

SECTION 07 42 13

FORMED METAL WALL PANELS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

1.2

- A. The drawings and provisions of the General Conditions, Supplementary Conditions and the sections included under Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section includes machine formed metal wall panels used as the exterior or interior cladding.
 - 1. Air barriers related to the work of this section (specified under 07 27 00)
 - 2. Insulation related to the work of this section (07 21 13)
 - 3. Supporting sub-girts.
 - 4. Cladding profile.
 - 5. Accessories including associated flashings, closures, sealants.

1.3 STANDARDS

- A. Work of this section shall conform to the following standards, as applicable:
 - 1. CSA-S136 for the design of Cold Formed Steel Structural Members
 - 2. Canadian Sheet Steel Building Institute Standards 20M.
 - 3. National Building Code of Canada
 - 4. RCABC Roofing Practices Manual, current edition
 - 5. SMACNA manual, current edition

1.4 PERFORMANCE REQUIREMENTS

- A. Structural performance: provide exterior/interior wall cladding assemblies capable of withstanding the effects of load and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components.
 - 1. Dead load: As required by applicable building code.
 - 2. Live Load: As required by applicable building code.

3. Wind Load: Uniform pressure (velocity pressure) of (Insert Design Criteria) lb/sq ft. (Insert Design Criteria), acting inward or outward.
 4. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum changes (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components and other detrimental effects:
 - a. Temperature Change (range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Joints and panel lengths shall be designed to allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.
 - C. Manufacturing, installation, and sealing shall prevent excessive deformation of exposed surfaces.
 - D. Design panel system to accommodate substructure tolerance of +0 to -1/8 inch: 10'.
 - E. Not Permitted: Vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building elements; loosening, weakening or fracturing of attachments or components of system.
 - F. Preformed metal panel system to withstand code imposed design loads.
 - G. Rainscreen performance in compliance with AAMA 508-07

1.5 SUBMITTALS

- A. Product Data: Manufacturer's product literature for the panel specified.
- B. Shop Drawings: For exterior/interior wall panel assemblies and accessories. Include plans; elevations; sections and details.
- C. Structural Calculations: Submit a comprehensive analysis of design loads, including dead loads, live loads, wind loads and thermal movement prior to tender closing
- D. Quality Assurance Submittals: Submit the following:
 1. Certificates: Product certificates signed by manufacturer certifying materials comply with the specified performance characteristics and criteria, and physical requirements.
 2. Shop Drawings: Shop drawings sealed by a Professional Engineer registered in the province of British Columbia certifying the seismic and structural loading requirements of the panel system. Include related Schedules as required by local regulation.
- E. Samples for initial selections

- F. Thermal Performance letter from a Qualified Professional Engineer engaged to ensure the effective R-Value of the wall system meets specified project requirements
- G. Samples for verification: Provide material samples. Samples shall involve normal color and texture variations, include sample sets showing the full range of variations expected.
- H. Affidavit certifying that the material meets the requirements specified.

1.6 QUALITY ASSURANCE

- A. Manufacturing, installation, and design of the panel system shall be reviewed by a professional engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of kind indicated. Letters of Assurance and Schedule SB and SC are required – engineering specific to the project specific profile(s) to be completed prior to project tender date and prior to the expiration of the alternate acceptance period.
- B. Manufacturer Qualifications: Minimum of 10 years of experience in manufacturing exterior wall panels similar to those specified.
- C. Installer Qualifications: Acceptable to manufacturer.

1.7 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions, and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 1. Store materials in accordance with manufacturer's recommendations.
 - 2. Handle materials carefully to avoid damage to materials and finishes.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual supporting and adjoining construction by field measurements before fabrication, and indicate recorded measurements on final shop drawings. Coordinate construction to ensure that wall panel assemblies fit properly to supporting and adjoining construction and coordinate schedule with construction progress to avoid delaying the work.
 - 1. Established dimensions: where field measurements can not be made without delaying the work, guarantee dimensions and proceed with fabrication of wall panel assemblies corresponding to the established dimensions.

1.9 WARRANTY

- A. Project warranty refers to Conditions of the Contract for project warranty provisions. Manufacturer's warranty: submit, for Owner's acceptance, manufacturer's standard warranty documents executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under Contract Documents.
- B. The Contractor shall warrant the materials to be free of faults and defects in accordance with the General Conditions, except that the warranty shall be extended by paint manufacturer's standard multi-year warranty. The warranty shall be in writing and shall be signed by the manufacturer.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers: Subject to compliance with requirements, provide products manufactured by:
 - a. LKMe Products Ltd. #310 – 197 Forrester Street, North Vancouver, BC, www.lkme.com
 - b. LKMe Custom Series – Twin-Bend Brake Formed Long-length high performance cladding
 - c. Alternate systems by other manufacturers/fabricators are to be submitted to the architect not less than 7 working days prior to tender closing. Submissions are to include engineering calculations and sectional analysis of project specific panel profiles, 2' minimum length panel samples, available finish samples and sectional analysis of panel profile(s) completed by a professional engineer.

2.2 MATERIALS

- A. Aluminum Extrusions where required: ASTM B221, alloy 6063-T6 and/or 6061-T6
- B. Sub-girts shall be fabricated from a minimum of 18ga. AZM 150 galvanized steel – sized to suit project requirements

- C. Sub-girt clips shall be LKMe “Brak” clip, fabricated from minimum 18ga. Stainless steel. Clips to be sized and spaced to suit project wind and seismic load requirements and to attain project required thermal performance standards
Panels shall be fabricated from 22 ga. AZM 150 Core PVDF Coated galvanized steel. Color to be **custom colour as selected by Architect**. Panels to be formed as shown on drawings
- D. Flashing Materials shall be fabricated from a minimum of 24ga PVDF coated galvanized steel (AZM 150) – color to match base wall panels
- E. Panel Finishes:
1. Coating shall be a fluoropolymer coating utilizing 70% Kynar 500 resins.
 2. Color to be custom color as selected by owner/consultant
 3. Coating shall be factory applied on a continuous process paint line. Coating shall consist of a 0.2 mil prime coat, a 0.75 mil barrier coat, a 0.75 mil metallic/color coat containing 70% Kynar resins, and a 0.5 mil clear coat containing 70% Kynar resins (Note mil thickness is approximate.)
 4. Pencil Hardness – ASTM D3363
 5. Shall be HB-H minimum
 6. Impact Adhesion – ASTM D2794-93
 7. Coating shall show no cracking and no loss of adhesion
 8. Humidity Resistance – ASTM D2247 - Coating shall show no blisters after 2000 hours of 100% humidity at 95°F.
 9. Salt Spray Resistance – ASTM B117 - After 1000 hours of exposure to 5% salt fog, at 95°F, scored sample shall show none or few #8 blisters, and less than 1/8" average creepage from scribe
 10. Weatherometer Test – ASTM D882-86/G23-88 Coating shall show no cracking, peeling, blistering, or loss of adhesion after 2000 hours.
 11. Chalking Resistance – ASTM D659-86
 12. No chalking greater than #8 after 10 years Florida exposure at 45°S.
 13. Color Change – ASTM D2244-74
 14. Color change shall not exceed 5 NBS units after 10 years Florida exposure at 45°S.
 15. Abrasion Resistance – ASTM D968-93

2.3 FABRICATION, GENERAL

- A. Composition - Metal Sheet shall be brake formed in a Twin-bend Brake to reduce or eliminate differential stress in the sheet and to minimize handling. Profiles shall be as shown on drawings, and be fabricated from minimum 22 ga. AZ 150 Galvanized steel with PVDF coating

Note: Roll forming or press brake forming is not permitted.

- B. Tolerances
1. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.
 2. Panel lines, breaks and curves shall be sharp, smooth and free from unnecessary warps or buckles.
- C. Panel surfaces shall be free of scratches or marks caused during fabrication.
- D. Ensure that entire project is manufactured from single coil run to ensure uniformity.
- E. If a directional (metallic) color is selected panel grain direction is maintained. Under no circumstances are panel blank sizes to be rotated even if material waste is increased (unless otherwise specified).
- F. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting, weeping and draining.

2.4 ACCESSORIES

- A. All exposed rivets/fasteners shall be stainless steel.
- B. All hidden fasteners shall have DT2000 corrosion resistant coating or be stainless steel to suit engineering requirements.
- C. Flashing: AZM 150 PVDF coated steel to match wall panels where exposed; secured with concealed fastening method wherever practicable.
- D. Panel System Subgirts: Provide AZM150 galvanized steel of minimum 18 ga. and spacing required for panel system structural requirements, as recommended by panel manufacture and in accordance with approved shop drawings. To avoid galvanic reaction, separate dissimilar metals.
- E. Panel System Clips: Provide LKMe "Brak" clips of 18ga. Stainless Steel at spacing and locations as recommended by the panel supplier, and in accordance with engineered and approved shop drawings. Shop drawings to include letter from a qualified engineer asserting the effective R-Value of the assembly.
- F. All proprietary extrusions and flashings supplied by panel fabricator.
- G. No exposed sealant to be used at panel-to-panel connections.

2.5 FINISHES, GENERAL

- A. To be PVDF or FEVE factory coil coated finish system, or:
 - B. Natural, or Galvalume finish
- (* Note: see copy and paste section for basic material properties)

2.6 PROFILE NUMBER

- A. LKMe # _____ as specified by the architect. No alternate or substitute profiles are acceptable.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation. Panel substructure shall be level and plumb. Panel substructure shall be structurally sound as determined by that subcontractor's engineer. Panel substructure shall be free of defects detrimental to work and erected in accordance with established building tolerances. Coordinate delivery of such items to project site.

3.2 INSTALLATION

- A. Erect panels level and plumb, in proper alignment in relation to substructure framing and established lines.
- B. Panels shall be erected in accordance with approved shop drawings.
- C. Panel anchorage shall be structurally sound and per engineering recommendations.
- D. Where aluminum materials come in contact with dissimilar materials, an isolation shim or tape shall be installed at fastening locations.
- E. Locate and place wall panels' level, plumb, and at indicated alignment with adjacent work.

3.3 CLEANING AND PROTECTING

- A. Clean exposed surfaces of wall panels that are not protected by temporary covering to remove fingerprints and soil during construction period.
- B. Clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Protect wall panel assemblies from damage during construction. Use temporary protective coverings where needed as approved by the wall panel manufacturer.

- D. Clean and touch up minor abrasions in finished with air-dried coating that matches color and gloss, and is compatible with, factory-applied finish coating.

END OF SECTION

COPY AND PASTE SECTION

STEEL AND ALUMINUM Finishes

16. Panel Finishes:
17. Coating shall be a fluoropolymer coating utilizing 70% Kynar 500 resins.
18. Color as selected by owner/consultant from manufacturer's standard colors.
19. Coating shall be factory applied on a continuous process paint line. Coating shall consist of a 0.2 mil prime coat, a 0.75 mil barrier coat, a 0.75 mil metallic/color coat containing 70% Kynar resins, and a 0.5 mil clear coat containing 70% Kynar resins (Note mil thickness is approximate.)
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21. Shall be HB-H minimum
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1. Coating shall show no cracking and no loss of adhesion
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27. No chalking greater than #8 after 10 years Florida exposure at 45°S.
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30. Abrasion Resistance – ASTM D968-93

STAINLESS STEEL FINISHES

- A. Stainless steel plate: alloy and temper as recommended by manufacturer for application and in compliance with manufacturers performance requirements.
 - 1. Stainless steel material: [type 304] or [type 316].
 - 2. Thickness: [18 gage] or [22 gage].
 - 3. Finish: TBD

ZINC

- A. Zinc Alloy Sheet/Coils:
 - 1. Titanium Zinc Alloy whose base is electrolytic high grade fine zinc (DIN EN1179) with a 99.995 % Zn degree of purity and alloying additives of 1% copper and 1% titanium in accordance with DIN EN 988.
 - a. Bright and Shiny
 - b. Pre-Weathered: pickling process (no phosphating)
 - 1. Blue-Gray
 - 2. Graphite Gray
 - c. Pre-Weathered Pro-Roofing: backside coated with elastomeric finish as manufactured by PPG Industries
 - 2. Minimum Panel Thickness: 1.5 mm
 - 3. Minimum Flashing Thickness: 0.7 mm
 - 4. Provide custom copings and related sheet metal work fabricated from zinc alloy sheet. Humidity Resistance – ASTM D2247