

3. Finish: Galvanized per ASTM A653/A653M, G90.
- D. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.

2.05 PANEL FINISH

- A. MBCI Galvalum Plus



2.06 ACCESSORIES AND MISCELLANEOUS ITEMS

- A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
 1. Downspouts: Open face, profileper details.
- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.
- C. Sealants:
 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
 3. Seam Sealant: Factory-applied, non-skinning, non-drying type.
- D. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.
 1. Type: Woven polypropylene with anti-slip polyolefin coating on both sides.
 2. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
 3. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
 4. Flammability: Minimum of Class A, when tested in accordance with ASTM E108.
 5. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
 6. Water Vapor Permeance: Vapor retarder; maximum of 1 perm (57.2 ng/(Pa s sq m)), when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
 7. Performance: Meet or exceed requirements for ASTM D226/D226M, Type II asphalt-saturated organic felt.
 8. Liquid Water Transmission: Passes ASTM D4869/D4869M.
 9. Functional Temperature Range: Minus 70 degrees F (56.7 C) to 212 degrees F (100 C).
 10. Fasteners: As specified by manufacturer and building code qualification report or approval, if any.
 11. Products:
 - a. System Components Corporation, Inc.; ProTex: www.systemcomponents.net.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.07 FABRICATION

- A. Panels: Fabricate panels and accessory items at factory, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.
- B. Joints: Factory-install captive gaskets, sealants, or separator strips at panel joints to provide weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.




PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide FW-120 Formed Metal Wall Panel manufactured by MBCI or equal.
- B. Other Acceptable Manufacturers:
 - 1. Centria; www.centria.com.
 - 2. Petersen Aluminum Corporation; www.pac-clad.com.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURED METAL PANELS

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide exterior panels and soffit panels.
 - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Design Pressure: In accordance with applicable codes.
 - 4. Maximum Allowable Deflection of Panel: 1/90 of span.
 - 5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 - 6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
 - 7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
 - 8. Corners: Factory-fabricated in one continuous piece with minimum 18 inch (450 mm) returns.
 - 9. Provide continuity of air barrier and vapor retarder seal at building enclosure elements in conjunction with materials specified in Section 07 2500.
 - 10. **Panel Finishes:**
 - 11. Exterior Finish: MBCI Galvalum Plus 
 - 12. Exterior Panel Back Coating: Manufacturer's standard siliconized polyester wash coat.
- B. Exterior Panels:
 - 1. Profile: Vertical; style as indicated.
 - 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets.
 - 3. Material: Precoated aluminum sheet, 20 gage, 0.032 inch (0.81 mm) minimum thickness.
 - 4. Panel Width: 12 inches.
 - 5. Color: As selected by Architect from manufacturer's standard line.
- C. Soffit Panels:
 - 1. Profile: Style as indicated.
 - 2. Material: Precoated aluminum sheet, 20 gage, 0.032 inch (0.81 mm) minimum thickness.
 - 3. Color: As selected by Architect from manufacturer's standard line.
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
 - 1. Provide mitered internal corners, back braced with 18 gage, thick precoated metal sheet to maintain continuity of profile.
- E. Expansion Joints: Same material, thickness and finish as exterior sheets; 18 gage; manufacturer's standard brake formed type, of profile to suit system.
- F. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- G. Anchors: Galvanized steel.

4. Guardian Industries Corp: www.sunguardglass.com.
 5. Pilkington North America Inc: www.pilkington.com/na.
 6. PPG Industries, Inc: www.ppgideasclapes.com.
 7. Viracon, Apogee Enterprises, Inc: www.viracon.com.
 8. Substitutions: Refer to Section 01 6000 - Product Requirements.
- B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Metal Edge Spacers: Aluminum, bent and soldered corners.
 4. Spacer Color: Black.
 5. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 6. Color: Black.
 7. Purge interpane space with dry air, hermetically sealed.
 8. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet (762 m) between point of fabrication and point of installation to permit pressure equalization of air space.
 - a. Capillary Tubes: Tubes to remain open and be of length and material type in accordance with insulating glass fabricator's requirements.
 - b. Inert gas may be installed in the field into air space in accordance with insulating glass fabricator's and installer's requirements.

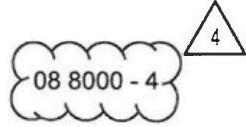
C. Type IG-5 - Insulating Glass Units: Safety glazing.

1. Applications:
 - a. Exterior windows.
 - b. Glazed sidelights and panels next to doors.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
2. Space between lites filled with air.
3. Glass Type: Fully tempered float glass for both outboard and inboard lites.
4. Total Thickness: 1 inch (25.4 mm).
5. Thermal Transmittance (U-Value), Summer - Center of Glassy .80, nominal.
6. Visible Light Transmittance (VLT): 70 percent, nominal.
7. Solar Heat Gain Coefficient (SHGC) .70 percent, maximum.
8. Visible Light Reflectance, Outside: 38 percent, nominal.
9. Glazing Method: Wet glazing method, sealant and sealant.
10. Low E Glass

2.05 GLAZING UNITS

A. Type G-5 - Monolithic Safety Glazing: Non-fire-rated.

1. Applications:
 - a. Glazed lites in doors, except fire doors.
 - b. Glazed sidelights to doors, except in fire-rated walls and partitions.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
 - d. Other locations indicated on the drawings.
2. Glass Type: Fully tempered safety glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch (6.4 mm), nominal.
5. SHGC .80 (Exterior doors only)
6. U Factor 1.2 (Exterior door only)



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SECTION 32 3116
ORNAMENTAL WELDED WIRE FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Welded wire mesh, modular fencing panels, including tubular steel posts and gates.
- B. Related sections:
 - 1. Section 03 30 00 - Cast-in-Place Concrete: Concrete footings for support of fence posts.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM A36 - Carbon Structural Steel.
 - 2. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 4. ASTM A526 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
 - 5. ASTM A792 - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 6. ASTM B117 - Operating Salt Spray (Fog) Apparatus.
 - 7. ASTM D822 - Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
 - 8. ASTM D2794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - 9. ASTM D3363 - Test Method for Film Hardness by Pencil Test.

1.03 SUBMITTALS

- A. Provide in accordance with Section 01 33 00 - Submittal Procedures:
 - 1. Product data for components and accessories.
 - 2. Shop drawings showing layout, dimensions, spacing of components, and anchorage and installation details.
 - 3. Sample: 8 by 10 inches minimum size sample of fence panel illustrating design, fabrication workmanship, and selected color coating.
 - 4. Copy of warranty specified in Paragraph 1.4 for review by Architect.

1.04 WARRANTY

- A. Provide in accordance with Section 01 7700 - Closeout Procedures:
 - 1. Factory finish: 20-year warranty against cracking, peeling, and blistering under normal use.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Ametco Manufacturing Corporation, 4326 Hamann Parkway, P.O. Box 1210, Willoughby, Ohio 44096; 800-362-1360.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 6000 - Product Requirements for procedures.

2.02 MATERIALS

- A. Wire: Galvanized steel wire.

- B. Steel bar stock: ASTM A36.
- C. Steel tubing: ASTM A500, Grade B.
- D. Steel sheet: ASTM A526 galvanized or ASTM A792 Galvalume.
- E. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing additives.

2.03 FENCE SYSTEM

- A. Type: Ornamental steel fencing system consisting of welded wire mesh modular fence panels, tubular steel posts, and strap-type panel fasteners and designed for basic- and medium-security applications; Fiesta Design as manufactured by Ametco Manufacturing Corporation.
- B. Fence panels: Fabricated from galvanized wire welded to form open mesh.
 - 1. Vertical wires: 3/16 inch diameter spaced at 2 inches.
 - 2. Horizontal wires: Two 1/4 inch diameter wires encasing vertical wires and spaced at 8 inches.
 - 3. Pickets: Form by extending vertical wires 1 inch above top horizontal wire.
 - 4. Size: 98-13/16 inches wide by 72 inches high.
 - 5. Panel fastener: K-shaped strap fastener, synthetic retainer, and safety screw to anchor panels to face of post.

2.04 POSTS

- A. Type: Steel tubes fabricated from ASTM A526 galvanized steel or ASTM A792 Galvalume steel as selected by manufacturer for type and size of fencing. [Provide post faced with vertical, V-shaped, recessed channels to receive wire edge of fence panel.]
- B. Size:
 - 1. Fence posts: 2 by 2 inches.
 - 2. Gate posts: 4 by 4 inches.
- C. Wall thickness: 12 gage.
- D. Length: 106 inches.
- E. Equip posts with plastic top caps.
- F. Factory drill posts to receive fence panel attachment fasteners.

2.05 GATES

- A. Type: Hinged swinging single gate.
- B. Construction: Welded frame fabricated from 2 by 2 inches steel tubing with welded wire panel to match fencing.
- C. Nominal size: 48 mm wide by 78 inches high.
- D. Hardware: Equip gates with manufacturer's standard hardware required for functional operation.
 - 1. Hinges: Size and type as determined by manufacturer. Provide 2 hinges for each leaf up to [6 feet] height and 1 additional hinge for each additional 24 inches in height or fraction thereof.
 - 2. Latch: [3/4 inch] slide bolt to accommodate padlock.
 - 3. For double gates provide padlockable, center cane bolt assembly and strike.

2.06 FACTORY FINISH

- A. Steel fence panels and posts shall be hot-dip galvanized to 1.25 ounces per square foot minimum zinc coating in accordance with ASTM A123 or provided with Galvalume coating complying with ASTM A792. Standard size components shall receive polyester powder coating. Large gate panels shall be coated with 2-part polyurethane coating.
- B. Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.
 - 1. Minimum hardness measured in accordance with ASTM D3363: 2H.

2. Direct impact resistance tested in accordance with ASTM D2794. Withstand 160 inch-pounds.
 3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than 3/16 inch undercutting.
 4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.
- C. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 180 degrees F and aged 14 days shall resist the following test conditions without failure:
1. 5 percent salt spray for 500 hours.
 2. 100 percent relative humidity for 1000 hours.
 3. Water immersion for 100 hours.
 4. 20 double rubs with cloth saturated with either lacquer thinner, acetone, MEK, gasoline, or xylene.
 5. Exposure to lubricating oils, hydraulic fluids, and cutting oils.
 6. 16 cycles of 24 hours at 100 percent humidity, 24 hours at 10 degrees F, and 24 hours at 77 degrees F.
 7. Hardness: H to 2H.
 8. Flexibility: 1/8 inch conical mandrel.
- D. Color: [Silver with weather-resistant clear coating] as manufactured by Ametco Manufacturing Company.] [Selected by Architect from manufacturer's standard range.] [Custom color as selected by Architect.]

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to fabrication, field verify required dimensions.
- B. Cast concrete footings in accordance with Section 03 30 00 - Cast-in-Place Concrete as detailed on Drawings and approved shop drawings.
 1. Minimum footing diameter:
 - a. Terminal and gate posts: 12 inches.
 - b. Intermediate line posts: 10 inches.
 2. Allow 12 inches minimum embedment of posts.
 3. Allow 8 inches minimum concrete beneath post bottom.
- C. Provide setting holes for embedment of fence posts.

3.02 INSTALLATION

- A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.
- B. Install fence posts plumb and level by setting post in hole cast in concrete. Temporarily brace fence posts with 2 by 4 wood supports until concrete is set.
- C. Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.
- D. Install fence panels to posts [prior to setting posts in footings].
 1. Secure wire fence panels with [fastener type as recommended by manufacturer.
 2. Space fasteners and secure to posts at spacing indicated on approved shop drawings.
 3. Attach channel-shaped connectors over joints between abutting horizontal bars.
- E. Install gates and adjust hardware for smooth operation. Provide concrete center foundation depth and drop rod retainers at center of double gate openings.

- F. Attach plastic caps to steel posts.
- G. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

END OF SECTION