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**SPECIFICATION**

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**SECTION 07 42 13.16**

**ALUMINUM plate WALL PANELS (AP400)**

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This guide specification has been prepared by Lumabuilt, in printed and electronic media, as an aid to specifiers in preparing written construction documents for the AP400 metal plate wall panel system.

Edit entire master to suit project requirements. Modify or add items as necessary. Delete items which are not applicable. Words and sentences within brackets [\_red\_] reflect a choice to be made regarding inclusion or exclusion of a particular item or statement. This section may include performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements. Editor notes to guide the specifier are included between lines of asterisks to assist in choices to be made. Remove these notes before final printing of specification.

This guide specification is written around the Construction Specifications Institute (CSI), Section Format standards references to section names and numbers are based on MasterFormat 2020.

Lumabuilt reserves the right to modify these guide specifications at any time. Updates to this guide specification will be posted to the manufacturer=s web site and/or in printed matter as they occur. Lumabuilt makes no expressed or implied warranties regarding content, errors, or omissions in the information presented.

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1. **GENERAL**
   * + 1. SUMMARY
          1. Section includes metal plate wall panels used for exterior wall cladding, parapets, fascia and soffits as the siding component of a drained back-ventilated rain screen system.
       2. PREINSTALLATION MEETINGS
          1. Preinstallation Conference: Conduct conference at Project site.

Meet with Contractor, Architect, metal plate installer, structural‑support Installer, and installers whose work interfaces with or affects metal composite material panels, including installers of doors, windows, and louvers.

Equipment and facilities needed to make progress and avoid delays.

Review methods and procedures related to metal panel installation, including manufacturer's written instructions.

Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.

Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.

Review temporary protection requirements for metal panel assembly during and after installation.

Review procedures for repair of metal panels damaged after installation.

Document proceedings, including corrective measures and actions required, and furnish a copy of record to each participant.

* + - 1. ACTION SUBMITTALS
         1. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

* + - * 1. Shop Drawings:

Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.

Accessories: Include details of the flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

Delegated Design: Provide shop drawings signed and sealed by a structural engineer licensed to practice in the location of the project, indicating ability of system and attachment to supporting construction to resist code required loads.

* + - * 1. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

Include similar Samples of trim and accessories involving color selection.

* + - * 1. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

Color chips: 3 inches (76 mm) wide by 5 inches (127 mm) long.

Profile verification sample: 12 inches (305 mm) by 12 inches (305 mm) Include fasteners, closures, and other metal panel accessories.

* + - 1. INFORMATIONAL SUBMITTALS
         1. Sample Warranties: For special warranties.
         2. Submit sustainability documentation for recycled content and other pertinent attributes in support of project’s sustainability goals.
      2. CLOSEOUT SUBMITTALS
         1. Maintenance Data: For metal panels to include in maintenance manuals.
      3. QUALITY ASSURANCE
         1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.
         2. [Mockups]: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

Build mockup of typical metal panel assembly as shown on Drawings, including corner, supports, attachments, and accessories.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
         2. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
         3. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
      2. FIELD CONDITIONS
         1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.
      3. COORDINATION
         1. Coordinate the dry-in prior to metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
      4. WARRANTY
         1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including rupturing, cracking, or puncturing.

Deterioration of metals and other materials beyond normal weathering.

Buckling not associated with the substrate and/or structure to which the metal panel system is attached. Defined as 1/16" out of plane per linear foot.

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In B2 below, a 20-year warranty is available at additional cost.

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1. Warranty on Cladding Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal cladding that show evidence of deterioration of factory-applied finishes within specified warranty period. Warranty terms and conditions, found in Lumabuilt warranty, apply.
   1. [Solid Color Finish] Deterioration includes, but is not limited to, the following:
      1. Color Retention: Color fading more than 7 units from the original color, when tested in accordance with ASTM D2244.
      2. Gloss Retention: Finish will exhibit gloss retention of a minimum of 50% of the original gloss when measured in accordance to ASTM D523 at a 60° angle.
      3. Chalking Resistance: Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214 Test Method A.
      4. Checking and Cracking: Will not visibly check or crack in such a way as to significantly adversely affect the appearance of the surface.
      5. Finish Warranty Period: 20 years.
   2. [Sublimated Finish Standard] Deterioration includes, but is not limited to, the following:
      1. Color Retention: Color fading more than 5 units from the original color, when tested in accordance with ASTM D2244.
      2. Gloss Retention: The coated surface will exhibit gloss retention to a minimum of 30% from the original gloss.
      3. Chalking Resistance: Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
      4. Checking and Cracking: There will be no clearly visible checking or cracking of the painted finish on the products installed on the building.
      5. Paint Adhesion: Adhesion of Painted Finish when initially applied to test panels and measured by reference to AAMA 2604-02; Clause 7.4.2 will show no evidence of film removal.
      6. Finish Warranty Period: Standard 15 years.
   3. [Sublimated Finish Optional] Deterioration includes, but is not limited to, the following:
      1. Color Retention: Color fading more than 5 units from the original color, when tested in accordance with ASTM D2244.
      2. Gloss Retention: The coated surface will exhibit gloss retention to a minimum of 30% from the original gloss.
      3. Chalking Resistance: Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
      4. Checking and Cracking: There will be no clearly visible checking or cracking of the painted finish on the products installed on the building.
      5. Paint Adhesion: Adhesion of Painted Finish when initially applied to test panels and measured by reference to AAMA 2604-02; Clause 7.4.2 will show no evidence of film removal.
      6. Finish Warranty Period: [Enhanced 20 years] [AAMA 2604 10-year or AAMA 2605 20-year, American Standard]
2. **PRODUCTS**
   * + 1. PERFORMANCE REQUIREMENTS
          1. Structural Performance: Provide metal cladding systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E330:

Wind Loads: As indicated on Drawings or as required to meet applicable building codes.

Deflection Limits: For wind loads, no greater than l/180 of the span.

* + - * 1. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

* + - * 1. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings from an applicable testing agency.

Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

* + - 1. METAL PLATE WALL PANELS
         1. Metal Plate Wall Panels: Provide factory-formed, metal plate wall panels fabricated from single sheets of metal formed into profile for installation method indicated. Include attachment assembly components, panel stiffeners, and accessories required for drained back-ventilated system.

Acceptable Manufacturer and Product: Lumabuilt AP400; [www.lumabuilt.com](http://www.lumabuilt.com)

Substitutions: Submit in accordance with Section 01 60 00

* + - * 1. System depth 1-7/8 inch
        2. Aluminum Sheet: Tension-leveled, smooth aluminum sheet, ASTM B209 (ASTM B209M), alloy varies depending on finish.

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In D below, select plate thickness.

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   * + - 1. Aluminum thickness: [0.080 inch (2.03 mm)] [0.090 inch (2.29 mm)] [0.100 inch (2.54 mm)] [0.125 inch (3.18 mm)]
         2. Attachment Assembly: Manufacturer's standard concealed clips on sub-girt framing system.
       1. MISCELLANEOUS MATERIALS
          1. Miscellaneous Metal Sub framing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
          2. Panel Accessories: Provide components required for a complete panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
          3. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, end walls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels unless otherwise indicated.
          4. Panel Fasteners: Self-tapping screws designed to withstand design loads.
          5. Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal flashing, trims or penetrations where a weather tight seal is required; Provide sealant types that are compatible with panel materials, are nonstaining, and do not damage panel finish.
       2. FABRICATION
          1. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
          2. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Sealed Joints: Form no expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.

Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

* + - * 1. Panel Configuration: Custom shaped; fabricated with formed welded corners; open vertical joints; closed horizontal joints; and weep holes, drainage channels, & back ventilated.
        2. Custom fabricate panels from solid plate with an integrated drainage channel.
        3. Aluminum frame clips to be pre-attached to panels by manufacturer.
        4. Aluminum stiffeners shall be pre-attached to the panel assembly at 24-inches on center to assure flatness or as required by design calculations to assure conformance with specified wind loads.
        5. Panels shall have a flatness criteria not to exceed 0.1875” within 24” in any direction.
        6. Normal dimensional tolerances on length and width of +/- 0.023” up to 48” (+/- 0.064” over 48”) and +/- 0.1875” diagonal
      1. FINISHES
         1. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are acceptable and typical.

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In B below, select desired panel color, and if wood grained, the preferred pattern.

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   * + - 1. Aluminum Panels and Accessories:

1. Pretreatment: Chrome Free five stage aluminum pretreatment system. Complies with AAMA 2603 AAMA 2604 and AAMA 2605 Superior Performance Standard and meets EPA, OSHA, State and Local environmental requirements and contains no chromates, cyanides or other heavy metals. Waste treatment is usually a simple pH neutralization and disposal to the sanitary sewer.

[Select finish] Remove if not applicable.

a)[Wood Grains]: Premium wood finishes using a polyurethane powder coat with ink-based wood grain patterns sublimated into the base powder. The combined effect creates all the aesthetic aspects of real wood.

b) [Solid Colors]: Premium finishes using a polyurethane powder coat available in smooth or fine textured finish.

c) [Specialty Finishes]: Premium finishes using a polyurethane powder coat with ink-based patterns sublimated into the base powder. The combined effect creates all the aesthetic aspects of finishes such as weathered steel, concrete, stone, marble, and other offerings.

2. Contact Lumabuilt for available wood grains, solid color options, and texture finishes.

1. **EXECUTION**
   * + 1. EXAMINATION
          1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

Examine framing to verify that girts, angles, channels, studs, and other structural cladding support members and anchorage have been installed within alignment tolerances of 1/4” within 20 feet, as required by metal cladding manufacturer.

Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

* + - * 1. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
        2. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION
         1. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.
      2. INSTALLATION
         1. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

Shim or otherwise plumb substrates receiving metal panels.

Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.

Install screw fasteners in predrilled holes.

Locate and space fastenings in uniform vertical and horizontal alignment.

Install flashing and trim as metal panel work proceeds.

Align bottoms of metal panels and fasten with self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

* + - * 1. Fasteners:

Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

* + - * 1. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
        2. Attachment Assembly, General: Install attachment assembly required to support metal plate wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel system joint seals.

* + - * 1. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended in writing by metal panel manufacturer.

* + - * 1. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.

Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (605 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

* + - 1. ERECTION TOLERANCES
         1. Installation Tolerances: Shim and align metal plate wall panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
      2. CLEANING AND PROTECTION
         1. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
         2. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
         3. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION 07 42 13.16**