1. Conform to AWI Premium Grade (Sec. 400) and as follows:
  2. Face Construction: "Half overlay" type, except as otherwise indicated.
  3. Thickness and Style: As shown, or if not shown, provide 3/4" thick doors, drawer fronts and fixed panels, except where required to be thicker by Standards; and provide flush units.
  4. Edges of Plastic Laminate Door, Drawers and Face Frame: 3 mil PVC, exposed surfaces.
  5. Backs of Plastic Laminate Doors: Plastic laminate matching exposed surfaces.
  6. Backs of Plastic Laminate Components (except doors): Provide full backer sheets.
  7. Interior Finish Plastic Laminate Casework: Thermoset Decorative Overlay Plastic Laminate (unless otherwise shown).
  8. Wood Casework Matching: Run and match grain vertically for drawer fronts, doors and fixed panels.

- a. Fabricate Work of each continuous casework unit from book matched, flitch-matched architectural plywood panel sets.
  9. Wood Casework Finish: AWI Section 1500 for complete factory application of finish system TR-4; conversion varnish, partially filled effect, satin sheen, stain selected by Architect. Provide specified finish inside and outside.
- F. Counter Construction:
1. As shown, or if details not shown, comply with Standards and provide 4" high back-splash and end-splash, top-mounted square butt joint, fully covered with matching plastic laminate, eased edges.
    - a. Provide backer sheet on all concealed, semi-exposed and exposed surfaces not covered with plastic laminate.
  2. Openings:
    - a. Cut openings for equipment to be installed. Comply with equipment manufacturer's requirements, but provide internal corners of 1/8" minimum radius. Smooth saw cut and ease edges.
  3. Counter Top Supports: Where counter top span exceeds 48", provide mid span support as shown, or if not shown provide painted triangular metal gusset support or Unistrut P1000 behind front edge of counter.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.

### **3.2 INSTALLATION**

- A. Basic Requirements:
  1. Install plumb, level, true and straight with no distortions. Shim as required using concealed shims.
  2. Cut to fit, unless specified to be shop-fabricated or shop-cut to exact size. Where woodwork abuts other finished Work, scribe and cut for accurate fit.
- B. Trim:
  1. Install in single, unjointed lengths for openings and for runs less than maximum length of lumber available. For longer runs, use only one piece less than maximum length available in any straight run. Stagger joints in adjacent members.
  2. Distribute defects allowed in the quality grade specified to the best overall advantage, when installing job assembled woodwork items.
  3. Cope moldings at returns and miter at corners.

4. Attach woodwork securely in place with uniform joints providing for thermal and building movements.
  5. Blind nail where possible. Use fine finishing nails where exposed. Set exposed nail heads.
  6. Screw to metal studs behind finish at each crossing. Countersink and plug with matching wood plugs glued and set flush.
- C. Casework - Shop Fabricated Items:
1. Install plumb, level, true and straight with no distortions. Shim as required using concealed shims.
  2. Where work abuts other finished work, scribe and cut for accurate fit. Before making cutouts, drill pilot holes at corners.
  3. Attach work securely in place with uniform joints providing for thermal and building movements. Secure to anchors or blocking built in or directly attached to substrates.
  4. Provide tops fabricated in largest sizes practical. Assemble in field with splines for alignment and drawn tight to hairline contact with tight-joint fasteners.
- D. Preparing for Finish: Clean woodwork (not shop finished) and fill nail holes in preparation for finishes specified for job-applied finish. Where woodwork is to receive a transparent finish, use matching wood filler, sand smooth.

### 3.3 CLEANING AND PROTECTION

- A. Repair or remove and replace defective work upon completion of installation.

END OF SECTION

## SECTION 09910

### FINISH PAINTING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes requirements for field painting of new construction including the following:
  - 1. Exterior and interior exposed items and surfaces.
  - 2. Priming, and finish coats in addition to shop priming and surface treatment specified in other Sections.
- B. Refer to Section 09901, "Renovation Painting" and Section 09910, "Surface Preparation for Renovation Painting".
- C. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
  - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

##### 1.2 DEFINITIONS

- A. Standard coating terms defined in ASTM D 16 apply to this Section.

##### 1.3 SUBMITTALS

- A. Submit three (3) drawdowns of each product and color combination. Drawdowns shall be applied using a 4 mil wet drawdown bar on Leneta form WD plain white coated cards size 3-7/8" x 6"
  - 1. Label each card with the following:
    - a. Job name
    - b. Date
    - c. Product name
    - d. Product number
    - e. Color number as stated in the color schedule
    - f. Name, address, and phone number of the supplying facility.

2. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
  3. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
- B. Qualification Data: When requested, submit qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. LEED Submittals: Submit data demonstrating that all paints and coatings installed in the building interior meets the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.

#### 1.4 REGULATORY REQUIREMENTS

- A. It shall be the responsibility of the contractor to comply with all applicable regulations, laws and building codes of all governing Federal, State and Local agencies.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required on the Project. Comply with procedures specified in PDCA P5. Duplicate finish of approved prepared samples.
1. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted.
  2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface according to the Schedule or as specified. Provide required sheen, color, and texture on each surface.
    - a. After finishes are accepted, the Architect will use the room to evaluate coating systems of a similar nature.
  3. Final approval of colors will be from job-applied samples.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Product name or title of material.

2. Product description (generic classification or binder type).
  3. Manufacturer's stock number and date of manufacture.
  4. Contents by volume, for pigment and vehicle constituents.
  5. Thinning instructions.
  6. Application instructions.
  7. Color name and number.
  8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

#### 1.7 PROJECT CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F.
  - B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F.
  - C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

#### 1.8 EXTRA MATERIALS

***NOTE: VERIFY WITH MA AND CM IF EXTRA MATERIALS REQUIRED.***

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.
1. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. of each material and color applied. Mark each container with color identification and room names or numbers where paint was used without obscuring manufacturer's label.

## **PART 2 - PRODUCTS**

### 2.1 MANUFACTURERS

- A. Products: All paints and coatings installed in the building interior meets the testing and product requirements of the California Department of Health Services *Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers*, including 2004 Addenda.
- B. Manufacturers Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
  - 1. ICI Dulux/Devoe Coatings (ICI – Dulux)
  - 2. Benjamin Moore and Co. (B. Moore)
  - 3. PPG Industries, Pittsburgh Paints (PPG)
  - 4. The Sherwin-Williams Company (S-W)

### 2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- B. Colors: Provide color selections made by the Architect.
- C. Paint System: The paint systems specified are intended to comply with the VOC and chemical component limits of green seal standard GS-11 (interior non-clear systems). Where the plant producer produces product that improve upon those of the specified product, provide the improved product. It is the intent that all components of the systems individually (primer/sealer, under coat, top coat) comply. Provide products that comply to the extent available or prepare a budget that will ensure compliance on a project wide basis. Anti-corrosive components may have a VOC limit of 250 G/L.

### 2.3 EXTERIOR PAINT SCHEDULE

#### ***NOTE: EDIT PAINT SYSTEMS CAREFULLY***

- A. Stucco (Cement Plaster) (and CMU)
  - 1. Primer: Dry film thickness of not less than 1.5 mils (0.038 mm). (Apply to unprimed surfaces).

B. Moore:	Moorcraft Super Spec Latex Exterior Primer #169
ICI Dulux:	#3030 Ultra-Hide Bond Prep. Waterborn Masonry Primer.
PPG:	Speedhide Acylic Alkalii Resistant Primer, 6-603.



S-W: Loxon conditioning guide coat white A29W100.

2. First and Second Coats: Two (2) full and separate coats, dry film thickness of not less than 2.4 mils (0.061 mm).

B. Moore: Moorcraft Super Spec Flat Latex House Paint #171  
ICI Dulux: #2210 Ultra-Hide Durus 100% Acrylic Flat  
PPG: Speedhide Exterior Flat Latex, 6-610 Series.  
S-W: 100% Acrylic B12WF series.

B. Wood

1. Primer: Dry film thickness of not less than 1.5 mils (0.038 mm).

B. Moore: Moorcraft Super Spec Latex Exterior Primer #169  
ICI Dulux: #2010 Ultra Hide Durus 100% Acrylic Prime Coat.  
PPG: Speedhide Exterior Acrylic Latex Primer, 6-609.  
S-W: A-100 Latex Wood B42.

2. First and Second Coats: Two (2) full and separate coats, dry film thickness of not less than 2.2 mils (0.056 mm).

B. Moore: Moorcraft Super Spec Flat Latex House Paint #171  
ICI Dulux: #2210 Ultra Hide Durus 100% Flat.  
PPG: Speedhide Exterior Flat Latex, 6-610 Series.  
S-W: A-100 Acrylic B12WF series.

C. All (Other) Ferrous Metal:

1. Galvanized: Condition and prime if necessary in accordance with recommendations of print system manufacturer.
2. Primer (Unpainted Surfaces): Remove rust and contaminants with mineral spirits, sanding and wire brushing to bare metal, dry film thickness of not less than 1.3 mils (0.033 mm).

B. Moore: IMC DTM Acrylic Semi-Gloss M29  
ICI Dulux: #4020 Devlex DTM Waterborn Primer.  
PPG: Pitt-Tech Primer 90-715  
S-W: Pro-Cryl Universal Metal Primer B66-310 series.

3. First and Second Coats: Two (2) full and separate coats, dry film thickness of not less than 2.6 mils (0.066 mm)

B. Moore: IMC DTM Acrylic Semi-Gloss M29  
ICI Dulux: #2416 Ultra Hide Durus Exterior Semi Gloss Finish.  
PPG: Pitt-Tech Int/Ext Satin DTM Industrial Enamel, 90-474 series.  
S-W: Semi-Gloss Coating B66W200 Series.

## 2.4 INTERIOR PAINT SCHEDULE

### ***NOTE: EDIT PAINT SYSTEMS CAREFULLY***

#### A. Concrete Masonry Units:

1. Block Filler (Unfinished Surfaces): Dry film thickness of not less than 5.0 mils (0.13 mm).

B. Moore: Moorcraft Super Craft Latex Block Filler #285  
ICI Dulux: #4000 Broxfil Heavy Duty Acrylic Block Filler  
PPG: 6-7 Speedhide Latex Block Filler  
S-W: PrepRite Latex Block Filler B25W25.

2. First and Second Coats: Two (2) full and separate coats, dry film thickness of not less than 2.5 mils (0.064).

B. Moore: Pristine Eco Spec Interior Latex Eggshell Enamel #223  
ICI Dulux: #LM9100 Lifemaster 2000 Flat.  
PPG: Pure Performance Interior Low Odor Zero VOC Premium Eggshell Latex 9-411 series.  
S-W: Harmony Interior Latex Eg-Shel B9W900 series.

1.

#### B. Concrete Masonry Units (where scheduled Epoxy)

1. Blockfiller: 100% acrylic blockfiller, dry mil thickness of not less than 10.0 mils (50-90 sq.ft./gal Min., Volume Solids: 53% absolutely necessary to utilize Epoxy, the AOR must develop "VOC budget" as provided by LEED to demonstrate that the credit can be obtained.

Moore: IMC Waterborne Epoxy Block Filler M31/M32  
S-W: Heavy Duty Blockfiller B42W46  
PPG: Speedhide Int/Ext Blockfiller 6-15  
ICI Dulux: Int/Ext Blockfiller 3010.

2. First and Second Coats: Two (2) full and separate coats, dry film thickness not less than 2.5 mils per coat: 2-component waterbased catalyzed epoxy, Min. Volume Solids: 38% (catalyzed), Sheen: 20-30 units @ 60 degrees.

B. Moore: IMC Acrylic Epoxy Gloss Coating M43/M44  
S-W: Water Based Catalyzed Epoxy B70 series/B60V25  
PPG: Pitt-Glaze Acrylic Epoxy S/G 16-551/16-599 Series  
ICI Dulux: TruGlaze WB Waterborne Epoxy Semi-gloss 4406

#### C. Stained Woodwork:

1. Alkyd-Based, Satin-Varnish Finish: 2 finish coats of an alkyd-based, clear-satin varnish over a sealer coat and an alkyd-based, interior wood stain. Wipe wood filler before applying stain.

- a. Stain Coat: Alkyd-based, interior wood stain as required to match architect's sample.

B. Moore: #1700 Woodpride Int. Solventborne Wood finishing Stain  
ICI Dulux Benwood Penetrating Stain #234.  
PPG: 77-560Rez Interior Semi-Transparent Stain.  
S-W: Wood Classics Oil Stain A-49 Series.

- b. First and Second Finish Coats: Alkyd-based or polyurethane varnish, as recommended by the manufacturer, applied at spreading rate recommended by the manufacturer.

B. Moore: Benwood Stays Clear Acrylic Polyurethane High Gloss #422.  
ICI Dulux #1808 Waterborne Aquaacrylic Gloss Varnish  
PPG: 77-49 Rez Satin Acrylic Polyurethane.  
S-W: Wood Classic Satin Varnish A68F90.

- D. Ferrous Metal (where scheduled Satin, Low-Luster Eggshell):

1. Primer: Dry film thickness of not less than 1.5 mils (0.038 mm).

B. Moore: M04 Acrylic Metal Primer  
ICI DuLux: #4020 Devflex DTM Waterborne Primer Finish.  
PPG: Pitt-Tech Primer 90-715.  
S-W: Pro-Cryl Universal Metal Primer B66-310 series.

2. First and Second Coats: Two (2) full and separate coats, dry film thickness of not less than 2.8 mils (0.071 mm).

B. Moore: Pristine Eco Spec Interior Latex Eggshell Enamel #223  
ICI Dulux: #LM9300 Lifemaster 2000 Eggshell Finish.  
PPG: Pure Performance Interior Low Odor Zero VOC Premium Eggshell Latex 9-411 series.  
S-W: ProClassic Water Borne B31 Series

- E. Ferrous Metal (where scheduled Semi-Gloss):

1. Primer: Dry film thickness of not less than 1.5 mils (0.038 mm).

B. Moore: M04 Acrylic Metal Primer.  
ICI Dulux: #4020 Devflex DTM Waterborne Primer/Finishrimer.  
PPG: Pitt-Tech Primer 90-715.  
S-W: Pro-Cry Universal Metal Primer B66-310 series.

2. First and Second Coat: Two (2) full and separate coats dry film thickness of not less than 1.3 mils (0.033 mm).

B. Moore: Pristine Eco Spec Interior Latex Semi-Gloss Enamel #224  
ICI Dulux: #LM9200 Lifemaster 2000 Semi Gloss.  
PPG: Pure Performance Interior Low Odor Zero VOC Premium  
Semi-Gloss Latex 9-411 series.  
S-W: ProClassic Waterborne Acrylic Semi-Gloss B31 Series.

- F. Overhead Exposed Construction (Deck, Joists, Steel)
1. One (1) coat flat dry fallout coating system to cover formulated for compatibility with all substrates by any paint manufacturer specified herein. Use 100% Acrylic, flash-rust-resistance dryfall.

B. Moore: Sweep-Up Spray Latex Flat M53  
ICI Dulux: #1280 Spraymaster Pro-Uni-Grip – WB Aquacrylic Dryfall  
Flat (or non-flat if required to meet VOC limits).  
S-W: Waterborne Acrylic Dryfall B42W2-Eg-Shel  
PPG: Speedhide Flat 6-713 Series Dryfall (or non-flat if required  
to meet VOC limits)

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
  2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

#### **3.2 PREPARATION**

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
    - a. Use low dust emission wet methods to prepare the surface as recommended by the paint manufacturer.
    - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
    - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
  - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when using low dust emission, wet method and when dried.
  - 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent environmentally friendly or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
    - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer and spot prime with rust-inhibitive metal primer recommended by the topcoat manufacturer. Primer coats should be applied without delay, before rust reappears, with rust inhibitive primer.
  - 5. Galvanized Surfaces: Clean per SSPC-SP1 with non-hydrocarbon solvent such as Simple Green.

Weathered, unpainted galvanized metal surfaces must be wire brushed or power washed to remove deposits of "white rust," then primed with an acrylic latex metal primer. Rusted areas must be sanded clean, and spot primed with an acrylic latex metal primer, then coated overall with same.

Peeling and scaling paint and chalk must be removed by scraping, sanding and wirebrushing. Rusted and abraded surfaces must be cleaned by scraping, sanding, and wirebrushing, then primed, without delay, with an acrylic latex metal primer.
- D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
  - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
  1. Paint colors, surface treatments, and finishes are indicated in the schedules.
  2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  3. Provide finish coats that are compatible with primers used.
  4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
  5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  9. Sand lightly using low-dust emission wet methods between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
  2. Omit primer on metal surfaces that have been shop primed and touchup painted.
  3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  4. Allow sufficient time between successive coats to permit proper drying as per manufacturer's recommendations.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
  1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as defined in these specifications and as recommended by the manufacturer (whichever is greater).
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and in occupied spaces.
- F. Mechanical items to be painted include, but are not limited to, the following:
  1. Piping, pipe hangers, and supports.
  2. Heat exchangers.
  3. Tanks.
  4. Ductwork.
  5. Insulation.
  6. Motors and mechanical equipment.
  7. Accessory items.
- G. Electrical items to be painted include, but are not limited to, the following:
  1. Conduit and fittings.
  2. Switchgear.
  3. Panelboards.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### 3.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
2. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specified requirements. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

### 3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site in accordance with the Waste Management plan.
  1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.
- B. The testing agency will perform on site and laboratory tests for the following characteristics as required by the board:
  1. ASTM D3359 and D6677 Adhesion Tests.
  2. Film thickness tests.
  3. Quantitative materials analysis.
  4. Apparent reflectivity.
  5. Washability.
  6. Dry Capacity.

### 3.6 PROTECTION

- A. Confine dust and odor emissions by using low-dust wet methods. If this is insufficient, the contractor must use barriers, containment and HEPA filtered negative air equipment to limit migration of dust and odors beyond the work areas.
- B. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
  1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

END OF SECTION



**SECTION 10101**  
**VISUAL DISPLAY UNITS**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section includes:
  - 1. Marker Boards.

1.2 SUBMITTALS

- A. Product Data: Submit complete printed data and installation details indicating products to be provided as specified.
  - 1. Submit color charts for selections by the Architect.
- B. Shop Drawings: Submit complete installation details. Include dimensioned elevations. Show location of joints between individual panels where unit dimensions exceed maximum panel length.
- C. Samples: Submit minimum one-foot square fabricated unit of each type required, complete with factory-applied trim, chalk rail and head rail with accessories as specified for each type of unit demonstrating fabrication.

1.3 PROJECT CONDITIONS

- A. Field Measurements: Verify field measurements before preparation of Shop Drawings and before fabrication to ensure proper fitting where required. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.4 WARRANTY

- A. Porcelain Enamel Chalkboard Warranty: Submit a written warranty executed by manufacturer agreeing to replace porcelain enamel chalkboards that do not retain their original writing and erasing qualities, become slick and shiny, or exhibit crazing, cracking, or flaking within the specified warranty period, provided the manufacturer's written instructions for handling, installation, protection, and maintenance have been followed.
  - 1. Warranty Period: 50 years from date of Preliminary Acceptance.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements and availability, provide products by one of the following:
1. AARCO
  2. A-1
  3. Best-Rite
  4. Claridge
  5. Ghent
  6. General Binding
  7. Marsh
  8. ProSteel
  9. polyvision

## 2.2 MATERIALS

- A. Porcelain Enamel Markerboards: High-pressure-laminated porcelain enamel chalkboards/markerboards of 3-ply construction consisting of face sheet, core material and backing.  
Face Sheet: 28 gauge enameling grade steel especially processed for temperatures used in coating porcelain on steel. Coat exposed face with a 3 coat process consisting of .0025 cobalt primer, .003 ground coat, and color coat. Coat concealed face with a 2 coat process consisting of primer and ground coat. Fuse cover and ground coats to steel at manufacturers standard firing temperatures, but not less than 1200 deg. F (chalkboard) and 1500 deg. F (markerboard).
- a. Marker Board Cover Coat: Provide manufacturer's standard, light-colored, special writing surface with gloss finish intended for use with erasable dry markers.
  - b. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.
  - c. Provide manufacturer's standard vertical joint system between abutting sections of chalkboards.
  - d. Provide manufacturer's standard mullion trim at joints between chalkboards and tackboards.
  - e. Laminating Adhesive: Manufacturer's standard, moisture-resistant, thermoplastic-type adhesive complying with LEED credit 4.1 for VOC content.
- B. Vinyl-Fabric-Faced Tackboards: Mildew-resistant, washable vinyl fabric complying with FS CCC-W-408, Type II, weighing not less than 13 oz./sq. yd. (440 g/sq. m), laminated to 1/4-inch- (6.4-mm-) thick cork sheet. Provide fabric with a flame-spread rating of 25 or less when tested according to ASTM E 84. Provide color and texture as scheduled or as selected from manufacturer's standards.
1. Backing: Factory laminate cork face sheet under pressure to 1/4-inch- (6.4-mm-) thick hardboard backing.

## 2.3 ACCESSORIES

1.
  - a. Flag Holder: Provide one flag holder for each room.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces, with Installer present, for compliance with requirements and other conditions affecting installation of visual display boards.
  - 1. Surfaces to receive markerboards shall be free of dirt, scaling paint, and projections or depressions that would affect smooth, finished surfaces of markerboards.
  - 2. Surfaces to receive tackboards shall be dry and free of substances that would impair the bond between tackboards and substrate.
  - 3. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Deliver factory-built units completely assembled in one piece without joints, where possible. If dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain surface alignment.
- B. Install units in locations and at mounting heights indicated tight to surface, secure, and according to manufacturer's written instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

### 3.3 ADJUSTING AND CLEANING

- A. Verify that accessories required for each unit have been properly installed and that operating units function properly.
- B. Clean units according to manufacturer's written instructions.

END OF SECTION

## SECTION 11400

### FOOD SERVICE EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. The plans and specifications as written are inclusive of known quantities, and quality standards that meet the minimum performance standards of the school lunch program for the city of Chicago public schools, the architectural limitations of the new building and the enrollment capacity of the new school.
- B. All equipment shall be provided in strict accordance with the plans and specifications. All contractors, subcontractors, and sub-tier subcontractors shall be bound to the specifications as well as the general contract conditions, supplemental conditions and section one of the contract documents.
- C. The naming of manufacturers in the specifications or on the drawings shall not be construed as an intention to eliminate the products of other manufacturers having equivalent products that meet or exceed the performance and quality standards of the named manufacturer.
- D. Other manufacturer's products will be considered subject to meeting the performance criteria specified herein.
- E. Any necessary modifications of the equipment, building, piping, ductwork, electrical or any other work including architectural costs resulting from the use of substituted equipment or material shall be at the sole costs of the contractor and specifically not the building owner.
- F. The approval of substituted material or equipment by owner or the architect will not relieve the contractor from sole responsibility for the proper installation and original performance requirements nor will the approval and or review by the owner or architect be considered as a basis for any additional monies or an extension of time in the performance of the contract work.

##### 1.2 DESCRIPTION

- A. Furnish and install all food service equipment indicated on the drawings and as specified herein. The work includes but is not necessarily limited to the following:
  - 1. Custom fabricated equipment.
  - 2. Prefabricated equipment.
    - a. Where more than one manufacturers name is listed you may select one of the named manufacturers as long as all options and accessories are included to meet the performance criteria.
  - 3. Necessary appurtenances and accessories.
- B. It is the intention of these specifications to designate an inclusive job, complete, ready for use, except plumbing rough-in, electrical rough-in, (all ductwork and fans up stream from the hood collars) and final connections which will be made by other contractors as noted equipment shall be set in place, leveled, ready for use except for the final connections by the respective building trades.

### 1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. The following sections contain requirements that relate to this section.
1. Division 15
    - a. Waste, water and vent piping rough in for and make all final connections to all equipment.
    - b. Pressure reducing valves, "P" traps, floor drains and grease traps.
    - c. All indirect connected waste lines and condensate drainlines.
  2. Division 16
    - a. All wiring, conduit and fittings shown on the electrical drawings and final connection to the equipment.
    - b. Receptacles for all equipment furnished with cords and plugs.
    - c. Any miscellaneous disconnects, transformers, switches and other related equipment, which are required for a complete operating assembly.

### 1.4 QUALITY ASSURANCE

- A. General Provisions
1. The Food Service Equipment Contractor will be referred to in the specifications and on the drawings as the "K.E.C." or the Kitchen Equipment Contractor, or the Food Service Equipment Contractor.
  2. Kitchen Equipment Contractor shall carefully read all the Contract Documents and furnish the equipment to conform to the construction limitations of the building as set forth in all of the Contract Documents.
- B. Uniformity of Construction
1. All custom-fabricated equipment shall be made by one manufacturer and shall be uniform throughout as to method and type of construction used. All equipment shall carry a nameplate identifying the manufacturer.
- C. Contractor Qualifications
1. The Food Service Equipment Contractor shall have been regularly engaged in this work for the past five years, and use only skilled craftsmen completely familiar with the methods and materials called for herein.
  2. The Contractor, upon demand, shall submit to Architect written evidence of having executed contracts of a comparable size and evidence of sufficient financial resources, which will enable him to perform the work in an expeditious manner, without delay to the project or to other trades.
  3. Fabrication of items other than standard catalog items shall be fabricated by a food service equipment fabricator, which has the plant, personnel, and engineering facilities to properly design, detail, and fabricate high quality equipment. The fabricator shall be acceptable to the Architect and the Owner. Furthermore, all work in above category shall be standard unit assembly manufactured by one manufacturer and of uniform design, material, and finish equal to the specification as written.
- D. Deviations of Specifications and Substitutions
1. The Contractor shall furnish equipment in strict accordance with the Specifications.
  2. Any and all substitutes shall be in strict accordance with the conditions and procedures of the section one contract documents. Any requests not meeting the qualification and procedures as written will be cause for rejection by the Owner and or the Architect.
- E. Standard Manufactured Equipment
1. All standard catalog items shall be furnished as specified in regard to brand name, item type, accessories, scheduled options and quantities.

2. All equipment shall be new and of the latest current model.
3. All equipment shall be delivered to the job site in the manufacturer's original shipping container or packaging, sealed and unopened.
4. All equipment shall be N.S.F. labeled.

F. Codes, Regulations and Standards

1. All equipment shall be constructed in strict conformance with the standards of the National Sanitation Foundation as outlined in its bulletin on food service equipment entitled "Standard No. 2" dated July and October, 1952 with its most current revision. Each piece of equipment shall have a "seal of approval" label of the National Sanitation Foundation.
2. Installation of all food service equipment shall comply fully with Illinois State Department of Public Health Regulations and with other current applicable City, County, State and Federal regulations and code requirements.
3. The Contractor shall submit all notices required by law to authorities having jurisdiction and shall obtain and pay for all required permits or certificates of inspection. Submit to the Owner permits and certificates of inspection prior to the request for final payment.
4. All refrigeration shall meet the requirements of the City of Chicago Refrigeration Department and meet or exceed the requirements of the 1995 Montreal Convention.

G. Field Dimensions

1. The K.E.C. shall take all field dimensions as required to fit its equipment to the building conditions and shall coordinate with the other building trades in locating the utility service connections.
2. Trim will not be acceptable to fit the equipment to the building where the K.E.C. has failed to verify all field dimensions.

1.5 SUBMITTALS

A. Shop Drawings

1. Submit shop drawings in compliance with section one documents.

B. Equipment Data

1. Submit catalog sheets of standard manufactured equipment in compliance with section one documents.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials and equipment shall be delivered and handled on the job site in a manner to prevent damage or loss, and stored in a place protected from damage, moisture and exposure to elements.
- B. In the event of damage, immediately make all repairs and replacements necessary to meet the approval of the Architect and at no additional cost to the owner.
- C. No equipment shall be delivered to the job site until the site is ready to receive the equipment.

1.7 JOB CONDITIONS

- A. Coordinate work with the work of other contractors to insure proper roughing-in and final connections to equipment and that adequate openings and bases for equipment are provided.

- B. Establish the exact size of openings to be left for all built-in work, and verify all measurements at the job site and be responsible for same.
- C. Kitchen Equipment Contractor shall provide a representative at the job site during the installation of his equipment, who shall supervise the installation of the equipment and coordinate the connection of the equipment.
- D. Protect all surfaces and structure in the area of installation from damage during the execution of work.
- E. Schedule delivery of food service equipment so that areas to receive it are ready for installation.
- F. Final tests of all equipment and demonstration of use shall be made in compliance with section one documents.

#### 1.8 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Furnish complete portfolios in compliance with section one documents.

#### 1.9 GUARANTEE

- A. The contractor is required to place all equipment in perfect operating order inclusive of each particular system or parts thereof, which are part of his work, ready for continuous use and satisfactory operation, in a manner acceptable to the Architect and Owner.
- B. The contractor shall guarantee all furnished work and materials and equipment are in compliance with section one documents.
- C. This guarantee shall not be constitute to abrogate other specified guarantees or usual guarantees against work that has been defective when supplied or that has been improperly cared for or protected during the construction period.
- D. In addition to the normal testing and repair, which are required for the completion of his work during the guarantee period, the Contractor shall visit the building at the Owner's request to clarify any questions for the operating personnel concerning the proper operation and maintenance of the equipment.
- E. All compressors furnished as part of the food service equipment shall have a five (5) year warranty commencing from date as stipulated above. This warranty shall be as provided by the manufacturer of the compressor.
- F. Provide extended warranties where specified.

### **PART 2 - PRODUCTS**

#### 2.1 QUALITY AND CONDITION OF MATERIALS

- A. All materials shall be new, first quality, and without flaws. Equipment shall be delivered upon completion in an undamaged condition. The K.E.C. shall protect from damage, clean, and put into operating condition before acceptance by Owner.

## 2.2 MATERIALS AND GAUGES

- A. Unless otherwise specified or shown on drawings, all surfaces shall be fabricated of stainless steel, including exposed underbracing below tops of dish tables and open base tables and sinks. The gauges used shall be as follows:
1. 12 ga. (Special construction where specified) Wide tops, sinks, underbracing, drip pans and floor troughs.
  2. 14 ga. (Standard construction unless otherwise noted) Table tops, sinks, underbracing and special overshelves.
  3. 16 ga. (Standard construction, unless otherwise noted) Undershelves, interior shelves, overshelves, wall shelves, body panels for base cabinets and counters.
  4. 18 ga. (Standard construction, unless otherwise noted) Body panels for wall cabinets, partitions, back wall panels, drawer and door fronts and canopies.
  5. 20 ga. (Standard construction, unless otherwise noted) Liners for refrigerators, interior panels for drawers and doors.

## 2.3 MATERIALS

- A. Non-Corroding Alloy
1. Non-corroding alloy, or stainless steel, specified hereinafter shall be Type 304 stainless steel, having a standard analysis of 18% chromium and 8% nickel. Sheets shall be stretcher leveled, free of buckles, warps and surface imperfections.
  2. All gauges, where specified United States Standard gauges. All exposed surfaces shall be given a finish equal to #4 or 180 grit. Where manufacturing process and welding disturb the original finish, it shall be carefully reground, polished and restored to match balance of surface.
- B. Galvanized Iron: Where galvanized iron is specified, furnish hot-dip galvanized, copper bearing steel. Use in largest possible sheets with as few joints as necessary. All sheets shall be commercial quality, stretcher leveled, and re-rolled to insure a smooth surface.
- C. Faucets, Valves, Fittings: Sinks fitted with faucets as called for under each or as a separate item listed as faucets. All basin type faucets, Chicago #51, T&S #B202, or Fisher #3110. All splash mount faucets, Chicago #445, T&S #B237, or Fisher #3210. All special faucets for kettles, pre-wash, etc., shall be listed under Item Specifications.
- D. Motors: Up to and including 1/2 HP shall be wired for 120 volts, single phase. Motors over 1/2 HP shall be wired for 208 volts, coordinate with electrical contractor.
- E. Switches and Controls: The equipment contractor shall supply each motor-driven appliance or electrically heated unit a suitable control switch or starter of proper type in accordance with Underwriter's Laboratories and code requirements. Controls that are mounted on vertical surfaces of fabricated fixtures shall be set into recessed die stamped stainless steel cups or otherwise indented to prevent damage.
- F. Electrical Elements:
1. Fabricated items requiring dry heat, such as plate warmers, urn stands shall be fitted with strip or ring heaters of sufficient wattage to provide specified heat. Unless otherwise specified, these heaters shall be installed directly below bottom shelf. Mount in suitable channels and interconnect with hard copper wire in accordance with Electrical Code. Provide each fixture with one or more thermostatic controls, each with pilot light indicator(s).



2. Properly protect all wiring in metal enclosures in accordance with the National Electrical Code, the Chicago Electrical Code and UL Standards.

## 2.4 FABRICATION

### A. Open Type Bases

1. Pipe standards and frames: All pipe stands for open base tables or dish tables shall be constructed of 1-5/8 OD stainless steel tubing, with stringers and cross braces of the same material. All joints between legs and cross braces shall be welded and ground smooth. Legs shall not be spaced more than 5'6" on center.
2. Feet: Fit all pipe legs with sanitary, die-stamped stainless steel bullet shaped feet, fully enclosed, with a slightly rounded bottom to protect the floor. Fit top of these feet with a male threaded stem to fit into the end of the pipe legs specified and provide a total adjustment of 1". Stem shall be extra long so threads are not exposed. Finish off bottom on pipe leg smoothly and overlap stem to provide sanitary fitting and prevent accumulation of grease or other debris at this joint.
3. Undershelves: Unless otherwise specified in item Specifications, undershelves shall be constructed of 16 gauge stainless, turned down front, sides and back 1-1/2" with edges deburred. Shelf shall have rounded corners and be provided with die-stamped raised ferrules to receive legs. Reinforce shelf with 14 gauge stainless steel closed inverted hat type channels. Dish table shelves shall be removable.

### B. Enclosed and Semi-Enclosed Bases:

1. Body: Body shall be constructed of fronts, and ends and backs of 18 gauge stainless steel formed and reinforced to create a rigid, welded structure.
2. Tops: When metal tops are specified, reinforced with 14 gauge stainless steel closed inverted hat-type channel bracing.
3. Shelves: intermediate shelves shall be welded in place, unless otherwise specified. Bottom shelves shall be made removable in sections. Both types of shelves shall be constructed of 16 gauge stainless steel turned down fronts, sides and back 1-1/2" with deburred edges. Shelves shall be braced with 12 gauge stainless steel closed inverted hat-type channels. Provide pipe chase openings for utility lines when required. Intermediate shelves shall be turned up 1-1/2" in back and sides and feathered along wall surfaces of base.
4. Legs: Unless otherwise specified, or detailed, bases shall be mounted on 6" high, 1-5/8" OD stainless steel seamless tubular legs, each fitted with a stainless steel closed bottom, vermin-proof, adjustable bullet shaped foot. Legs shall be welded to 14 gauge stainless steel closed inverted hat-type channel welded to body under lower shelf.
5. Drawers: Drawers, unless otherwise specified, shall be 20" x 20" x 5" deep. Drawer front shall be pan-type, fabricated of 14 gauge stainless steel, fitted with a S.S. recessed pull and shall be flush with enclosure. Drawer insert shall be fabricated of 28 gauge stainless steel with all interior coved 1/2" radius. Insert shall be removable and shall be at least three-quarter exposed when drawer is opened fully. Drawer shall operate on heavy-duty stainless steel extension slides with stainless steel ball-bearing rollers. Drawer shall be enclosed fully and shall be self-closing except when fully extended. Provide stainless steel hasp fully welded to all drawers.

### C. Table Tops (Metal):

1. Metal table tops of 14 gauge stainless steel with all horizontal and vertical corners coved on 5/8" radius. Shop seams and corners welded, ground smooth and polished. Working tops enclosed base fixtures reinforced on the underside with a framework of 1-1/2" x 4" x 1-1/2" inverted closed hat channel. Cross angle members placed at each pair of legs.

- Additional cross angle members between legs on not less than 48" centers. One angle runner, running lengthwise, provided on top so here will not be any noticeable deflection. Studweld reinforcements to underside of top. Do not use rivets or bolts through top.
2. Provide field joints in top where necessary and locate for practical construction, consistent with sizes convenient for shipping and accessibility into building. See paragraph entitled "Field Joints" for description of these joints.
  3. Turn metal tops down 1-3/4" in a bullnose roll except where adjacent to walls or other pieces of equipment. Turn wall side up and back 2" unless otherwise specified in schedule.
- D. Dish Table Tops:
1. Construct tops of dish tables of 14 gauge stainless steel with all free edges turned up 3" and finished with die-formed sanitary rolled rim. Flange sides adjacent to walls or higher fixtures up 6" and back 2" at up 45 degrees then down 3/4". All interior horizontal and vertical corners shall be coved on 5/8" radius. Outside radius of rolled rim corners shall be concentric with side cove.
  2. Mount dish table tops on stainless steel tubing legs and connecting rails same as specified for open base tables.
  3. Ends of splash shall be closed. Free corners of tops shall be spherical.
- E. Sinks, Drainboards and Sink Insets:
1. Unless otherwise specified in Item Specifications shall be fabricated of 14 gauge stainless steel with 1-1/2" rim of front and sides and shall be of one-piece welded construction. All interior corners shall be coved a minimum of 3/4" radius, horizontally and vertically, with all intersections meeting in a spherical section. Solder filling shall not be acceptable. All exposed corners shall be bullnosed. Unless otherwise specified, backsplash shall be turned up 8", back on a 45 degree angle and down 3/4" with exposed ends closed. Bottom shall be pitched and fitted with 1-1/2" waste outlet with stainless steel removable strainer plate, lever handle valve and connected overflow. The use of die drawn bowls will not be accepted.
  2. Multiple Compartments: All sinks having two or more compartments adjacent shall be of double thickness continuously welded to form a continuous front. Each compartment shall be pitched and fitted with a 1-1/2" I.P.S. waste outlet with stainless steel removable strainer plate, lever handle valve and connected overflow.
  3. Drainboards: Where drainboards with sink compartments are specified they shall be fabricated of the same material as sink and shall be welded integrally with sink to form one-piece welded construction. Drainboards shall be pitched 1/8" per foot minimum. However, drainboards rim shall be kept level with sink. The front end shall be turned up 3" and finished with a 1-1/2" channel rim, with edges deburred. All exposed corners shall be rounded. Unless otherwise specified, backsplash shall be turned up 8", back on a 45 degree angle and down 3/4" with all exposed ends closed. Drainboards shall be reinforced with a 14 gauge stainless steel closed inverted hat-type channel bracing. Undersides of sinks and drainboards shall be coated with 1/8" thick hard-drying, sound-deadening mastic material and sprayed with aluminum paint.
  4. Sink Insets: Sinks built into tops of fixtures, unless otherwise specified in Item Specifications, shall be fabricated of 14 gauge stainless steel. All interior corners shall be coved a minimum of 3/4" radius, horizontally and vertically with all intersections meeting in a spherical section. Sinks shall be welded integral to table tops. Riveted, spot-welded, and soldered joints between sink and top of table or in sink proper shall not be acceptable. Bottom shall be pitched and fitted with 1-1/2" I.P.S. waste outlet with stainless steel crumb strainer waste outlet. All sizes of sinks specified are inside dimensions.

- F. Field Joints:
  - 1. All field joints shall be welded.
  - 2. All welded parts shall be non-porous and free of imperfections, free of pits, cracks, or discoloration. All welds of galvanized metal on dish tables and sinks shall be ground smooth, sandblasted, and sprayed with molten zinc at 1,200 degrees F to a minimum thickness of .004". Tinning of welds shall not be acceptable. All welds of stainless steel shall be ground and polished to original finish.
- G. Sound Deadening:
  - 1. Underside of all tops at contact of body and bracing shall be sound deadened with high quality asphalt mastic: Philip Cary "Hush Mush", Daubert Chemical "Quiet Tape", or approved equal.
  - 2. Underside of drawers and shall be sound deadened.
  - 3. Double walled sliding and swing doors shall be fitted with sound deadening insulation between the walls.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. Furnish to the architect a purchase order log with the following information.
  - 1. Line item equipment number
  - 2. Quantity of each line item
  - 3. Manufacturer name
  - 4. Model number of line item
  - 5. Date ordered
  - 6. Scheduled delivery date
  - 7. Purchase order number
- B. Furnish the general contractor with the following items.
  - 1. A delivery schedule compatible with their construction schedule.
  - 2. All items of equipment that would require early installation dates, i.e. hoods, floor troughs, etc.
  - 3. Copies of all delivery receipts and bill of ladings for all items delivered to the job site. Copy shall bare the written name and signature of receiving person.
  - 4. All loose, small component items shall be clearly taped with the corresponding item number.
  - 5. The general contractor shall distribute all components that are scheduled for installation by others to each respective trade.
- C. Trash and crating
  - 1. Remove all debris generated by k.e.c. to job site dumpsters on a daily basis.
  - 2. Do not allow any debris to accumulate in any work area that would impede the work of others or would in any way create a hazard.

#### **3.2 SITE INSPECTIONS**

- A. Report to the general contractor in writing verification of all rough locations that are not located per the drawing or the requirements of the specified equipment.
- B. Field verify actual as built dimensions of all walls, rough-ins, structurals, etc. That effect your work.
- C. Field verify that all areas are ready to receive equipment prior to delivery to site.

### 3.3 INSTALLATION

- A. Deliver all equipment in strict accordance with the specifications.
- B. Deliver, uncrate, assemble, set in place, and level all equipment to be ready for final m.e.p. connections.
- C. Cover all equipment work surfaces with, a thickness equal to the original packaging material, a cover to protect the equipment until the job site is ready for final clean up. All covers shall be securely fastened to the equipment.
- D. Silicone seal all equipment to walls where equipment abuts walls. Seal shall be neat, clean and coved so as to create an easily cleanable surface.
- E. Securely fasten with concealed fastener all scheduled trim after all final connections are completed.
- F. Field verify that all exposed edges of all equipment is free of all burrs, sharp edges and all exposed surfaces are free of any and all fabrication irregularities. Where necessary repair, grind and polish irregularities to a quality finish consistent with the specification standards.
- G. Remove all protective covering from all equipment and clean all equipment ready for final sanitizing when the job site is ready for final inspection by the architect.

### 3.4 TESTING

- A. Verify that all equipment is connected as per the manufacturer requirements.
- B. Lubricate, start-up, test and adjust all equipment prior to the architect's and owner's inspection.
- C. Notify the architect in writing that all equipment is ready for inspection and demonstration.

### 3.5 CONTRACT CLOSE OUT

- A. Deliver to the architect all required copies of owner's manuals, operating instructions and warranty documents prior to scheduling architect acceptance review.
- B. Demonstrate all items of equipment to architect and owner.
- C. Deliver all keys clearly tagged, miscellaneous loose accessories to the owner via schedules bill of lading and secure signature for same.

## **PART 4 - LINE ITEM SPECIFICATION**

KEC contractor shall install all equipment level and plumb. All necessary field modifications to equipment to achieve a level and plumb installation shall comply with all applicable codes and (NSF) sanitation requirements.

**ITEM 1        STOREROOM SHELVING**

Quantity and size as shown on the drawings.

CAMBRO MFG. CO. 7601 CLAY AVE. HUNTINGTON BEACH, CALIFORNIA 92648-2219 800-854-7631 FAX 714-842-3430 MODEL: CAMSHELVING	INTERMETRO INDUSTRIES CORP. NORTH WASHINGTON ST. WILKES-BARRE, PENNSYLVANIA 18705 717-825-2741 FAX 717-825-2852 MODEL: METROMAX	AMCO INDUSTRIES 901 N. KILPATRICK AVE CHICAGO, IL 60651 800-621-4023 FAX 312-379-5183 MODEL: PLASTIC PLUS
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Steel core posts and traverse supports polypropylene coated. Open grid, removable shelf mats capable of being washed in a commercial dishwasher. A 48" shelf section shall support 800 lbs. Each unit to be sized per plan and adjusted per field conditions and to be approximately 84" – 87" high and to have three (3) tiers equally spaced. Each section to be fitted with 5" high premium swivel casters with brakes suitable for corrosion resistant applications.

**NOTE: ALL SHELVING FOR ITEMS 1 - 3 SHALL BE BY THE SAME MANUFACTURER**

**ITEM 2        KOLD LOCKER (F)**

Quantity and size as shown on drawings.

KOLPAK/McCALL 641 N. McCORKLE PARK PARSONS, TN 38363 901-847-5306 901-847-9013 (FAX) Model #P6-0610-FT	LEER MANUFACTURING 206 LEER STREET NEW LISBON, WI 53950 888-766-5337 608-562-3166 (FAX) Model #G5-6X10	NOR-LAKE 727 SECOND ST. HUDSON, WI 54016 800-955-5253 715-386-6149 (FAX) MODEL #KL-610
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Cooler shall be exterior sized per the drawing for nominal 6'-0" x 10'-0" width and length, and shall be 6'-6" high. Failure of the Kitchen Equipment Contractor to provide the correct size, as specified that results in changes to the building architectural and mechanical electrical and plumbing system shall pay all costs to alter same.

Walls panels, interior and exterior shall be a minimum 26 gauge, pebble pattern finish aluminum, with 4" thick closed-cell foamed-in-place polyurethane construction, standard cam-lock connection system, to insure a sealed enclosure when erected. Ceilings to be white baked enamel. Provide stucco aluminum trim angles at all wall intersections with the building wall. Flame spread rating to be 25 or less.

Stainless steel insulated floor set on building floor.

Doors and door panel sections shall be positioned as shown on the drawings. Each door shall fit flush with box exterior; shall be equipped with a minimum of 2 cam-lift, self-closing hinges securely fastened to door frame; magnetic sealing door gasket, recessed light switch with pilot light, door frame heater, 14 gauge stainless steel threshold plate, 2" dial thermometer, cam-action locking handle with interior safety release, heated pressure relief port and audio alarm. Door to be a nominal 26" wide and stainless steel finished.

Interior lighting shall include one (1) standard 100 watt shielded vaporproof light fixture provided at the door opening, and one (1) extra light for field installation for inter-connection to door light switch. Refrigeration system shall consist of self-contained, top mounted air-cooled unit; refer to drawings for operation voltage and amperage.

Refrigeration systems shall be provided by same manufacturer as the walk-in cooler. Furnish a letter of certification that the compressor and coil system is sized correctly to operate and hold product at 0 degrees F. with a maximum run time of 80% and as a working cooler. Assume that product load will be room ambient; door open thermal loss of 10% for 4 hours per day, five out of seven days.

Refrigeration system shall consist of furnishing and installing complete refrigeration system. Furnish complete with permits, hook-ups, valves, building coves, controls, disconnects, start-up, and 1 year service after Final Acceptance. All work shall be performed in accordance with the City of Chicago Refrigeration Code and meet the minimum standards as set by the 1995 Montreal Convention.

1. Coils shall be flush, ceiling mounted.
2. Provide unit with sight glass, drier and liquid line assembly, and pressure relief valve. Pressure relief valve and all piping shall meet the Chicago Mechanical Code.
3. Condensate evaporator.
4. Electric defrost heater on drain line from the freezer coil.
5. Hi/low temperature alarm system.

Submit complete shop drawings and details for review prior to fabrication and installation.

**NOTE: ITEMS 2 AND 3 SHALL BE THE SAME MANUFACTURER**

**ITEM 3 KOLD LOCKER (R)**

Quantity and size as shown on drawings.

KOLPAK/McCALL  
641 N. McCORKLE PARK  
PARSONS, TN 38363  
901-847-5306  
901-847-9013 (FAX)  
MODEL #P6-066-FT

LEER MAUFACTURING  
206 LEER STREET  
NEW LISBON, WI 53950  
888-766-5337  
608-562-3166 (FAX)  
MODEL #G5-6X6

NOR-LAKE  
727 SECOND ST.  
HUDSON, WI 54016  
800-955-5253  
715-386-6149 (FAX)  
MODEL #KL-66

Same as specified for Item #2 except provide refrigeration to maintain +38 degrees Fahrenheit.

**ITEM 4 HAND SINK**

Quantity as shown on the drawings.

EAGLE GROUP  
100 INDUSTRIAL BLVD.  
  
CLAYTON, DE 19930  
800-441-8440  
FAX 302-653-2065  
MODEL HSA-10-F

ADVANCE TABCO  
200 HEARTLAND BLVD.  
SUITE T  
EDGEWOOD, NY 11747  
1-800-645-3166  
FAX 1-516-242-6900  
MODEL 7-PS-60

UNVERSAL STAINLESS  
2801 HUTCHINSON-MCDONALD  
  
CHARLOTTE, NC 28269  
1-800-925-1909  
FAX 1-704-599-1909  
MODEL CHS-1

Handsink shall be complete with faucet/strainer and wall mounting bracket. Handsink bowl shall measure nominal 12" x 10" x 5-1/2" overall with marine edge, made of 20 gauge, type 300 series stainless steel. Corner shall be minimum 1-3/4" coved; ends shall be turned back for safe, no-cut edges. Backsplash shall be 8" high with 2-3/4" tumbback at 45 degree angle, with all welded end caps. Welded areas shall be blended to match adjacent surfaces, then polished to No. 4 finish. Hand sink shall include splash-mounted, chrome-plated Chicago, T&S or Fisher faucet with wrist handles and swivel gooseneck spout with .5 GPM aerator.

**ITEM 5                      ROLL-THRU REFRIGERATOR**

Quantity as shown on the drawings.

TRAULSEN	VICTORY	TRUE MFG
11-402 15TH AVE.	110 WOODCREST RD.	PO BOX 970
COLLEGE POINT, NY	CHERRY HILL, N.J. 08003	O'FALLON, MO 63366
1-800-825-8220	856-428-4200	800-325-6152
FAX 1-718-961-1390	FAX 856-428-7299	FAX 314-272-2408
MODEL ARI (1) 32-LUTFHS	MODEL RISA-1D-S7	MODEL #TA1-RRT-1S1S

- Provide stainless steel trim and enclosure panels as shown on detail 12.
- Item #5 and #8 to be the same manufacturer.

**ITEM 6                      OVEN CARTS**

Mfg: Blodgett or approved equal  
Quantity as shown on drawings.

- Two (2) #CTRE-2 transport carts for each oven (four total).
- Four (4) #DBR-1L roll-in basket dollies for each oven (eight total).
- Porcelain finish for oven interiors.

**BASKET REQUIREMENTS**, each basket dolly shall be provided with fourteen (14) #136-12 wire baskets as manufactured by Marlin Steel Wire Products (#410-644-7456). Baskets shall be constructed of nickel chrome plated cold rolled steel wire. Basket top and bottom frame to be 1/4" diameter cold rolled steel. Crosswires of #11 gauge cold rolled steel shall be welded for form a 2" grid pattern and corner Vs for extra strength. The entire basket assembly is then to be nickel chrome plated. Basket shall measure 13-3/8" x 25-7/8" x 2-5/8". Total quantity baskets required is one hundred twelve (112).

**ITEM 7                      UTILITY CARTS**

Quantity and size as shown on drawings.

LAKESIDE	WILDER MFG CO.	PIPER PRODUCTS
1977 S. ALLIS ST.	41 MECHANIC ST.	300 S. 84 <sup>TH</sup> AVENUE
MILWAUKEE, WI 53207	P.O. BOX 1112	WAUSAU, WI
1-414-481-3900	PORT JERVIS, N.Y. 12771	800-544-3057
FAX 1-414-481-9313	1-914-856-5188	FAX 715-842-3125
MODEL #543	FAX 1-914-856-1950	MODEL #6-UCM-2
	MODEL #C2133S-2-NF	

- Corner bumpers

**ITEM 8      ROLL-THRU FOOD WARMER**

Quantity as shown on the drawings.

TRAULSEN  
11-402 15TH AVE.  
COLLEGE POINT, NY  
1-800-825-8220  
FAX 1-718-961-1390  
MODEL #AIH-132-L-FHS

VICTORY  
110 WOODCREST RD.  
CHERRY HILL, N.J. 08003  
856-428-4200  
FAX 856-428-7299  
MODEL #HISA-1D-S7

TRUE MFG.  
P.O. BOX 970  
O'FALLON, MO 63366  
800-325-6152  
FAX 314-272-2408  
MODEL #TA1HRT-1S1S

- Provide stainless steel trim and enclosure panels as shown on detail 12.
- Items 5 & 8 to be the same manufacturer.

**ITEM 9      MOBILE WORKTABLE**

Quantity and size as shown on the drawings.

Custom Fabricated, NSF, general construction per standard details

**TOP**, 14 gauge stainless steel, type 304 (18/8) with edge per detail 5d.

**UNDERSTRUCTURE**, 14 gauge galvanized channeling rigidly braced to top with studs and dome caps.

**UNDERSHELF**, 16 gauge stainless steel, type 304 (18/8) with edge to match top welded to legs.

**LEGS**, 1-5/8" diameter S/S, type 304 (18/8) (8) legs required.

**GUSSETS**, stainless steel conical type with inner sleeve and set screw.

**CASTERS**, 5" diameter polyurethane tires, all swivel, two (2) w/brakes.

**DRAWERS**, 20" x 20" x 5" deep, stainless steel drawer and housing.

**ITEM 10      THREE COMPARTMENT SINK**

Quantity and size as shown on drawings.

Custom fabricated, NSF, general construction per standard details.

**SINK**, 14 gauge stainless steel, type 304 (18/8) with 3/4" radius corners. Backsplash per details 3b and 4a against walls. Rim per detail 5b on free sides. Include lever wastes.

**PARTITIONS**, 14 gauge S/S, 5/8" thick double wall construction totally flush welded to sink body.

**DRAINBOARDS**, 14 gauge S/S integrally welded and of same construction as sink, sized per plan to have built in pitch to sink compartments.

**UNDERSTRUCTURE**, 14 gauge S/S triangular channeling welded to bottom.

**LEGS**, 1-5/8" diameter S/S, type 304 (18/8).

**GUSSETS**, stainless steel conical type with inner sleeve and set screw.

**FEET**, stainless steel adjustable bullet type.

**FAUCETS** - Two (2) required

- Chicago or T&S 15" minimum double jointed nozzle with 2.2 GPM aerator.



**ITEM 11 ROLL-IN CONVECTION OVEN**

BLODGETT OVEN CO. (OR APPROVED EQUAL)  
50 LAKESIDE AVE.  
P.O. BOX 586  
BURLINGTON, VT 05402  
802-860-3700  
802-864-0183 (FAX)  
MODEL #ZEPHAIRE, DOUBLE (GAS)

**STANDARD EXTERIOR FINISH**, shall consist of #430 stainless steel front, #3 finish and a dull heat resistant black enamel finish on the top, sides and back of oven.

**CONTROL PANEL**, shall be of stainless steel with independent controls. Control panel shall be completely removable for servicing.

**STANDARD BAKING COMPARTMENT INTERIOR**, including baffle to be of steel. Dimensions 29" wide x 20" high x 28-1/4" deep to front of baffle.

**INSULATION**, top, back and sides to be insulated with 1" thick, high temperature mineral fiber sheet.

**DOORS AND HANDLES**, a single handle mounted on each door to operate each door individually.

**TRACKS**, shall consist of stainless steel-formed guides mounted on the liner bottom.

**DOCKING AND LOCKING ASSEMBLY**, to be mounted on oven base to facilitate alignment for docking and locking of transport cart.

**VENTING**, oven baking chamber is continuously vented to oven exterior.

**THERMOSTATS**, each section shall be equipped with an electric, direct acting thermostat, which shall have a snap action mechanism and integral off-on switch. Range shall be 200 degrees F to 500 degrees F.

**TIMER**, 60-minute mechanical timer with bell.

**LISTING**, ovens are listed Underwriters Laboratories and National Sanitation Foundation. Each Convection Oven shall be provided with the following optional features:

- 6" stainless steel legs, solid doors in lieu of doors with windows.
- Safety restraining cable.

**ITEM 12 EXHAUST HOOD(S)**

Existing unit in place "as is."

**ITEM 13 MILK CASE COOLERS**

Quantity and size as shown on the drawings.

MOD-U-SERVE  
2320 PEYTON  
HOUSTON, TX 77032  
888-955-5463  
FAX 281-442-3351  
MODEL #MCT-DM2

BEVERAGE-AIR  
P.O. BOX 5932  
SPARTANBURG, SC 29304  
800-845-9800  
FAX 864-582-5083  
MODEL #ST49N

NOR-LAKE  
727 SECOND ST.  
HUDSON, WI 54016  
800-955-5253  
FAX 715-386-6149  
MODEL #AR-124

**ITEM 14 FROST TOP SERVING COUNTER**

Quantity as shown on the drawings.

All serving line components to be by the same manufacturer. 32" working counter top height all units.

DELFIELD	DUKE MFG. CO.	MOD-U-SERVE
P.O. BOX 470	2305 N. BROADWAY	2320 PEYTON
MT. PLEASANT, IL	ST. LOUIS, MO 63102	HOUSTON, TX 77032
1-800-733-8821	800-735-3853	888-955-5463
FAX 1-800-669-0619	FAX 314-231-5074	FAX 281-442-3351
MODEL #SE-F5	MODEL #TFT-74-SS	MODEL #MCT-FR5

**TOP**, fabricated of 16 ga., type 302 polished stainless steel, turned down 2" on edges, with all corners welded and perimeter marine edge. Frost top to be approximately 2" below the counter top.

**APRON**, full length x 10" high stainless steel apron.

**CASTERS**, mount on four (4) 5" diameter, heavy-duty, double ball bearing swivel casters with non-marking rubber tires. Two casters fitted with brakes adjust height to accommodate 32" work top.

**LOCKING DEVICE**, Cam-action latches with trigger releases to join multiple units together at the top to form a unitized serving line.

Include the following accessories:

1. Full length x 12" wide, solid, stainless steel, ribbed type tray slide set on stainless steel folding brackets.
2. Full length minimum 6" wide stainless steel work shelf on stainless steel folding brackets.
3. Full front panel and end enclosure panels with laminate or fiberglass finish.
4. Full length x full width stainless steel undershelf.
5. Full length double-deck display stand with plexiglas sneeze guards and end panels and stainless steel shelves. Each shelf to be fitted with a fluorescent light interwired with compressor cordset
6. Full length stainless steel kickplate across the front.

**ITEM 15 HOT FOOD SERVING COUNTER**

Quantity as shown on the drawings.

DELFIELD	DUKE MFG. CO.	MOD-U-SERVE
P.O. BOX 470	2305 N. BROADWAY	2320 PEYTON
MT. PLEASANT, IL	ST. LOUIS, MO 63102	HOUSTON, TX 77032
1-800-733-8821	800-735-3853	888-955-5463
FAX 1-800-669-0619	FAX 314-231-5074	FAX 281-442-3351
MODEL #SC-74	MODEL #TST-74-SS	MODEL #MCT-FT6

Same general materials, accessories, specifications and details to match Item #14, except delete the display stand specified under point 5. No display stand or sneeze guard is required.

**ITEM 16 CHECKER STAND**

Quantity as shown on the drawings.

DELFIELD	DUKE MFG. CO.	MOD-U-SERVE
P.O. BOX 470	2305 N. BROADWAY	2320 PEYTON
MT. PLEASANT, IL	ST. LOUIS, MO 63102	HOUSTON, TX 77032
1-800-733-8821	800-735-3853	888-955-5463
FAX 1-800-669-0619	FAX 314-231-5074	FAX 281-442-3351
MODEL #SCS-30	MODEL #TCS-30-SS	MODEL #MCT-CRSG

Same general materials, specifications and details to match Item #14.

1. Full length x 12" wide, solid, stainless steel, ribbed type tray slide set on stainless steel folding brackets.

**ITEM 17 TRAY DRYING RACK**

Quantity and size as shown on the drawings.

INTERMETRO INDUSTRIES CORP.	AMCO INDUSTRIES
NORTH WASHINGTON ST.	901 N. KILPATRICK AVE
WILKES-BARRE,	CHICAGO, IL 60651
PENNSYLVANIA 18705	800-621-4023
717-825-2741	FAX 312-379-5183
FAX 717-825-2852	MODEL: PP4824
MODEL: PR48VX	

Four (4) tiers high, all shelves equipped with removable shelf mats, tray drying inserts, and 5" diameter polyurethane tired casters, two (2) swivel with brakes. Include donut bumpers.

**ITEM 18 ANGLE RACKS**

Quantity as shown on the drawings.

NEW AGE	CRES-COR	CHANNEL
P.O. BOX 384	5925 HEISLEY ROAD	55 CHANNEL DRIVE
NORTON, KS 67654	MENTOR, OH 44060	PORT WASHINGTON, NY 11050
800-255-0104	877-273-7267	866-712-7283
FAX 913-817-2616	FAX 440-350-7267	FAX 516-944-6271
MODEL #1337	MODEL #207-1811C	MODEL #417-A-SL

Frame and cross supports shall be of 1" square tubing, extruded aluminum alloy, all welded construction with corner bumpers. Bottom shall be of solid aluminum alloy with aluminum hat channels welded underneath for recessing of casters. Tray slides shall be of extruded aluminum angles 5"± O.C. welded to the frame. Units shall be furnished with 5" diameter heavy duty, plate type casters two supplied with brakes and to be sized to fit into Items #5 and #8.

**ITEM 19 SPARE NUMBER**

**ITEM 20 TRAY CARTS**

Quantity as shown on the drawings.

DELFIELD	CADDY
P.O. BOX 470	711 CADDY DRIVE
MT. PLEASANT, IL	PITMAN, NJ 08071
1-800-733-8821	609-589-1550
FAX 1-800-669-0619	FAX 609-589-0220
MODEL DT-3SS	MODEL T-145

**FRAME**, constructed of 1" O.D. 16 ga. stainless steel tubing, with 3/4" O.D. integrally welded cross rails.  
**CABINET**, constructed of all-welded 18 ga. stainless steel, with edges flanged. Include a canted shelf with enclosed ends and full height back at an angle to support trays, with all interior corners covered to a 1/2" radius. Shelf to be set 14" above the floor and provide a 1/2" diameter hole to permit drainage.  
**CASTERS**, mounted on four (4) 4" diameter heavy-duty, double ball bearing swivel casters, two [2] with brakes.

Unit may be custom fabricated per the specifications.

**ITEM 21 REACH-IN FREEZER**

Quantity as shown on the drawings.

TRAULSEN	VICTORY	TRUE MFG
11-402 15TH AVE.	110 WOODCREST RD.	PO BOX 970
COLLEGE POINT, NY	CHERRY HILL, N.J. 08003	O'FALLON, MO 63366
1-800-825-8220	856-428-4200	800-325-6152
FAX 1-718-961-1390	FAX 856-428-7299	FAX 314-272-2408
MODEL #ALT 332-NUTFHS	MODEL #FA-3D-S7	MODEL #T-72F

- Casters

**ITEM 22 RECYCLING TRASH / COUNTER**

Custom fabricated, size and quantity per plan x 36" O.A. high.

- General construction per details 1, 2, 6, and 7
- Backsplash per details 3e and 4a against building walls.
- Rim per detail 5f
- Integral sink approximately 40" x 20" x 12" deep fitted with T&S or Chicago deck mounted faucet with 12" nozzle with loose keyed stops and 2.2 GPM aerator spout, and crumb cup basket drain. Provide hinged double pan door per detail 7. Omit bottom shelf in the cabinet base.
- Support top with Walsh-Simmons seating #BAS 30WL cantilevered table brackets spaced to accommodate the recycling bins, Item #23.
- Provide cutout in top with 1" turndown at rear and ends and 1" turn-up at front with radiused corners. Cutouts to be centered over recycling bins between top supports.

**ITEM 23      RECYCLING BINS**

Quantity and size as shown on the drawings.

RUBBERMAID COMMERCIAL PRODUCTS  
3124 VALLEY AVENUE  
WINCHESTER, VA 22601  
540-667-8700  
FAX 540-542-8821  
MODEL #3958

**ITEM 24      DUNNAGE RACKS**

Quantity and size as shown on drawings.

INTERMETRO INDUSTRIES CORP.  
NORTH WASHINGTON ST.  
WILKES-BARRE,  
PENNSYLVANIA 18705  
717-825-2741  
FAX 717-825-2852  
MODEL: A1460NK3/13PK3

AMCO INDUSTRIES  
901 N. KILPATRICK AVE  
CHICAGO, IL 60651  
800-621-4023  
FAX 312-379-5183  
MODEL: A1260/P08 Polygard

Steel core posts and traverse supports polypropylene coated. Open grid, removable shelf mats capable of being washed in a commercial dishwasher. Each unit to be sized per plan and adjusted per field conditions and to be 8" – 12" high.

**ITEM 25      FREEZER SHELVING**

Quantity and size as shown on drawings.

CAMBRO MFG. CO.  
7601 CLAY AVE.  
HUNTINGTON BEACH,  
CALIFORNIA 92648-2219  
800-854-7631  
FAX 714-842-3430  
MODEL: CAMSHELVING

INTERMETRO INDUSTRIES CORP.  
NORTH WASHINGTON ST.  
WILKES-BARRE,  
PENNSYLVANIA 18705  
717-825-2741  
FAX 717-825-2852  
MODEL: METROMAX

AMCO INDUSTRIES  
901 N. KILPATRICK AVE  
CHICAGO, IL 60651  
800-621-4023  
FAX 312-379-5183  
MODEL: PLASTIC PLUS

Provide shelving sections same as specified for Item #1. Sections to be sized per plan x approximately 64" high, with three (3) tiers. Delete casters.

**ITEM 26 REFRIGERATOR SHELVING**

Quantity and size as shown on drawings.

CAMBRO MFG. CO. 7601 CLAY AVE. HUNTINGTON BEACH, CALIFORNIA 92648-2219 800-854-7631 FAX 714-842-3430 MODEL: CAMSHELVING	INTERMETRO INDUSTRIES CORP. NORTH WASHINGTON ST. WILKES-BARRE, PENNSYLVANIA 18705 717-825-2741 FAX 717-825-2852 MODEL: METROMAX	AMCO INDUSTRIES 901 N. KILPATRICK AVE CHICAGO, IL 60651 800-621-4023 FAX 312-379-5183 MODEL: PLASTIC PLUS
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Provide shelving sections same as specified for Item #1. Sections to be sized per plan x approximately 64" high, with three (3) tiers. Delete casters.

**ITEM 27 TRASH CONTAINERS**

Quantity and size as shown on the drawings.

RUBBERMAID COMMERCIAL PRODUCTS  
3124 VALLEY AVENUE  
WINCHESTER, VA 22601  
540-667-8700  
FAX 540-542-8821  
MODEL #2655/2654

**ITEM 28 WASTE BASKETS**

Not in Division 11400

**ITEM 29 DISH WASHER**

Quantity as shown on the drawings.

CHAMPION INDUSTRIES P.O. BOX 4149 WINSTON-SALEM, NC 27115 336-661-1556 FAX 336-661-1979 MODEL #UH-170B	CMA 12700 KNOTT AVE. GARDEN GROVE, CA 92841 800-854-6417 FAX 714-895-2141 MODEL #180U.C	HOBART 701 S. RIDGE TROY, OHIO 45374 888-4HOBART FAX MODEL: LXi
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- Detergent and rinse aid pumps
- 6" legs
- Hot water sanitizing

**ITEM 30      DISH TABLE**

Quantity as shown on the drawings.

ADVANCE TABCO  
200 HEARTLAND BLVD.  
EDGEWOOD, NY 11719  
800-498-6634  
FAX 631-586-2933  
MODEL #DTU-U60-48L

EAGLE  
100 INDUSTRIAL BLVD.  
CLAYTON, DE 19938  
800-441-8440  
FAX 302-653-2065  
MODEL #UDT-4R-16/3

SELECT STAINLESS  
11145 MONROE ROAD  
MATTHEWS, NC 28105  
888-843-2345  
FAX 704-841-1590  
MODEL #52UD-L STANDARD

- 16 gauge, #304 stainless steel construction
- Extended height legs to accommodate 6" legs on Item #29.
- T&S, Chicago Faucet or Fisher backsplash mounted pre-rinse spray.

END OF SECTION

**SECTION 13121**  
**GYMNASIUM BLEACHERS**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Design, fabrication and erection of exterior bleachers in accordance with Contract Documents.
- B. Description: Provide beam supported, totally closed deck bleacher system including foundations, steel beam support system, aluminum seating, aisles, stairs, ramps, and closed railing, providing space for construction between columns.
  - 1. Number or Rows: As indicated on the drawings.
  - 2. Overall Length: As indicated on the drawings.
  - 3. Rise Per Row: 8 inches
  - 4. Depth Per Row: 24 inches
  - 5. Footboard Decking System: Closed deck with extrusions arranged vertically and horizontally so that no more than ¼ inch gap exists.
  - 6. Framework: Prefabricated angle bleacher frames are spaced at 6-foot intervals and connected by crossbraces
  - 7. Footboard Extrusions: Two nominal 2 x 11 mill aluminum planks with 2 x 11 anodized end caps
  - 8. Seat Board Extrusions: Nominal 2 x 10 anodized aluminum plank with 2 x 10 anodized end caps.
  - 9. Aisles: Aisle to be 4'-6" wide with 34" high handrail and intermediate rail at approximately 22" above tread. Handrails with rounded ends are discontinuous to allow access to seating through a 24" wide space. Aluminum tread nosing of contrasting color on aisle steps.
  - 10. Wheelchair Accessible Area: Wheelchair area to be 5' 6" wide. There are two spaces per wheelchair area 33" in depth.

1.2 SUBMITTALS

- A. Product Data: Submit complete printed data identifying components to be provided, demonstrating compliance with Contract Documents.
  - 1. Submit color charts for selections by the Architect.
- B. Shop Drawings: Submit complete layout, fabrication and erection shop drawings, signed and sealed by a State of Illinois licensed Structural Engineer with a statement attesting compliance with "Design Requirements" specified.
- C. Design Mix: Submit design mix for ready-mixed concrete.
- D. LEED Submittals:
  - 1. Credit MR 4.1[ and Credit MR 4.2]: Submit product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products



having recycled content. Include statement indicating costs for each product having recycled content.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Regularly engaged in the design, fabrication and erection of bleacher systems of the type required as a primary business for a minimum of ten (10) years.
- B. Erector: Experience in the erection of bleacher systems of the type required for a minimum of ten (10) years and approved by the system manufacturer.
- C. Regulatory Requirements:
  - 1. Comply with requirements for access of the American's with Disabilities Act, Illinois Environmental Act and City of Chicago Accessibility Requirements.
  - 2. Comply with requirements of authorities having jurisdiction.
- D. Design Loads:

Dead Load	6 psf	Seat and foot boards, risers, steel frame, etc.
Live Load	100 psf	to structural member
Live Load	120 plf	seat and foot boards
Lateral Sway	24 plf	Seat plank
Perpendicular Sway	10 plf	parallel per ft. of seat
Guard Rail	100plf / 50plf	parallel to seat run
		Vertical/ Horizontal
- E. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
  - 1. Concentrated load of 300 lbf applied at any point nonconcurrently, vertically downward, or horizontally.
  - 2. Uniform load of 100 lbf per linear ft. applied nonconcurrently, vertically downward or horizontally.
  - 3. Concentrated and uniform loads above need not be assumed to act concurrently.
- F. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
  - 1. Concentrated load of 200 lbf applied at any point nonconcurrently, vertically downward or horizontally.
  - 2. Uniform load of 50 lbf per linear foot applied nonconcurrently, vertically downward or horizontally.
  - 3. Concentrated and uniform loads above need not be assumed to act concurrently.
- G. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf applied to one sq. ft. at any point in the system including panels, intermediate rails balusters, or other elements composing the infill area.
  - 1. Above load need not be assumed to act concurrently with uniform horizontal loads on top rails of railing systems in determining stress on guard.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable Manufacturers: Subject to compliance with Drawing and Specification requirements; one of the following:
  - 1. All Star Bleachers
  - 2. Dant-Clayton Corp
  - 3. E & D Specialty Stands
  - 4. Southern Bleacher
  - 5. Stubdisteel

### **2.2 MATERIALS**

- A. LEED Requirement
  - 1. Maximize the amount of recycled materials in the products
- B. Structural Steel:
  - 1. Structural steel (plates, wide flange shapes, channels, and angles) ASTM A 36, hot dipped galvanized after fabrication.
  - 2. Bolts: ASTM A 307 and ASTM A 325
  - 3. Threaded Rod: ASTM A 36 hot dipped galvanized.
  - 4. Electrodes: E70XX.
- C. Guard Rail System:
  - 1. Handrails: Anodized aluminum extruded pipe 60612-T6 alloy, 1-5/8" o.d.
  - 2. Handrail Supports: Aluminum channel 3" x 1.438" x .188, 6061-T6 alloy.
  - 3. Chain Link Fence: 2" mesh, 9 gauge galvanized fabric.
- D. Extrusions:
  - 1. Seats: 6063-T6 extruded aluminum with a fluted surface and a wall thickness of .078".
  - 2. Foot boards and tow boards: 6063-T6 of .078".
  - 3. Riser boards: 6063-T6 extruded aluminum.
- E. Stairs, Ramps and Platforms:
  - 1. Frames: Hot dipped galvanized A36 steel channel.
  - 2. Treads: 6063-T6 extruded aluminum with a fluted surface and a wall thickness of .078".
- F. Hardware:
  - 1. Bolts: Galvanized.
  - 2. End Caps:
    - a. Seatboard end caps: Injection molded high-density polyethylene.
    - b. Walkway, Footboard and Aisle Board End Caps: One-piece mill finish aluminum channel design and shall be riveted to the underside of the plank.
    - c. Handrail Posts: Capped with a cast aluminum cap.

### **2.3 FINISHES**

- A. Steel:
  - 1. Provide a zinc coating after fabrication of all elements, as follows:

- a. ASTM A 153 for galvanizing iron and steel hardware.
  - b. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars.
  2. Fabricate joints, which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- B. Provide anodized aluminum finish for all components except footboards, treads and ramp surfaces may be mill finish.  
Provide finish complying with NAAMM Specifications AA-M10/12C22A41 (medium matte, non-directional; minimum 0.7 mil clear anodized).

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Lay out foundation piers and obtain Architect's approval.

#### **3.2 REINFORCED CONCRETE PIERS:**

- A. Cast-In-Place Concrete: Minimum compression strength of 3,000 psi at 28 days, air entrained to 6% +/-1% conforming to ATM C 94.
- B. Reinforcing: ATM A 615 Grade 60.
- C. Cover on reinforcement, unless otherwise noted in the specifications and drawings:
  1. 3" place directly against earth.
  2. 2" concrete exposed to earth or weather poured against forms.
  3. 1-1/2" (Columns (to ties)).
- D. Excavate to a minimum depth of 4'-0" below finish grade. Allow Owner's testing service to view excavation before concrete is placed. If deeper excavation is required, the cost of such excavation and concrete shall be an extra to the Contract.

#### **3.3 ERECTION**

- A. Erect in accordance with shop drawings and in accordance with ALSC specifications.
- B. Adequately brace the structure for wind and construction loads until all structural elements, seat and foot boards have been placed. Individual stringer supports will not be accepted. Cross-braced lateral and longitudinal bays shall be where required.
  1. Columns: Minimum 6-inch wide flange shapes.
  2. Support Beams: Minimum 12-inch or 14-inch wide flange.
  3. Stringers: Minimum 12-inch wide flange beams.

#### **3.4 CLEANING**

- A. Clean all surfaces according to the manufacturer's recommendations.
- B. Legally remove all packing materials and construction debris.

END OF SECTION

[on GC's letterhead]

**LEED MONTHLY REPORT – LEED for Schools  
PUBLIC BUILDING COMMISSION OF CHICAGO**

Project Name:

Location:

Project No:

Report for Period of: \_\_\_\_\_

NTP: \_\_\_\_\_

Date of Report: \_\_\_\_\_

Contract end date: \_\_\_\_\_

**Monthly Report Narrative:**

*(Brief description of progress / changes to LEED documentation and prerequisites over the course of the month)*

**Erosion and Sedimentation Control Plan**

*(Attach drawing / plan showing any modifications over the past month, and photos of maintained Controls. Weekly updates may be required / submitted.)*

**Waste Management Plan**

*(Attach updated log.)*

Target\* Diverted \_\_\_\_\_% Current Status \_\_\_\_\_%

**Materials and Resources Plan**

*(Attach updated log(s))*

\_\_\_\_\_ % materials submittals made to date;  
By \$, based on (default 45% OR actual materials cost)

	Target*	Current Status
Resource Reuse (MR 3)	_____	_____
Recycled Content (MR 4)	_____	_____
Regional Materials (MR 5)	_____	_____
Rapidly Renewable Materials (MR 6)	_____	_____
Certified Wood (MR 7)	_____	_____

**Low Emitting Materials**

*(Attach updated log; budget if required; Edit for credits sought)*

\_\_\_\_\_ % materials submittals to date by # products.  
Indicate compliance path (L4S or NC 2.2).

	Compliance Path	Current Status
Adhesives & Sealants	_____	_____
Paints & Coatings	_____	_____
Flooring Systems	_____	_____
Composite Wood, Agrifiber	_____	_____
Furniture & Furnishings	_____	_____
Ceiling and Wall Systems	_____	_____

**Construction IAQ Management Plan**

*(Narrative – insert or attach. Attach log, and 3-6 photos from month to document LEED requirements being met. Select photos to address SMACNA guidelines)*

target / actual start dates \_\_\_\_\_

**Commissioning (Cx) Activities**

*(Narrative – insert or attach - subcontractor activities to address Cx Plan requirements; upcoming milestones):*

\* Targets from LEED Scorecard and/or Specifications. Note if additional % sought for ID credit.

Materials Table

Description of Material	Total Construction Cost	Material Cost Estimated (= 45% of Total Construction Cost)	Material Cost Actual	Recycled Content		Value (= Post + 1/2 Pre Consumer)	MR Credit 4		MR Credit 5		Name of Manufacturer	Location of manufacturing Plant miles	Location of materials harvest miles	Information Source	
				Post-Consumer	Pre-Consumer		Local/Regional Materials Harvested and Manufactured	New Wood-Based Materials	Certified Wood						
				[%]	[%]		[\$]	[\$]	[\$]						
<b>02 SITEWORK</b>															
02222 Excavation, Backfilling	In 02300	\$0	\$0												
02300 Earthwork	\$2,250,000	\$1,012,500	\$0												
02466 Drilled Piers - Concrete Mix 1525			\$58,500	0%	19%	\$5,558					Ozinga	11	11		
02466 Drilled Piers - Rebar			\$10,638	97%	3%	\$10,638					Gerdau	100	452		
02511 Bituminous Conc. Paving	\$142,000	\$63,900	\$0												
02513 Portland Cem. Concr. Paving - Mix L115			\$52,740	0%	3%	\$791					Prairie	5	352		
02513 Portland Cem. Concr. Paving - Mix L244			\$4,500	0%	3%	\$68					Prairie	5	352		
02515 Arch. Precast Concr. Pavers	In 02900	\$0	\$0												
02620 Under-Drainage System	\$224,000	\$100,800	\$0												
02700 Sewerage & Drainage	In 02620	\$0	\$0												
02707 Water Service	In 02620	\$0	\$0												
02780 Unit Pavers	\$315,000	\$141,750	\$0												
02781 Porous Unit Paving	In 02900	\$0	\$0												
02790 Tennis Court Surface	\$17,468	\$7,861	\$0												
02793 Synthetic Grass Surface	\$356,336	\$160,351	\$0												
02821 Tennis Court Enclosure	\$61,500	\$27,675	\$0												
02831 Chain-Link Fences and Gates	In 02821	\$0	\$0												
02870 Bicycle Racks	In 02900	\$0	\$0												
02873 Site Furnishings	In 02900	\$0	\$0												
02900 Landscaping	\$885,000	\$389,250	\$0												
02901 CU Structural Soil	In 02900	\$0	\$0												
02902 Tree Grates - Landscaping	In 02900	\$0	\$0												
02910 Native Landscaping	In 02900	\$0	\$0												
02930 Green Roof Module System	In Roofing	\$0	\$0												
02940 Stabilized Gravel - Pedestrian Access	In 02900	\$0	\$0												
02985 Lawn	In 02900	\$0	\$0												
<b>03 CONCRETE</b>															
03300 CIP - Form-Release Agent		\$500	\$500	0%	90%	\$225					L&M	>600	>600		
03300 CIP - Plain-Steel Welded Wire		\$40,200	\$40,200	35%	50%	\$24,120					Insteel	373	?	?	
03300 CIP - Self-Expanding Waterstop		\$800	\$800	0%	3%	\$12					Getco	285	?	?	
03300 CIP - Vapor Retarder		\$13,060	\$13,060	0%	0%	\$0					Stego	>500	>500		
03300 CIP - Curing Compound		\$650	\$650	5%	0%	\$33					BASF	131	?	?	
03300 CIP - Joint-Filler Strips		\$2,800	\$2,800	0%	95%	\$1,330					WR Meadows	47	?	?	
03300 CIP - Dovetail Anchor Slots		\$1,200	\$1,200	72%	23%	\$1,002					Dur-O-Wal	34	?	?	
03300 CIP - Concrete Mix L138		\$90,585	\$90,585	0%	3%	\$1,359					Prairie	5	Max 352		
03300 CIP - Concrete Mix L3041		\$289,800	\$289,800	0%	4%	\$5,796					Prairie	5	Max 352		
03300 CIP - Concrete Mix L426		\$2,700	\$2,700	0%	3%	\$41					Prairie	5	Max 352		
03300 CIP - Concrete Mix L145		\$34,110	\$34,110	0%	4%	\$682					Prairie	5	Max 352		
03300 CIP - Rebar		\$483,300	\$483,300	87%	13%	\$451,886					Rockford	70	50		
03401 Miscellaneous Precast Concrete Units	In 03411	\$0	\$0												
03411 Precast Concrete Hollow Core Plank	\$1,510,000	\$679,500	\$0			\$0									
<b>04 MASONRY</b>															
04200 Unit Masonry - CMU Block		\$257,672	\$257,672	0%	26%	\$33,497					Elston Material	11	24		
04200 Unit Masonry - Glazed Brick & SGFT		\$3,610,896	\$3,610,896	0%	0%	\$0					Elgin Butler	>500	>500		
04200 Unit Masonry - Reinforcing Bar		\$132,131	\$132,131	83%	17%	\$120,699					Nucor	55	?	?	
04200 Unit Masonry - Wire Reinforcing Single		\$22,007	\$22,007	67%	18%	\$16,725					Dur-O-Wal	42	?	?	

Materials Table

Description of Material	Total Construction Cost	Material Cost Estimated (= 45% of Total Construction Cost)	Material Cost Actual	Recycled Content		Value (= Post + 1/2 Pre Consumer)	MR Credit 5		MR Credit 7		Name of Manufacturer	Location of manufacturing Plant	Location of materials harvest	Information Source
				Post-Consumer	Pre-Consumer		Local/Regional Harvested and Manufactured	New Wood-Based Materials	Certified Wood					
	[\$]	[\$]	[\$]	[%]	[%]	[\$]	[\$]	[\$]	[\$]	[\$]	mi	mi	mi	
04200 Unit Masonry - Wire Reinforcing Mult Wythe			\$24,655	67%	18%	\$18,738	\$24,655				Dur-O-Wal	42	?	
04200 Unit Masonry - Control Joint Strips			\$8,758	0%	50%	\$2,189	\$8,758				Dimex Corporation	481	?	
04200 Unit Masonry - Weep Hole Ventilator			\$3,735	0%	0%	\$0	\$3,735				Dur-O-Wal	441	?	
04200 Unit Masonry - Cavity Drainage Material			\$12,879	35%	0%	\$4,508	\$12,879				Mortar Net USA	28	?	
04200 Unit Masonry - Rubberized Flashing			\$5,342	0%	8%	\$214	\$5,342				Illinois Products	44	?	
04200 Unit Masonry - Cavity Insulation			\$111,804	1%	0%	\$12,298	\$111,804				DOW	187	?	
04200 Unit Masonry - Mortar			\$121,050	0%	0%	\$0	\$121,050				Max-Mix	11	285	
04200 Unit Masonry - Grout			\$111,841	0%	0%	\$0	\$111,841				Max-Mix	11	285	
04851 Dimension Stone Cladding	In 04200		\$0			\$0								
			\$0											
<b>05 METALS</b>														
05120 Structural Steel	\$4,830,400	\$1,261,000	\$0			\$0								
05210 Steel Joists	In 05120	\$270,313	\$0			\$0								
05300 Acoustic Metal Deck	In 05120	\$170,000	\$0			\$0								
05311 Steel Roof Deck	In 05120	\$0	\$0			\$0								
05312 Steel Floor Deck	In 05120	\$0	\$0			\$0								
05400 Cold Formed Metal Framing	In 09260	\$0	\$0			\$0								
05500 Metal Fabrication	\$905,000	\$407,250	\$0			\$0								
05581 Metal Column Covers	\$77,000	\$34,650	\$0			\$0								
05721 Glass Railing System	In 05500	\$0	\$0			\$0								
05810 Expansion Joint Assemblies	\$8,200	\$3,690	\$0			\$0								
<b>06 WOODS &amp; PLASTICS</b>														
06101 Carpentry	\$45,000	\$20,250	\$0			\$0								
06400 Architectural Woodwork	\$261,260	\$117,567	\$0			\$0								
06401 Modular Casework	In 06400	\$0	\$0			\$0								
			\$0											
<b>07 THERMAL / MOISTURE PROTECTION</b>														
07115 Bituminous Dampproofing			\$6,000	0%	0%	\$0	\$6,000				Max-Mix	11	285	
07131 Sheet Waterproofing - Bituminous Sheet			\$6,000	0%	0%	\$0	\$0				Carlisle	>500	>500	
07131 Sheet Waterproofing - Drainage Panel			\$7,000	0%	0%	\$0	\$0				Carlisle	>500	>500	
07131 Sheet Waterproofing - Adhesives			\$4,000	0%	0%	\$0	\$0				Carlisle	>500	>500	
07131 Sheet Waterproofing - Board Insulation			\$7,000	0%	0%	\$0	\$7,000				DOW	35	?	
07142 Rubberized Asphalt - Membrane			\$7,000	1%	8%	\$365	\$7,000				Tremco	431	?	
07142 Rubberized Asphalt - Protection Course			\$500	0%	0%	\$0	\$500				Tremco	314	?	
07142 Rubberized Asphalt - Primer			\$1,200	0%	5%	\$31	\$1,200				Tremco	443	?	
07142 Rubberized Asphalt - Reinforcing Fabric			\$800	0%	25%	\$100	\$800				Tremco	443	?	
07142 Rubberized Asphalt - Board Insulation			\$20,000	0%	0%	\$0	\$20,000				DOW	35	?	
07210 Building Insulation - Foundation			\$4,800	0%	40%	\$960	\$4,800				DOW	35	?	
07215 Spray-On Insulation	\$249,000	\$112,050	\$0			\$0								
07413 Metal Wall Panels	\$654,100	\$294,345	\$0			\$0								
07415 Composite Metal Panels	\$622,000	\$279,900	\$0			\$0								
07550 Mod. Bit. Sheet Roofing	\$1,730,000	\$778,500	\$0			\$0								
07620 Metal Flashing & Trim	In 07550	\$0	\$0			\$0								
07700 Roof Accessories	In 07550	\$0	\$0			\$0								
07725 Heat/Smoke Vents	\$27,000	\$12,150	\$0			\$0								
07811 Sprayed Fire Res. Mat's	In 07215	\$0	\$0			\$0								
07816 Sprayed Intumescent FR Material	In 07215	\$0	\$0			\$0								

Materials Table

Description of Material	Total Construction Cost	Material Cost Estimated (= 45% of Total Construction Cost)	Material Cost Actual	Recycled Content		MR Credit 4		MR Credit 5		MR Credit 7		Name of Manufacturer	Location of manufacturing Plant	Location of materials harvest	Information Source
				Post-Consumer	Pre-Consumer	Value (= Post + 1/2 Pre Consumer)	Local/Regional Materials Harvested and Manufactured	New Wood-Based Materials	Certified Wood	Location of manufacturing Plant	Location of materials harvest				
	[\$]	[\$]	[\$]	[%]	[%]	[\$]	[\$]	[\$]	[\$]	[\$]	[\$]		miles	miles	
07841 Thru-Penetr. Firestopping	By Trades	\$0	\$0			\$0									
07900 Joint Sealers	\$135,000	\$60,750	\$0			\$0									
07920 Acoustic Sealants	In 07900	\$0	\$0			\$0									
<b>08 DOORS &amp; WINDOWS</b>															
08110 Steel Doors & Frames	\$500,173	\$225,078	\$0			\$0									
08130 Stainless Steel Doors and Frames	In 08110	\$0	\$0			\$0									
08211 Int. Flush Wood Doors	In 08110	\$0	\$0			\$0									
08312 Access Doors & Frames	\$7,500	\$3,375	\$0			\$0									
08331 Overhd. Coiling Ctr. Doors	\$149,015	\$67,057	\$0			\$0									
08332 Overhd. Coiling Fire Doors	In 08331	\$0	\$0			\$0									
08340 Overhd. Heavy Duty Roll-Up Fire Dr	In 08331	\$0	\$0			\$0									
08411 Aluminum Entrances & Framing	\$2,125,000	\$956,250	\$0			\$0									
08411 Alum Ent. & Framing - Glazing	In 08411	\$0	\$0			\$0									
08520 Aluminum Windows	In 08411	\$0	\$0			\$0									
08520 Aluminum Windows - Glazing	In 08411	\$0	\$0			\$0									
08661 Ext. Metal Window Guards	In 08411	\$0	\$0			\$0									
08710 Finish Hardware	In 08110	\$0	\$0			\$0									
08716 Overhead Automatic Door Operators	\$12,383	\$5,572	\$0			\$0									
08718 Under Floor Automatic Door Operators	\$20,711	\$9,320	\$0			\$0									
08801 Interior Glazing	In 08411	\$0	\$0			\$0									
08910 Alum. Window Wall	In 08411	\$0	\$0			\$0									
08910 Alum. Window Wall - Glazing	In 08411	\$0	\$0			\$0									
<b>09 FINISHES</b>															
09220 Cement & Plaster	\$270,350	\$121,658	\$0			\$0									
09260 Gypsum Wallboard Sys. - Framing	\$1,284,841	\$578,178	\$0			\$0									
09260 Gypsum Wallboard Sys. - Boards	In above	\$0	\$0			\$0									
09270 Drywall Shaft Systems	In 09260	\$0	\$0			\$0									
09300 Ceramic Tile	\$285,000	\$128,250	\$0			\$0									
09410 Terrazzo	\$1,427,000	\$642,150	\$0			\$0									
09510 Acoustical Ceiling	In 09515	\$0	\$0			\$0									
09515 Cementitious Wood Fiber Ceilings	\$545,000	\$245,250	\$0			\$0									
09644 Wood Gym Floor	\$194,650	\$89,593	\$0			\$0									
09648 Wood Stage Floor	In 09644	\$0	\$0			\$0									
09650 Resilient Tile Flooring	\$131,176	\$59,029	\$0			\$0									
09668 Rubber Flooring	In 09650	\$0	\$0			\$0									
09678 Resilient Wall Base	In 09650	\$0	\$0			\$0									
09680 Carpet	In 09650	\$0	\$0			\$0									
09705 Resinous Flooring	\$134,000	\$60,300	\$0			\$0									
09820 Sound Isolation Pad		\$0	\$0			\$0									
09841 Acoustical Wall Panels	\$75,525	\$33,986	\$0			\$0									
09900 Painting	\$285,000	\$128,250	\$0			\$0									
09900 Graffiti Resistant Coating	In 09900	\$0	\$0			\$0									
<b>10 SPECIALTIES</b>															
10101 Visual/Display Units	\$31,000	\$13,950	\$0			\$0									
10155 Toilet Compartments	\$64,600	\$29,070	\$0			\$0									

Contractor Name

Project Name  
Address

LEED MR Tracking

Materials Table

Description of Material	Total Construction Cost	Material Cost Estimated (= 45% of Total Construction Cost)	Material Cost Actual	MR Credit 4		MR Credit 5	MR Credit 7		Location of manufacturing Plant	Location of materials harvest	Information Source
				Post-Consumer [%]	Pre-Consumer [%]		Local/Regional Materials Harvested and Manufactured	New Wood-Based Materials			
10200 Louvers	\$28,850	\$12,983	\$0						miles	miles	
10350 Flagpoles	\$5,950	\$2,678	\$0								
10425 Metal Letters	\$38,893	\$17,502	\$0								
10431 Exterior Signs	In 10425	\$0	\$0								
10433 Signage	In 10425	\$0	\$0								
10434 Exterior Emergency Signs	In 10425	\$0	\$0								
10450 Pedestrian Control System	\$977	\$440	\$0								
10500 Metal Lockers	\$447,500	\$201,375	\$0								
10522 Fire Ext. Cabinets & Acc.	\$5,800	\$2,610	\$0								
10610 Folding Security Gates	\$22,030	\$9,914	\$0								
10801 Toilet Accessories	\$45,531	\$20,489	\$0								
<b>TOTAL</b>	<b>\$23,383,719</b>	<b>\$10,050,307</b>	<b>\$5,573,313</b>				<b>\$714,063</b>	<b>\$0</b>			<b>\$0</b>

Material Cost Tracking:

Total Construction Cost (Division 2-10) \$23,383,719

Default Project Materials Cost (45% of Division 2-10 cost) \$ 10,522,674

**Total Material Cost (Estimated + Actual) \$15,623,620**

Material Submittals to Date (% based on \$) 36%

Percentage of Recycled Content (MR Credit 4.1 and 4.2) Target 20% Calculated 5%

Local/Regional Materials Percentage (MR Credit 5.1 and 5.2) Target 20% Calculated 12%

Certified Wood Percentage (MR Credit 7.0) Target 50% Calculated #DIV/0!

CONTRACTOR TO ADD SITE PREP CONTRACTOR MATERIAL COST TO TOTAL; PBC TO PROVIDE

UPDATE LOG MONTHLY TO PARALLEL APPROVED SUBMITTAL LOG



Contractor Name  
Project Name  
Address

Low Emitting Materials Log  
EQ Credits 4.1, 4.2, 4.3, 4.4

Low Emitting Materials, Adhesives and Sealants EQ4.1						
Spec No.	Product Application	Product Name / Manufacturer	VOC Level (g/L)	VOC Limit (g/L)	LEED for Schools Compliant	Source Data / Manufacturer Supporting Information
071326	Contact Adhesive	CCW-702 WB High-Tack Water Based Contact Adhesive				
092900	Drywall Adhesive	Sheetrock Plus 3 Joint Compound				
09260		Gypsum Wallboard Sys. Boards				

Low Emitting Materials, Paints and Coatings EQ4.2						
Spec No.	Product Application	Product Name / Manufacturer	VOC Level (g/L)	VOC Limit (g/L)	LEED for Schools Compliant	Source Data / Manufacturer Supporting Information

Low Emitting Materials, Flooring Systems (Carpet) EQ4.3						
Spec No.	Product Application	Product Name / Manufacturer	CRI Green Label Plus Compliant	LEED for Schools Compliant	Manufacturer Supporting Information	

Low Emitting Materials, Composite Wood and Agrifiber Products EQ4.4						
Spec No.	Product Application	Product Name / Manufacturer	Added Urea-Formaldehyde (yes / no)	LEED for Schools Compliant	Manufacturer Supporting Information	

Low Emitting Materials, Ceiling & Wall Systems EQ4.6 (EQ 4.5 not within contractor control)						
Spec No.	Product Application	Product Name / Manufacturer	LEED for Schools Compliant	Manufacturer Supporting Information		