SECTION 074213.16

ALUMINUM PLATE PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. ALUMINUM PLATE PANELS USED AS EXTERIOR OR INTERIOR CLADDING

1.2 RELATED SECTIONS

A. Division 05 “Cold Formed Metal Framing” as applicable

B. Division 07 “Thermal Insulation” as applicable

C. Division 07 “Fluid Applied Air Barriers” as applicable

1.3 REFERENCES

A. American Architectural Manufacturer’s Association (AAMA):

1. AAMA 501.1 – Standard test method for metal curtain walls for water penetration using dynamic pressure.

2. AAMA 508.07 – Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

3. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society of Civil Engineers (ASCE):

1. ASCE 7 – Minimum Design Loads for Builders and Other Structures.

C. ASTM International (ASTM):

1. ASTM B 117 – Standard Practice for Operating Salt Spray (fog) Apparatus.

2. ASTM C 481 – Standard Test Method for Cyclic Air Pressure for Laboratory Aging of Sandwich Constructions.

3. ASTM 1233 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights ad Curtain Wall by Cyclic Air Pressure Differential

4. ASTM D 1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

5. ASTM D 1781 – Standard Test Method for Climbing Drum Peel for Adhesives.

6. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color

Differences from Instrumentally Measured Color Coordinates.

7. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100 Percent Relative Humidity.

8. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

9. ASTM D 3350 – Standard Test Methods of Measuring Adhesion by Tape Test.

10. ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.

11. ASTM D 4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

12. ASTM E 72 – Standard Test Methods of Conducting Strength Tests Panels for Building Construction.

13. ASTM E 84 – Test Methods for Surface Burning Characteristics of Building Materials.

14. ASTM E 119 – Test Methods for Fire Tests of Building Construction and Materials.

15. ASTM E 283 – Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.

16. ASTM E 330 – Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

17. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference

D. Underwriters Laboratories, Inc. (UL):

1. UL 263 – Fire Resistance Tests of Building Construction and Materials.

2. UL 723 – Test for Surface Burning Characteristics of Building Materials.

3. UL Fire Resistance Directory.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of indicated loads and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components

a. Dead load: as required by applicable building code

b. Live load: as required by applicable building code

c. Wind load: Uniform pressure (velocity pressure) of (insert design criteria) lb/sq. ft. acting inward or outward

d. Thermal movement: provide assemblies that allow for thermal movement resulting from the following maximum changes (range) in ambient and surface temperatures by preventing buckling, opening of joints, over-stressing of components and other detrimental effects

i. Temperature change (range): 120 deg F, ambient; 180 deg F, material surfaces

ii. Joint shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.

iii. Panel system design to accommodate substructure tolerance of +0 to -1/8 inch

iv. Not permitted: vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building components; loosening, weakening or fracturing of attachments or components of system

v. Preformed metal panel system to withstand code imposed design loads. Maximum allowable deflection of span L/180

vi. Air infiltration; panel system shall not have air infiltration rate more than 0.12 cfm per sq. ft. of fixed wall area when tested in accordance with ASTM E283 at static air pressure differential of 1.57 psf

vii. Structural – Provide metal wall panel assemblies capable of withstanding the effects of indicated loads and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components as tested by ASTM E 330.

viii. Static Water Penetration: Panel system shall have no water penetration as defined by test method ASTM E331 at inward static pressure differential of not less than 6.24 psf positive static air pressure difference for a 15 minute duration with a water application rate of 5 gallon/ft²/hour.

ix. Dynamic Water Penetration: panel system shall have been tested in accordance with AAMA 501 and shall have passed with no uncontrolled water leakage at 15.0 psf dynamic pressure differential for a 15 minute duration with water application rate of 5 gallons/ft²/hour

x. Cyclic Air Pressure Differential: provide a panel system capable of pressure cycle testing in accordance with ASTM E1233. Testing shall consist of 100 cycles from 5 psf to 25 psf and system must pressure equalize in 0.08 seconds or less when tested as part of the AAMA 508-07 test protocol.

xi. Pressure Equalized Rainscreen Performance: provide a panel system designed to have no streaming water or droplets/mist on more than 5% of the cavity moisture barrier, when tested to AAMA 508-07 which include static and dynamic testing with imperfect air barriers.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of involved components and profiles, and finishes for each type of metal-faced plate panel and accessory.

B. Shop Drawings: Submit shop drawings detailing plan, elevation and section views as necessary to determine proper fabrication and installation methods. Coordinate locations with those found in contract drawings.

C. Selection Samples: For each finish product specified, submit color charts representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 4x6 inches, which represent the actual product, color, and patterns.

E. Engineering: Calculations supporting structural performance of the wall panels shall be prepared by a professional structural engineer.

F. Warranties: Samples of special warranties.

1.6 QUALITY ASSURANCE

A. System Fabricator Qualifications: All primary products specified in this section will be supplied by a single Fabricator with a minimum of ten (10) years' experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope specified.

C. Provide metal wall panels tested per ASTM E 84

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer of optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. The panel system manufacturer shall warrant that the system it supplies will be free from defects in materials and workmanship for a period of (2) years.

B. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 244.

b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

c. Cracking, checking, peeling or failure of paint to adhere to bare metal.

C. Finish Warranty Period: 10 years from date of Substantial Completion on 70% Kynar finish.

PART 2 PRODUCTS

2.1 SYSTEM FABRICATOR

Acceptable Fabricator: East Coast Metal Systems | P.O. Box 217 | 407 53rd Street | Bellaire, OH 43906 | Phone Number 740-676-2400

A. Aluminum Plate:

1. Manufacturers: Subject to compliance with requirements, provide products fabricated by East Coast Metal Systems, 407 – 53rd Street, Bellaire, Ohio 43906. (740) 676-2400

2.2 WALL PANEL MATERIAL

A. Aluminum Plate ASTM B209:

1. Plate Alloy: Aluminum 3003-H14/3105-H14 for painted finish. 5005-H34 for anodized finish

2. Thickness: [.090 based on pre-defined criteria], 0.125 inch [0.090 inch, 0.1875 inch]

B. Aluminum extrusions:

1. ASTM B221, alloy 6063-T6 and/or 6061-T6

2. Tolerances:

a. Panel Bow: Maximum 0.8 percent of any 1828mm (72inch) panel dimension.

b. Panel Flatness: Maximum deviation less than 1/8 inch (3mm) in 5 feet (1524mm) on Panel in any direction for assembled units.

2.3 WALL SYSTEM FABRICATION

A. System Type: EC-250 Dry Joint Aluminum Plate Pressure Equalized Rainscreen System, fabricated by East Coast Metal Systems, Inc.

1. Extruded horizontal and vertical tongue and groove extrusion system.

2. Reveal joint is open dry joint AAMA 508-07 tested,

3. Perimeter extrusions reinforce and encapsulate panel returns, eliminating any exposed cut edges.

4. Tolerances

a. Reinforce panels with stiffeners where applicable to meet design criteria

b. Surfaces shall be free from warp or buckle

2.4 FINISHES

A. Finish Type

1. Coating shall be spray applied fluorocarbon resin utilizing 70% Kynar 500 resins

2. Coats: Two (2) Coat Finish [3 Coat], [4 Coat]. Coating shall consist of a 0.2 mil prime coat, a 0.75 mil barrier coat [0.75 mil metallic/color coat] containing 70% Kynar resins [and a 0.5 mil clear coat containing 70% Kynar resins

3. Color: Custom color(s) to match samples contained in the Contract Documents,,

4. Relevant to the color selected, material to be painted in accordance with either AAMA 2605 or 2604.

5. Provide factory strippable plastic film for protection during fabrication, shipping and installation

6. Pencil HB-H minimum

7. Impact adhesion – ASTM D294-84

    a. Coating shall show no cracking and no loss of adhesion

8. Cure test – NCCA 11-18

    a. Coating shall withstand 50+ double rubs of MEK

9. Humidity resistance – ASTM D2247-87

    a. Coating shall show no blisters after 3000 hours of 100% humidity at 95° F

10. Salt Spray resistance - ASTM B117-85

    a. After 3000 hours of exposure to 5% salt fog at 95° F, scored sample shall show none or few #8 blisters and less than 1/8 inch average creepage

11. Weatherometer Test – ASTM D882-86/G23-88; coating shall show no cracking, peeling, blistering or loss of adhesion after 2000 hours

    a. Chalking resistance – ASTM D659-86

    b. No chalking greater than #8 after 10 years Florida exposure at 45’ S

    c. Color change – ASTM D2244-74

    d. Color change shall not exceed 5 NBS units after 10 years Florida exposure at 45’ S

    e. After 5000 hours in Atlas Weatherometer, coating shall show no objectionable chalking or color change

12. Abrasion resistance – ASTM D968-81; coating shall resist 65+/- 15 liters/mil minimum of falling sand

Note to Specifier: select paragraphs 13 <u>or</u> 14 below for anodized finish

13. Class I, Clear Anodic Finish: AA-M12C22A41 (mechanical finish; nonspecular as fabricated; chemical finish: etched, medium matte; Anodic coating: Architectural Class I clear coating 0.018 mm or thicker complying with AAMA 607.1

14. Class I Color Anodic Finish: AA-M12C22A42/A44 (Mechanical finish: nonspecular as fabricated; chemical finish: etched, medium matte; anodic coating: Class I integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.

a. Color as selected by architect from the full range of industry colors and color densities

b. Color: match architect's sample within allowable range per industry practice

2.5 FIELD MEASURING

A. Field verify all dimensions prior to fabrication

2.6 EXAMINATION

A. Do Not Begin installation until substrates have been properly prepared.

B. If Substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.7 PREPARATION

A. Clean surfaces using the methods recommended by the manufacturer for achieving the best results for the substrate under the project conditions.

2.8 INSTALLATION

A. Install in accordance with manufacturer's instructions.

2.9 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION