Guide Specification

SECTION 07480
Prefabricated Exterior Wall Assemblies

This guide specification includes a prefabricated exterior wall assembly, constructed with primary components, in panels of horizontal or vertical profile, including connection devices for attachment to the building’s structural framing system, and usually pre-finished with an exterior cladding material.

Related products and assemblies such as windows, doors, firestopping, air barriers, vapor retarders, insulation and sealants normally specified in other sections can be referenced from this section or, when appropriate, included by adding detailed statements.

Prefabricated exterior wall assemblies can be constructed using a wide variety of materials, finishes, accessories, panel and joint configurations, and installation methods. They can also be constructed as structural back-up and/or substrates for the on-site application of various cladding materials including brick veneer. This section provides a basic outline for a comprehensive system.

This section includes performance, proprietary and descriptive type specifications. Edit to avoid conflicting statements.

PART I - GENERAL

1.01 SECTION INCLUDES

A. Prefabricated panels for exterior wall assemblies constructed with:
   1. Galvanized or painted, cold-formed, lightweight steel framing.
   2. Miscellaneous hot-rolled structural framing (if required).
   3. Exterior grade substrates compatible with selected finish material.
   4. Adhesives, appliances or attachments, necessary to receive finish materials. Includes control joints, wire ties for brick veneer, etc.
   5. Exterior cladding materials including, but not limited to, EIFS, stone, thin brick, ceramic tile, and stucco.
   6. Provision (e.g., blocking) for attachment of gutter/downspout systems, flashing or other constructions as required.
   7. Clip angles, shim, slide connections, bracing and other items required for panel erection and installation.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

List sections which specify installation of products specified in this section and indicate specific items.

1.03 RELATED SECTIONS

A. Section 04100 - Mortar and Masonry Grout
B. Section 04150 - Masonry Accessories
C. Section 04200 - Unit Masonry
D. Section 04400 - Stone
E. Section 04700 - Simulated Masonry
F. Section 05100 - Structural Metal Framing
G. Section 05300 - Metal Decking
H. Section 05400 - Cold-Formed Metal Stud Systems
I. Section 05500 - Metal Fabrications
J. Section 06100 - Rough Carpentry
K. Section 07190 - Vapor Retarders
L. Section 07195 - Air Barriers
M. Section 07210 - Building Insulation
N. Section 07240 - Exterior Insulation and Finish Systems
O. Section 07270 - Firestopping
P. Section 07600 - Flashing and Sheet Metal
Q. Section 07900 - Joint Sealers
R. Section 08100 - Metal Doors and Frames
S. Section 08500 - Metal Windows
T. Section 09200 - Lath and Plaster
U. Section 09250 - Gypsum Board
V. Section 09300 - Tile
W. Section 10200 - Louvers and Vents

1.04 REFERENCES

A. American Iron and Steel Institute (AISI) - Specifications for Design of Cold Formed Steel Structural Members, 1986.
B. American Plywood Association (APA) - Design/Construction Guide.
C. ANSI/ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
E. ASTM C79 - Gypsum Sheathing Board.
F. ASTM C955 - Load-Bearing (Transverse and Axial) Steel Studs, Runners (Track), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
G. ASTM C1007 - Installation of Load-Bearing (Transverse and Axial) Steel Studs and Related Accessories.
H. ASTM C1063 - Installation of Lathing and Furring for Portland Cement-Based Plaster.
K. ASTM E413 - Classification for Determination of Sound Transmission Class.
M. American Welding Society (AWS) - D1.3-89 Structural Welding Code - Sheet Steel.
O. Metal Lath/Steel Framing Association (ML/SFA) - Lightweight Steel Framing Systems Manual.

1.05 SYSTEM DESCRIPTION

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Describe components used to assemble the system. Do not repeat statements made in Article 1.01 - SECTION INCLUDES.
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A. System: Prefabricated exterior wall assembly panel system of [horizontal] (and) [vertical] [___________] profile, finished with [EIFS] [ceramic tile] [thin brick] [stucco] [___________] exterior cladding materials, with specified accessories and components, for installation on, and attachment to, the [concrete] [steel] structural frame of the building.

1.06 DESIGN AND PERFORMANCE REQUIREMENTS

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Use this article to identify system design requirements only. Delete paragraphs not appropriate to the project.

Performance specifying permits manufacturer the latitude to adjust design to achieve specified requirements. Rely on this article as the base for wall panel system specifying and minimize statement so not to conflict with performance criteria.

This section is usually performance specified but may also be used when specifying a particular manufacturer’s product.

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A. Design and size panels and connections to withstand dead and live loads resulting from positive and negative wind pressure acting normal to the plane of the wall to a design wind load of [_____] lb/sq ft ([_____] KPa) as measured in accordance with ANSI/ASTM E330 in accordance with the 19[J edition of the [_____] code, basic wind speed [_____] , exposure condition [_____] in seismic zone [0] [1] [2] [3] [4].

B. The maximum allowable deflection of the panel shall be L/[_____] based on the capacity of the lightweight cold-formed steel framing system alone, as coordinated with the various building envelope components.

C. System to accommodate, without damage to the system, components or seals: movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; a maximum L/[_____] deflection of structural support framing [___], a maximum of [_____] inches ([___] mm) shortening of building concrete structural columns [___], a maximum [_____] inches ([_____] mm) creep of concrete structural members [___] and a mid-span slab edge deflection of [_____] inches ([_____] mm).

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Use following Paragraph D to identify location of tolerances for the constructed structural framing elements (e.g. columns, spandrel beams, etc.) If industry standards are cited, provide complete information on title, edition and source.

Research the interface of structural framing and prefabricated exterior wall assembly tolerances to assure compatibility. Industry standards for most structural systems are excessive for attachment of prefabricated exterior wall assemblies unless special adjustment devices are incorporated in the connections.

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D. System to accommodate building structural framing tolerances [as specified in Section [_____] of this project specification] [as published in [_____] standard, 19[_____] edition, by [______]].

E. Technical data, performance requirements and selection of component materials and products to meet stated design criteria are the responsibility of the panel manufacturer.

F. Products and materials of this section shall provide continuity of thermal barrier at building enclosure elements [in conjunction with thermal insulating materials in Section [______]] as detailed in the contract documents.

G. Accommodate positive drainage for moisture entering, or condensation occurring within the panel system, to the exterior.

H. Products and materials of this Section shall provide continuity of vapor retarder and air barrier at building enclosure elements [in conjunction with vapor retarder materials in Section [07190] [_____] and air barrier materials in Section [07195] [______]] as detailed in the contract documents.

1.07 SUBMITTALS

A. Submit in accordance with Section 01300.

B. Shop Drawings:
   1. Panel manufacturers shall submit, for approval by the architect and/or engineer, a complete set of shop drawings including:
      a. Type and designation of members.
      b. Accessory items.
      c. Connection details complete with weld and/or mechanical fastener information.
      d. Installation diagrams (elevation and plan).
      e. Size, gage and spacing of framing members.
      f. Relationship of framing to surrounding finish materials.
      g. Structural calculations when required.

C. Product Data
   1. Written description and/or catalog cuts describing each component of the system. Include technical data to substantiate compliance with specifications.

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When manufacturer’s instructions for specific installation requirements are referenced in PART 3 - EXECUTION, include the following request for submittal of those instructions. Edit the PART 3 statements to avoid conflict with manufacturer’s instructions.

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D. Manufacturer’s Installation Instructions: Indicate special handling criteria, installation sequence, cleaning procedures and [__________].

1.08 QUALITY ASSURANCE

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Utilize this article for referencing industry association recommendations for detailing and fabrication procedures when such procedures are appropriate for the project.
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A. Perform Work in accordance with [AISI] [AWS] [ML/SFA] [______].

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Include the following paragraph only when the cost of acquiring the specified standards is justified.
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1.09 QUALIFICATIONS

A. Manufacturer shall have a minimum of [three] [____ ] years [documented] experience with completed projects of like size and make-up.
B. Installer shall [have a minimum of [three] [____ ] years [documented] experience] [and] [be approved by the manufacturer] with completed projects of like size and make-up.

1.10 MOCK-UP

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Use this article for review of construction, coordination of Work of several sections, testing, or observation of operation.
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A. Provide mock-up of wall panel system under provisions of Section [____________].
   1. Construct a sample panel at the manufacturing site using materials and techniques proposed for panel manufacture.
   2. Mock-up shall illustrate component assembly including panel materials and perimeter sealant.
   3. Mock-up size shall not exceed [______________].

B. This mock-up panel, once approved, shall serve as the standard by which all future panels will be judged.
C. Mock-up may [not] remain as part of the Work.

1.11 PRE-INSTALLATION CONFERENCE

A. Prior to manufacture, the panel manufacturer shall attend a pre-installation conference with the related trades to coordinate material interfaces, manufacturing/installation tolerances and protection of installed panels.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle panels and related components under provisions of Section [_______ ] and in accordance with the following requirements.
B. Packing and Shipping
   1. Panels shall be packaged and loaded in a manner which prevents damage during transit.
   2. Deliver panels to site in a sequence which assures installation continuity.
C. Storage and Protection
   1. Store panels on-site when practical, at a location where directed. If unable to store on-site, store at off-site staging area or at the manufacturing plant.
2. Store panels off ground, under cover, protected from weather and construction activities.
3. Store and handle to insure against distortion, racking, bending, twisting, abrasion, discoloration, staining or any other physical damage.

1.13 COORDINATION

A. Coordinate the Work of this section closely with all related sections and under the provision of Section [__________], with particular care that:
   1. Joint sealants shall be applied in a timely manner after installation of panels and/or installation of windows.
   2. Flashing, sills, copings and other related construction shall be completed in a timely manner after panel installation.

1.14 WARRANTY

A. Panel manufacturers shall warranty workmanship for a period of one year.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

In this article, list the manufacturers acceptable for this project. If product substitution is allowed, include Paragraph B.

A. Acceptable panel manufacturers.
   1. [__________]
   2. [__________]
   3. [__________]

B. All substitutions shall be in accordance with Section 01630, Product Options and Substitutions.

2.02 COMPONENTS

A. Cold-Formed Metal Framing
   1. Framing shall meet the requirements of Section [______] - Cold-Formed Metal Stud Systems.
   2. Framing shall be sized in sections and gages as required to meet the design conditions.

B. Substrate Sheathing
   1. Substrate sheathing shall meet the requirements of Section [__________].

   1. The following products and manufacturers are acceptable:
      a. [__________] manufactured by [__________].
      b. [__________] manufactured by [__________].
      c. [__________] manufactured by [__________].
      d. All substitutions shall be in accordance with Section 01630, Product Options and Substitutions.
   2. Install in the largest size possible to minimize joints.

In the following section, specify the exterior sheathing material that is compatible with the specified finish cladding material or system. Provide complete information and source if trade-named products are desired.
C. Finish Cladding Material
   1. The finish cladding material shall meet the requirements of Section [______].

   ******************OR******************

   1. The following products and manufacturers are acceptable:
      a. [______] manufactured by [__________].
      b. [______] manufactured by [__________].
      c. [______] manufactured by [__________].
      d. All substitutions shall be in accordance with Section 01630, Product Options and Substitutions.

   2. Panel manufacturer shall be a trained system applicator as certified by the cladding material manufacturer.

2.03 ACCESSORIES

A. Provide all required accessory items including but not limited to:
   1. Bracing and reinforcing to ensure against panel racking.
   2. Lifting devices to facilitate picking the panels up during handling and erection.
   3. Vertical slide clips and/or slide connections which provide for building movement and deflection, if required.
   4. Steel or wood blocking which must be fabricated within the panel for attachment of flashing, parapet caps, window washing equipment, tie-offs, etc.
   5. Flashing which must be incorporated into the panel.
   6. Miscellaneous angles, clips, braces, or other appliances necessary to meet required wind and shear loads.

2.04 FABRICATION

A. Assemble components into complete pre-fabricated panels in accordance with approved shop drawings.
   1. All welds shall be touched up with zinc-rich coating.
   2. Welds shall conform to AWS standards.
   3. Where splicing of track is necessary between stud spacing, a piece of stud not less than 12 inches long shall be placed in the track, centered over the splice, and attached with two welds per flange to each piece of track.

B. Tolerance of framing
   1. Vertical alignment (plumbness) of studs shall be within L/960 (1/8 inch in 10 feet 0 inches) of the span.
   2. Horizontal alignment (levelness) of the studs shall be within L/960 (1/8 inch in 10 feet 0 inches) of their respective length.
   3. Spacing of studs shall not exceed +/-1/8 inch (3 mm) from the designed spacing, provided the cumulative amount does not exceed the requirements of the finishing materials.

C. Tolerance of substrate sheathing surface.
   1. The plane of the substrate sheathing surface shall be within the tolerances required for the finish cladding material.

D. Tolerance of finish cladding material.
   1. Thickness and/or other installation requirements shall be within the tolerances of the finish cladding material.

E. Tolerance of completed panel.
   1. Height and width of panel.....+l/4 inch, - 1/8 inch
   2. Thickness ..................+1/4 inch, - 1/8 inch (measured at the interface where the stud seats in the track)
   3. Squareness ...............maximum 1/8 inch difference in diagonals per 10 ft of diagonal length.

2.05 SOURCE QUALITY CONTROL

A. Inspection
   1. In-plant manufacturing shall be subject to controlled inspections if requested. Cost and payment of controlled inspections shall be in accordance with Section [______].
   2. Provide internal quality control through periodic manufacturing inspection. Spot check various phases of panel assembly to insure strict adherence to design.
   3. Finish cladding manufacturer shall provide periodic in-plant inspection to verify proper installation method. Inspection report sheets shall be maintained on file at the panel manufacturing site and in the finish cladding manufacturer’s office.
   4. As required by local building code.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive prefabricated panel system for deviations from the contract documents. Provide immediate written notification in the event of any deviations.

B. Do not begin installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Layout
1. Check field measurements from axis lines and benchmarks provided by others.
2. Establish references for panel installation.
   a. Panel joints. (horizontal and vertical)
   b. Elevation plumbness.

B. Protection
1. Protect surrounding areas and surfaces to prevent damage during installation of prefabricated panels.
2. Advise owners of possible damage from water penetration to back of exposed panel.

Surface Preparation
1. Install all apparatus and appliances necessary to receive completed panels.

3.03 INSTALLATION

A. Install panels in strict accordance with installation drawing.

B. Panels shall be securely welded or bolted to the structure in strict accordance with the engineered design.

C. Installation tolerances.
1. Dimension between panels at outside face of panels . . +/− 3/16 inch
2. Joint taper (panel edges not parallel)
   Per lineal foot of joints . . . 1/40 inch
   Maximum per panel length . . . 3/8 inch
3. Panel alignment
   Alignment of horizontal and vertical joints . . . ¼ inch
   Offset in exterior face of adjacent panels . . . ¼ inch
4. Location of openings in wall panels . . . +/- ¼ inch

3.04 FIELD QUALITY CONTROL

A. Inspection
1. Panel installer shall be subject to the inspection of the panel manufacturer, architect and/or owner.

3.05 PROTECTION

A. The panel manufacturer shall be responsible for the protection of panels in accordance with Section 1.12 until the time of erection and shall not be responsible for subsequent damage caused by panel installer or others.

B. The panel installer shall be responsible for protection of panels during installation until securely attached to the building structural system. Panel installer shall not be responsible for subsequent damage caused by others.

END OF SECTION