

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

#### **PART 1 – GENERAL**

##### **1.01 RELATED DOCUMENTS**

- A. The drawings, and requirements of the General Conditions, Supplementary Conditions, and Division 1, General Requirements.**
- B. Section 05 4000 Cold Formed Metal Framing**
- C. Section 06 1000 Rough Carpentry**
- D. Section 07 2100 Thermal Insulation**
- E. American Iron and Steel Institute (AISI)**
  - 1. TS-1-02 Rotational-Lateral Stiffness Test Method for Beam-to-Panel Assemblies**
  - 2. TS-3-02 Standard Methods for Determination of Uniform and Local Ductility**
  - 3. TS-4-02 Standard Test Method for Determining the Tensile and Shear Strength of Screws**
  - 4. TS-5-02 Test Methods for Mechanically Fastened Cold-Formed Steel Connections**
  - 5. TS-6-02 Standard Procedures for Panel and Anchor Structural Tests**
- F. American Society for Testing and Materials (ASTM)**
  - 1. A 653-06 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process**
  - 2. C 270-07 Mortar for Unit Masonry**
  - 3. C 1088-07 Thin Veneer Brick Units Made from Clay or Shale**
  - 4. C 1439-99 Standard Test Methods for Polymer-Modified Mortar and Concrete**
  - 5. D 1761-06 Mechanical Fasteners in Wood**
  - 6. E 72-05 Standard Strength Tests of Panels for Building Construction**
  - 7. E 330-02 Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference**
  - 8. E 518-03 Flexural Bond Strength of Masonry**

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

#### 1.02 DESCRIPTIONS

- A. This section describes the requirements for thin brick masonry panels attached to pressed-metal backing and supported by cold formed metal framing.
1. The cold formed metal framing system consists of wall brackets, vertical 'L' track, and horizontal 'U' track that attach to each other and the substrate of the wall via screws.
  2. The masonry panels consist of thin brick mounted on a pressed metal backing via polymer modified mortar.
  3. The thin brick masonry panels are hung on the cold formed metal framing 'U' track via clips on the pressed metal backing. Screws are used to tie the panels to each other.
  4. All mortar joints, where the metal panel backing overlap is exposed, are then grouted in the field.

#### 1.03 QUALIFICATION REQUIREMENTS

- A. Manufacturer:
1. A history of corporate experience with metal supported unit masonry panels and cold formed metal framing systems
  2. Documented qualifications and capabilities that fully describe the ability to provide the required metal supported unit masonry panel system and technical support to the Owner.
  3. At least five (5) completed projects over the last three years, illustrating system performance equal or greater to the criteria listed in this specification.
    - a. Include the award date, the completion date, the contract value, and the name and telephone number of a person employed by the Owner who has personal knowledge of the manufacturer's contractual and technical performance.
- B. Contractor
1. The contractor must be certified by the manufacturer as a qualified installer.

**SECTION 04 2513**

**METAL SUPPORTED UNIT MASONRY PANELS  
GUIDE SPECIFICATION**

---

**1.04 DESIGN CONSIDERATIONS**

- A. The recommended starting height for the curtain-wall must allow for unobstructed air flow.**
- B. The ventilation (curtain wall) gap is always 1” and must not be obstructed by flashing, etc.**
- C. The minimum width, after cutting, for thin brick panels is 8”.**
- D. The frequency and spacing of the wall brackets (and vertical ‘L’ track) shall be determined by the engineer of record.**
- E. Additional horizontal ‘U’ mounting track may be required where panel size, penetrations, or vibration and loading dictate.**
- F. Expansion joints should be incorporated at ~ 24’ intervals.**

**1.05 SUBMITTALS**

- A. General: Submit each item in this Article according to the General Conditions of the Contract.**
- B. Manufacturer:**
  - 1. Product literature, catalogs, and descriptions of any testing that has been performed on the system components to indicate that they will have performance capabilities equal or greater to the criteria listed in this specification. Include information and samples for the following items.**
    - a. Wall brackets**
    - b. Vertical track**
    - c. Horizontal track**
    - d. Hardware**
    - e. Metal panel backing**
    - f. Thin brick**
    - g. Polymer modified mortar**
    - h. Unit masonry composite panel**
    - i. Joint Sealant**
    - j. Insulation**
    - k. Seismic rivet**
  - 2. Certificate of Conformance: Manufacturer's certification that materials are physically and chemically compatible with each other, that materials are in compliance with performance requirements of this specification, and that each material and/or equipment is suitable for the intended purpose.**
  - 3. Material Safety Data Sheets (MSDS) for the system components.**

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

#### **C. Contractor**

- 1. Certification by the manufacturer.**
- 2. Name of certified superintendent and/or foreman who will oversee the installation.**
- 3. Shop drawings by a licensed structural engineer detailing the installation of the system.**

#### **1.05 QUALITY ASSURANCE**

- A. All components shall be provided by one manufacturer.**
- B. All work shall be performed by the certified installer.**
- C. The design shall be provided by a Professional Engineer (S.E.) experienced in the design of curtain wall systems and licensed in the applicable state.**
- D. All applicable cure times and environmental conditions for field grouted joints shall be strictly adhered to.**
- E. A Mock-Up of the system shall be installed at the request of the owner to illustrate substrate, framing, insulation, panel, corner return and penetrations, and to allow for approval of exterior finishes and aesthetic appearance.**
- F. Pre-installation Conference: Conduct a pre-installation conference to include the owner's representative, project architect, structural engineer, manufacturer's rep, general contractor, installation subcontractor.**

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in manufacturer's original unopened containers or wrapped with labels intact and legible.**
- B. Store and protect materials from damage and weather in accordance with the manufacturer's instructions. Keep materials clean and dry at all times.**
- C. Handle materials in accordance with manufacturer's recommendations.**

#### **1.07 JOB CONDITIONS**

- A. Environmental Requirements:**
  - 1. Do not install any materials until conditions are in accordance with manufacturer's recommendations.**

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

#### 1.08 WARRANTY

- A. The manufacturer shall furnish a twenty year warranty for the cold formed metal framing, thin brick panels, and mortar joint grout starting from the date of Owner's acceptance of the Work, to cover replacement of all defective materials found within the term of the warranty.
- B. The installer shall furnish a one year warranty, starting from the date of Owner's acceptance of the Work, to cover replacement of all materials found to be defective due to workmanship during the term of the warranty.
- C. Warranties are limited to replacement of defective materials, including labor, as required resulting from framing and panel system component or performance failures. Warranties exclude repairs, replacement, and corrective work to the substrate, structure, and/or property. Warranties exclude mechanical damage due to abuse or neglect, structural failure, or forces of nature greater than normal weather conditions.

#### PART 2 – PRODUCTS

##### 2.01 GENERAL

- A. Products may be dimensioned in either Metric or English units. All design calculations, details and shop drawings shall take this fact into account.

##### 2.02 COLD FORMED METAL FRAMING

- A. All components shall be a minimum Grade G90 electro-galvanized with a minimum of 0.9 oz of zinc per square foot.
- B. The wall brackets used to attach the framing to the existing structural components shall be formed from sheet steel a minimum of 0.0750" thick. Each bracket shall have a minimum of two (2) slots for self drill screws that anchor the bracket to the substrate, and one (1) threaded hole which, at a minimum, is indented and threaded to double the thickness of the metal at the opening; thereby lengthening the engagement of the threads on M8 (8 mm) hex socket screws that shall be used to affix the vertical 'L' track.
- C. The bracket dimensions shall be appropriate to the offset from the wall; with 2" offset brackets a minimum of 3¼" high, and/or 4" & 6" offset brackets at least 4¾" high where they attach to the substrate. Each bracket shall allow for the installation of insulation equal in thickness to the offset where insulation is specified in the design. Brackets may be utilized to align differing wall profiles or accommodate architectural features.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

- D. The vertical 'L' track which attaches to the wall brackets shall be formed from steel a minimum of 0.0475" thick. The nominal dimensions shall be 2" on the side which attaches to the wall bracket and 1¼" along the face. Elongated slots, spaced ~ 4" on center, shall be incorporated along the entire length of the track to allow for truing or plumbing of the vertical framing (regardless of the condition of the substrate) prior to the installation of the horizontal track. The horizontal track shall be attached via M8 hex socket screws in regularly spaced, threaded holes in the 'L' track that are indented to double the thickness of the metal at the opening in the same manner as for the wall bracket.
- E. The horizontal 'U' track shall be formed from steel nominally 0.0475" thick, with a base dimension of ~ 1" and sides 1.2" high. This track shall have regular openings along the base to allow for drainage and regularly spaced slots @ 2" on center along the back to facilitate the M8 screw attachment to the vertical track. These attachment slots shall be accessible through larger openings in the front of the track to facilitate insertion of the screws.

#### 2.03 THIN BRICK MASONRY PANELS

- A. The unit masonry panels shall be comprised of thin brick units approximately 1 ¼ x 3 3/8 x ¾ inches, mounted on a pressed steel frame via a polymer modified cementitious joint mortar.
- B. The thin brick shall comply with ASTM C 1088 'Thin Veneer Brick Units Made from Clay or Shale'.
1. Suppliers: Endicott Clay, Pacific Clay Products, or approved equal
  2. Colors: Dark Ironspot, Desert Sands, or as selected by architect
- C. The pressed steel panel backing shall be Grade G90 electro-galvanized with a minimum of 0.9 oz of zinc per square foot. The sheet steel used for the backing shall be a minimum of 0.30" thick and shall feature rows of punched and raised clips that positively engage the horizontal 'U' track. There shall be a row of clips every 4" and each row shall have a minimum of four clips. These shall be staggered to accommodate a "zipper" edge along each side that allows for positive interlock of adjacent panels. The nominal size of the raised clips shall be 6" long by 1" high, with shortened clips permitted at the "zipper". The panel shall feature perforations along all mortar joints that allow for the penetration and "keying" of the mortar.
- D. The polymer modified cementitious joint mortar shall be comprised of Portland Cement (Type I or II), Hydrated Lime (Type S), Aggregates (meeting ASTM C 144), and proprietary polymer admixtures. The mortar shall be tested in accordance with ASTM C 1439 and achieve a minimum compressive strength of 2500 psi @ 28 days.
1. The color of the mortar shall be selected by the architect from the manufacturers approved pallet.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

- E. The face of all mortar joints shall be covered with micro-stone (stone granules) with > 90% of the aggregate passing a #20 (850 micron) sieve.
  - 1. The micro-stone shall match in color the mortar selected.
- F. The panels shall be assembled in a production facility certified by the manufacturer.
- G. Typical panel size as manufactured shall be approximately 24" x 48" x 1". The approximate panel weight shall be 8.2 lbs/sq. ft.

#### 2.04 PANEL HARDWARE

- A. Zinc coated steel self drill 3/16 x 3/4" hex head screws shall be used to attach adjacent panels along the exposed perimeter of the steel backing per manufacturers installation instructions.
- B. Seismic Rivets shall be :
  - a. W&E P/N 25-2122: FORD-OE 385323-S100/CHRYSLER-OE 6031091 Super Split "Glass Stop" Rivet 1/4" diameter - .257/.261 hole required, Grip range .520 - .590 or,
  - b. W&E P/N 25-2622: 20184399, 389268-S100, Window Regulator Rivet, 1/4" diameter, 1/2" flange, .68 - .75 grip range, aluminum/steel.

#### 2.05 MORTAR FOR FIELD GROUTING OF PANEL JOINTS

- A. All joints, where the panels overlap, shall be field grouted with the identical polymer modified cementitious joint mortar as used in the manufacture of the panels.
  - 1. The mortar for field grouting shall contain fibers to reinforce the mortar in vertical application.
  - 2. The mortar shall match the color selected for the manufactured panels.
- C. The face of the joints shall be covered with micro-stone conforming to the requirements for the panel and shall match the selected color of the mortar.

#### 2.06 MISCELLANEOUS

- A. All expansion joints along the vertical 'zipper' joints or continuous bed joints shall be sealed with a sealant approved by the manufacturer.
- B. Zinc coated steel self drill hex head screws, a minimum of 1/4 x 2", shall be used to attach the framing to a metal stud substructure.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

1. Similar attachments designed by the EOR and incorporated in the shop drawings shall be employed to attach the framing to other substructures; such as wood, masonry, concrete, etc.
2. Washers, caulk, or other approved methods shall be employed to insure the envelope integrity at each point of attachment.

#### 2.07 METAL SUPPORTED UNIT MASONRY SYSTEM PROVIDERS

- A. STONEL™ Thin Brick Curtainwall System, by Stonel Inc, 5190 Neil Road, Suite 430, Reno, NV 89502, (866) 487-0953 (Manufacturing facility: 28308 N. Cedar Road, Deer Park, WA 99006, Tel: (509) 262-0104), including Stofix® mounting system; or approved equal.

### PART 3 – EXECUTION

#### 3.01 PREPARATION

##### A. General:

1. Evaluate the initial plumb of the walls of the structure.
2. Verify wall bracket spacing and framing clearances relative to studs or other points of attachment.
3. All architectural details, and mechanical and electrical requirements, shall be verified in the field prior to the commencement of the installation

#### 3.02 INSTALLATION

##### A. COLD FORMED METAL FRAMING

1. Use a laser or chalk line to mark the starting height (~20” above grade) of the curtain-wall.
2. Mount the starting height wall brackets at 16 or 24” on center (as determined by the EOR) using a minimum of 2 screws per bracket.
3. Simultaneously install the vertical ‘L’ track and wall brackets (at intervals determined by the EOR) to the height of the curtain-wall.
  - a. Check plumb of vertical track both parallel and perpendicular to the structure. Use slots in track to insure parallel alignment of face of framing.
  - b. Tighten all M8 hex socket screws that attach the vertical track to the wall brackets to 125 in/lbs of torque. If installed using hand tools, verify for each installer at beginning of project using snug tight criteria.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

4. Where vertical obstructions are present and unavoidable (i.e. window openings), use laser or chalk line to restart vertical 'L' track; ensuring horizontal alignment of screw holes for horizontal 'U' track.
5. Install all specified insulation in the spaces between the 'L' track prior to the installation of the horizontal 'U' mounting track.
6. Mount the lowest (first) horizontal 'U' track to the lowest holes in the vertical 'L' track using M8 screws. Install the next 'U' track 500 mm (~20") above. Tighten to between 90-100 in/lbs of torque. Verify equivalent snug tight condition for installers using hand tools.
7. Install all successive horizontal 'U' tracks at 600 mm (~23 3/8") intervals.
8. When encountering windows and other openings, the horizontal 'U' track shall be mounted so that the fastening points are as close to the lower and upper edges of the windows and other openings as possible.
9. A horizontal 'U' track shall be installed for the top and bottom edges of all panels less than 20' wide. In regions of jarring or excessive vibration, 'U' track at 12" intervals is recommended. Where the panel backing has been cut, prohibiting normal overlap conditions, additional 'U' track shall be installed. All atypical conditions shall be analyzed and appropriate framing components installed.

#### B. THIN BRICK PANELS

1. As is the case for the framing, the installation of the panels begins at the bottom of the wall.
2. The lowest (first) panel is hung on the 2 lowest horizontal 'U' tracks, by the lower and uppermost row of clips on the panel backing.
3. The staging of the installation should generally proceed from left to right, with all atypical situations planned out in advance.
4. It is imperative that all panel backing clips along the row (or rows) used for hanging the panel engage the front of the horizontal 'U' track.
  - a. It may be necessary to bend outward the clips along the rows used for hanging the panels, as palletizing and shipping may have unintentionally bent these straight; prohibiting positive engagement with the track.
  - b. The leading edge of the clip should be between 1/4" & 3/8" (~6 to 9.5 mm) from the back of the brick.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

- c. Do not over-bend the clips outward, as this will also weaken the panel to framing attachment.
  - d. Excessive mortar fins formed during the keying of the mortar may also interfere with positive engagement. Any mortar protruding more than ~ 3/32" (2.5 mm) from the panel backing in regions adjacent to the engagement clips shall be removed.
  - e. As panel backing engagement cannot be easily observed during installation, all efforts must be made to ensure full engagement of the appropriate clips with the track.
5. With the exception of atypical conditions, all panels above the lowest row are hung only from the top row of clips.
  6. Overlap each adjacent panel; top over bottom, right over left.
  7. Attach panels at overlap using 3/16 x 3/4 " hex head screws (snug tight) approximately 12" on center; along all horizontal and vertical joints.
  8. Do not allow screws to engage the framing. The linked panels are not meant to be mechanically attached to the framing members.
  9. At a frequency to be determined by the EOR, drill a hole slightly larger than the Seismic Rivet diameter at locations where the rivet will pass through the opening in the front of the horizontal 'U' track. Engage the rivet. Cut off the rivet shank flush with the rivet head so it is completely encapsulated with the vertical grout.

#### C. MORTAR JOINT GROUT

1. Install mortar joint grout provided by the manufacturer at overlap where panel backing is exposed, except at designated expansion joints.
2. Mix polymer modified mortar in an approved mixer using ~ 114 oz of water per bag (approximately 2.3 oz/lb)
3. Do not prepare quantities in excess of the amount that can be installed over a period of 1.5 hrs. Do not re-temper. Discard unused mortar after 1.5 hours.
4. Install mortar using a grout bag or other approved methods.
5. Do not pre-wet panels.
6. Do not install material that is overly wet or dry.
7. Install micro-stone as the topcoat of the mortar before the mortar has set.

## SECTION 04 2513

### METAL SUPPORTED UNIT MASONRY PANELS GUIDE SPECIFICATION

---

8. **Observe all environmental limitations for installation (i.e. less than 40 degrees or greater than 100 degrees F).**

#### **D. EXPANSION JOINT SEALANT**

1. **Install approved expansion joint sealant in all expansion joints.**
2. **Install micro-stone as the topcoat of the sealant before the mortar has set.**
3. **Observe all environmental limitations for installation.**

#### **3.03 TOLERANCES**

- A. **Install the system components in accordance with tolerances specified by the manufacturer.**

#### **3.04 QUALITY CONTROL**

- A. **Prior to the installation of the panels, perform a visual survey of the wall brackets and vertical 'L' and horizontal 'U' track. Spot check torque on M8 hex socket screws and plumb of the framing members.**
- B. **Verify and document procedure for bending panel backing clips prior to installation and perform spot checks during installation.**
- C. **Survey panel to panel screw installation prior to field grouting of the joints.**
  - a. **Provide periodic inspections of the mixing and installation of the mortar joint grout. Prepare and test representative samples per ASTM C109. Make a minimum of three sample batches of the mortar during the installation of the material. As directed by the EOR, sample panels shall be taken for laboratory evaluation.**

#### **3.05 CLEAN UP**

- A. **At the end of each day's work, insure that no materials, tools, or debris will interfere with other work onsite.**
- B. **Upon completion of the installation, remove all associated debris, scraps and refuse.**

**END OF SECTION**