SECTION  – metal plate wall panels

1. General
   1. SUMMARY
      1. Provide Work described in this Section and all ancillary components required for a complete installation. This includes but is not limited to the following:
         1. Aluminum plate wall panels
         2. Aluminum plate soffit panels
         3. Related trims, extrusions, and miscellaneous framing, flashings, end caps and closures.
      2. Related Requirements:
         1. Section 04 20 00 – Unit Masonry.
         2. Section 05 40 00 – Cold-Formed Metal Framing.
         3. Section 05 50 00 – Metal Fabrications.
         4. Section 06 10 00 – Rough Carpentry.
         5. Section 07 21 13 – Board Insulation.
         6. Section 07 26 00 "Vapour Retarders"
         7. Section 07 27 15 – Non-bituminous Self-Adhering Sheet Air Barriers.
         8. Section 07 42 13.19 – Insulated Metal Wall Panels.
         9. Section 07 54 19 – Polyvinyl-Chloride (PVC) Roofing.
         10. Section 07 62 00 – Sheet Metal Flashing and Trim.
         11. Section 07 92 00 – Joint Sealants.
         12. Section 08 11 13 – Hollow Metal Doors and Frames.
         13. Section 08 41 13 – Aluminum-Framed Entrances and Storefronts.
         14. Section 08 44 13 – Glazed Aluminum Curtain Walls.
         15. Section 09 29 00 – Gypsum Board.
   2. reference standards
      1. American Architectural Manufacturers Association (AAMA)
         1. AAMA 508-05, Voluntary Test Method, and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
         2. AAMA 620-02, Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates.
      2. American National Standards Institute (ANSI)
         1. ANSI H35.1-2009, Standard Alloy and Temper Designation Systems for Aluminum.
      3. American Society for Testing of Materials (ASTM)
         1. ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
         2. ASTM B209-10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
      4. Canadian General Standards Board (CGSB):
         1. CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.
      5. Underwriters Laboratories of Canada (ULC):
         1. CAN/ULC S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
         2. CAN/ULC S134-13, Standard Method of Fire Test of Exterior Wall Assemblies.
   3. preinstallation meetings
      1. Preinstallation Conference: Conduct conference at Project site.
         1. Meet with Owner, Consultant, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
         2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
         3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
         4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
         5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
         6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
         7. Review temporary protection requirements for metal panel assembly during and after installation.
         8. Review procedures for repair of metal panels damaged after installation.
         9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
   4. action SUBMITTALS
      1. Product Data: For each type of product.
         1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
      2. Shop Drawings:
         1. 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.
         2. 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).
         3. Related items shown on shop drawings which are not intended to be supplied as part of the work of this section, shall be so identified. All dimensions shall be clearly noted and methods of fastening and anchoring detailed. Show accurately and identify all adjacent materials.
         4. Shop drawings shall bear the seal and signature of a professional Engineer registered in the place of the Work and experienced in the design and fabrication methods used.
         5. Do no fabrication work until shop drawings are reviewed and accepted by the Consultant.
      3. Design Calculations
         1. Submit design calculations bearing the seal and signature of the professional Engineer who stamped the shop drawings.
         2. Design calculations shall include all test reports and other pertinent supporting data.
         3. Submit design calculations at the same time as shop drawings.

Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + 1. Samples for Initial Selection: For each type of metal panel indicated with factory-applied colour finishes.
       1. Include similar Samples of trim and accessories involving colour selection.
    2. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
       1. Metal Panels: 12 inches (305 mm) long by actual panel width.
       2. Submit one (1) sample of clips, caps, fasteners, closures, and other exposed panel accessories used in final panel assembly.
  1. informational submittals

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 01 45 00 – Quality Control and as may be supplemented in "Quality Assurance" Article.

* + 1. Qualification Data: For Installer.
    2. Product Test Reports: For each product, tests performed by a qualified testing agency.
       1. Metal Wall and Soffit Panels: Include reports for air infiltration, water penetration, thermal performance, fire-test-response characteristics, and structural performance.
       2. Insulation and Vapour Retarders: Include reports for thermal resistance, fire-test-response characteristics, water-vapour transmission, and water absorption.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + 1. Field quality-control reports.
    2. Sample Warranties: For special warranties.
  1. closeout submittals
     1. Maintenance Data: For metal panels to include in maintenance manuals.
  2. quality assurance
     1. Installer Qualifications: Ensure work of this Section is executed by installers specializing in type of Work specified herein, having training and certification from Product manufacturer, and with a minimum five (5) year record of successful performance.
        1. Installer's responsibilities include fabricating and installing metal wall panel assemblies and providing professional engineering services needed to assume engineering responsibility.
        2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified Professional Engineer.
     2. Fabricator Qualifications: Ensure fabricators are certified by metal wall panel manufacturer to fabricate and install manufacturer's wall panel system.
     3. Source Limitations: Obtain each type of metal wall panel through one source from a single manufacturer.
     4. Mock-ups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

Retain first subparagraph below for large-scale mock-up. Indicate portion of building represented by mock-up on Drawings or draw mock-up as separate element. Revise to suit Project or if larger mock-up is needed for field performance testing.

* + - 1. Build mockup of typical corner wall panel, including soffit, as shown on Drawings; approximately 48 inches (1220 mm) square by full thickness, including a "four-way" joint for metal-plate wall panels, insulation, supports, attachments, and accessories.
      2. Water-Spray Test: Conduct water-spray test of mockup of metal panel assembly, testing for water penetration according to AAMA 501.2.
      3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Consultant specifically approves such deviations in writing.
      4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
    1. Professional Engineer Qualifications: Retain the services of a professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated to design portions of the Work requiring structural performance and to review and stamp Shop Drawings.
       1. Shop Drawings shall bear the stamp of a Professional Engineer as specified in this Section.
  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.
     4. Retain strippable protective covering on metal panels during installation.
  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.
     2. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.
  3. coordination
     1. Coordinate 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

When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

* + 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.
       1. Failures include, but are not limited to, the following:
          1. Structural failures including rupturing, cracking, or puncturing.
          2. Deterioration of metals and other materials beyond normal weathering.

Verify available warranties and warranty periods for metal panels.

* + - 1. Warranty Period: Five (5) years from date of Substantial Completion.
    1. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

Usually retain "Exposed Panel Finish" Subparagraph below for fluoropolymer finishes; verify availability with manufacturer.

* + - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
         1. Colour fading more than 5 Hunter units when tested according to ASTM D 2244.
         2. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
         3. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
      2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

1. Products

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Section 01 61 00 – Common Product Requirements.

* 1. performance requirements
     1. Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
     2. Fire Resistance: Where required by building type, classification, occupancy, height or building size, Provide cladding system tested in accordance with CAN/ULC S134 by an independent testing organization, and approved for use in non-combustible construction.
     3. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at 75 Pa (1.56 psf) pressure differential.
     4. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
        1. Static Water Penetration: No water penetration when tested in accordance with ASTM E331 at inward static pressure differential of not less than 300 Pa (6.24 psf) positive static air pressure difference for a 15-minute duration, with a water application rate of 5 gal/ft2/hr.
        2. Dynamic Water Penetration: No uncontrolled water penetration when tested in accordance with AAMA 501 at dynamic pressure differential of not less than 300 Pa (6.24 psf) for a 15-minute duration, with water application rate of 5 gal/ft2/hr.
        3. Water leakage does not include water controlled by flashing and gutters that is drained to exterior without damage to adjacent materials or finishes.
     5. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330:
        1. Design cladding to accommodate thermal movement caused by ambient temperature range in accordance with National Building Code of Canada requirements and to suit Project location, without causing noise, buckling, failure of joint sealants, undue stress on metal members and fasteners, of operating units, reduction of performance, and other detrimental effects.
        2. Design cladding support system in accordance with CAN/CSA S136 for Design of Cold Formed Steel Structural Members.
        3. Wind loads: In accordance with requirements indicated on Structural Drawings.
        4. Deflection Limits: Engineer metal wall panel assemblies to withstand test pressures with deflection no greater than 1/180 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.2 percent of the clear span.
           1. Test Pressures: 150 percent of inward and outward wind-load design pressures.
     6. Seismic Performance: Design materials specified in this Section to withstand the effects of earthquake motions determined according to National Building Code of Canada requirements. Professional engineer referenced in this Section shall be responsible for designing systems and submitting signed and sealed analysis data and Shop Drawings illustrating seismic-resistant systems. Refer to Structural Drawings for seismic sensitivity values.
     7. Thermal Movements: Provide metal wall panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
        1. Temperature Change (Range): 67 deg C (120 deg F), ambient; 100 deg C (180 deg F), material surfaces.
  2. METAL PLATE WALL PANELS <Insert drawing designation>
     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, and accessories required for complete system.

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed. Retain option and delete insert note if manufacturer's name and model number are indicated on Drawings.

* + - 1. Basis-of-Design Product: Subject to compliance with requirements, and as established by the Basis-of-Design Materials, manufacturers offering products that may be incorporated into the Work include but are not limited to, the following:
         1. Sobotec; "SL-2000P Dry Joint System"
    1. Fasteners: Concealed.
    2. Surface: Smooth, flat finish.
    3. Aluminum Sheet: Tension-leveled, smooth aluminum sheet, ASTM B 209 (ASTM B 209M), 0.125 inch (3.18 mm) thick.
       1. Exterior Finish: [Two-coat fluoropolymer] [Three-coat fluoropolymer] [Mica fluoropolymer] [Metallic fluoropolymer] [FEVE fluoropolymer] [Clear anodized] [Colour anodized].
          1. Colour: [As indicated by manufacturer's designations] [Match Consultant's samples] [As selected by Consultant from manufacturer's full range] <Insert colour>.

See the Metal Plate Wall Panels Table in the Evaluations to determine support type in "Attachment Assembly" Paragraph below for specific products. Coordinate with "Installation" Article.

* + 1. Attachment Assembly: [Manufacturer's standard] [Clip] [Subgirt and spline].
  1. miscellaneous materials
     1. Miscellaneous Metal Sub-framing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, 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.
        1. Steel Sheet Components, General: Complying with ASTM C 645 requirements for metal and with ASTM A 653/A 653M, G90, hot-dip galvanized zinc coating.
        2. Sub-Girts, Z-bars: Sheet steel conforming to ASTM A653/A653M, Grade A Zinc coating to Z275 (G90) designation, formed from minimum 1.219 mm (18 ga) base thickness.
        3. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
        4. Flashings: Panel design to include for corners, jambs and abutments. Flashings will not be permitted at these locations.
        5. Sill flashings to be of matching gauge and finish as panels complete with reinforce back up splice plates at joints and directional changes.
     2. Panel Accessories: Provide components required for a complete, weathertight 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.
     4. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching colour of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
     5. Panel Sealants: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer. Provide sealant types that are compatible with panel materials, are nonstaining, and do not damage panel finish.
     6. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
  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. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
     3. 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.
        1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
        2. Seams for Aluminum: Fabricate non-moving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
        3. Seams for Other Than Aluminum: Fabricate non-moving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
        4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
        5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
        6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
           1. 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.
  3. finishes
     1. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
     2. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
     3. Aluminum Panels and Accessories:

Retain one fluoropolymer or anodized finish from subparagraphs below. Verify availability of finishes for products specified. If retaining more than one, indicate location of each on Drawings or by inserts. To obtain a proprietary finish system, insert names of coating manufacturers and products.

Revise or insert additional testing requirements in five fluoropolymer subparagraphs below if performance levels indicated in AAMA 2605 are insufficient. See Evaluations.

* + - 1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in colour coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      2. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both colour coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      3. Mica Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in colour coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      4. Metallic Fluoropolymer: AAMA 2605. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both colour coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      5. FEVE Fluoropolymer: AAMA 2605. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in colour coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      6. Exposed Anodized Finish:

Retain one of two options in "Clear Anodic Finish" Subparagraph below. Class I finish is heavy anodized. Verify availability with manufacturers.

* + - * 1. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker.

Retain one of two options in "Colour Anodic Finish" Subparagraph below. Verify availability with manufacturers.

* + - * 1. Colour Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm] or thicker.

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.

Retain one or both subparagraphs below.

* + - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
      2. 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.

Retain subparagraph below with subparagraph above for systems that depend on air- or water-resistive barriers to prevent air infiltration or water penetration.

* + - * 1. 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 sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 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.
        1. Shim or otherwise plumb substrates receiving metal panels.
        2. 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.
        3. Install screw fasteners in predrilled holes.
        4. Locate and space fastenings in uniform vertical and horizontal alignment.
        5. Install flashing and trim as metal panel work proceeds.
        6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
        7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
        8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
     2. Fasteners:
        1. 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.
     3. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
     4. 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.
        1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
     5. Clip Installation: Attach panel clips to supports at locations, spacings, and with fasteners recommended by manufacturer. Attach flanges of metal plate wall panels to panel clips with fasteners, as recommended by manufacturer.
        1. Seal horizontal and vertical joints between adjacent metal plate wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
        2. Seal horizontal and vertical joints between adjacent metal plate wall panels with manufacturer's standard gaskets.
     6. Subgirt-and-Spline Installation: Install support assembly at locations, spacings, and with fasteners recommended by manufacturer. Use manufacturer's standard sub-girts and splines that provide support and complete secondary drainage assembly, draining to the exterior at horizontal joints. Attach metal plate wall panels by interlocking perimeter extrusions attached to panels with sub-girts and splines. Fully engage integral sub-girt-and-spline gaskets and leave horizontal and vertical joints with open reveal. Terminate edge of panels flush with perimeter extrusions.
        1. Install metal plate wall panels to allow individual panels to be installed and removed without disturbing adjacent panels.
        2. Do not apply sealants to joints unless otherwise indicated.
     7. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
        1. 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.
     8. 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.
        1. 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.
        2. 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).
  3. 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.
  4. field quality control

Retain "Testing Agency" Paragraph below to identify who shall perform tests and inspections. If retaining second option, retain "Field quality-control reports" Paragraph in "Informational Submittals" Article.

* + 1. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

Retain "Water-Spray Test" Paragraph below to check system's resistance to water penetration. Revise indicated test-area requirements to suit Project.

* + 1. Water-Spray Test: After installation, test area of assembly as directed by Consultant for water penetration according to AAMA 501.2.
    2. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
    3. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
    4. Prepare test and inspection reports.
  1. 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 touch-up or similar minor repair procedures.

END OF SECTION