**Guide Specification:**

**SinoCore®**

**Citadel Architectural Products**

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SECTION 07 42 13 - METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

 A. Section Includes:

 1. Wall panel assembly consisting of:

 a. Exterior Cladding Panel

 b. Installation System

 c. Accessories

 2. The extent of the wall panel assembly as indicated in these specifications

 and in the drawings.

 B. Related Sections:

 1. Section 05 10 00 - Structural Metal Framing

 2. Section 06 10 00 - Rough Carpentry

 3. Section 07 20 00 - Thermal Protection

 4. Section 07 60 00 - Flashing And Sheet Metal

 5. Section 07 90 00 - Joint Protection

 6. Section 08 80 00 - Glazing

 7. Section 08 40 00 - Entrances, Storefronts, And Curtain Walls

 8. Section 08 50 00 - Windows

1.2 REFERENCES

 A. American Society For Testing And Materials (ASTM)

 1. ASTM B117 Standard Practice For Operating Salt Spray (Fog) Apparatus

 2. ASTM B137 Standard Test Method For Measurement Of Coating Mass Per Unit

 Area On Anodically Coated Aluminum

 3. ASTM B211 Standard Specification For Aluminum And Aluminum-Alloy Rolled

 Or Cold Finished Bar, Rod, And Wire

 4. ASTM B680 Standard Test Method For Seal Quality Of Anodic Coatings On

 Aluminum By Acid Dissolution

 5. ASTM C267 Standard Test Methods For Chemical Resistance Of Mortars, Grouts,

 And Monolithic Surfacings And Polymer Concretes

 6. ASTM C1371 Standard Test Method For Determination Of Emittance Of Materials

 Near Room Temperature Using Portable Emissometers

 7. ASTM D523 Standard Test Method For Specular Gloss

 8. ASTM D714 Standard Test Method For Evaluating Degree Of Blistering Of Paints

 9. ASTM D968 Standard Test Methods For Abrasion Resistance Of Organic Coatings

 By Falling Abrasive

 10. ASTM D1308 Standard Test Method For Effect Of Household Chemicals On Clear

 And Pigmented Organic Finishes

 11. ASTM D2244 Standard Practice For Calculation Of Color Tolerances And

 Color Differences From Instrumentally Measured Color Coordinates

 12. ASTM D2247 Standard Practice For Testing Water Resistance Of Coatings In 100%

 Relative Humidity

 13. ASTM D2248 Standard Practice For Detergent Resistance Of Organic Finishes

 14. ASTM D2794 Standard Test Method For Resistance Of Organic Coatings To The

 Effects Of Rapid Deformation (Impact)

 15. ASTM D3359 Standard Test Methods For Measuring Adhesion By Tape Test

 16. ASTM D3363 Standard Test Method For Film Hardness By Pencil Test

 17. ASTM D4145 Standard Test Method For Coating Flexibility Of Prepainted Sheet

 18. ASTM D4214 Standard Test Methods For Evaluating The Degree Of Chalking

 Of Exterior Paint Films

 19. ASTM E84 Standard Test Method For Surface Burning Characteristics

 Of Building Materials

 20. ASTM E903 Standard Test Method For Solar Absorptance, Reflectance And

 Transmittance Of Materials Using Integrated Spheres

 B. American Architectural Manufacturers Association (AAMA)

 1. AAMA 2605 Voluntary Specification, Performance Requirements And Test

 Procedures For Superior Performing Organic Coatings On

 Aluminum Extrusions And Panels

1.3 DEFINITIONS

 A. Leadership In Energy And Environmental Design (LEED):

 A set of guidelines set forth by the United States Green Building Council (USGBC)

 to promote the building of environmentally responsible and sustainable structures.

 B. ISO 9001:2008

 A set of guidelines set forth by the International Organization For Standardization (ISO)

 to provide guidance and tools for companies and organizations who want to ensure that

 their products and services consistently meet customer’s requirements, and that quality is

 consistently improved.

1.4 SYSTEM DESCRIPTION

 A. Design Requirements:

 1. Barrier System:

 Wall panel assembly shall be designed in accordance with manufacturer's guidelines

 to be sealed at all panel joints, intersections, dissimilar material abutments, and

 cutouts, thus providing a weathertight barrier system.

 2. Expansion And Contraction:

 Wall panel assembly shall be designed with provisions for thermal expansion and

 contraction of the component parts to prevent buckling, failure of joint seals,

 undue stress on fasteners or other detrimental effects due to accumulation

 of dead loads and various live loads.

 3. Windload:

 Wall panel assembly shall be designed to withstand a positive and negative windload pressure acting inward and outward normal to the plane of the wall to

 meet the requirements of the latest adopted Local Building Code.

 B. General Performance:

 Wall panel assembly shall comply with performance requirements,

 as determined by the following testing performed by a qualified agency.

1.5 SUBMITTALS

 A. Product Data:

 1. Submit manufacturer's datasheet for specified product.

 2. Submit manufacturer's installation guidelines for specified product.

 3. Submit manufacturer's literature indicating pre-consumer and

 post-consumer percentages of recycled content in the context of

 LEED MR Credit 4.1 and/or MR Credit 4.2.

 4. Submit manufacturer's literature indicating compliance with the

 American Recovery & Reinvestment Act (ARRA), Section 1605.

 B. Shop Drawings:

 Submit shop drawings indicating project layout and elevations, fastening and anchoring

 methods, dimensions of individual components and profiles, detail and location of joints,

 sealants and gaskets, flashing and accessories.

 C. Samples:

 1. Submit two (2) samples 3" x 5" of each product specified.

 2. Submit two (2) samples 3" x 5" of each finish specified.

 D. Test Reports:

 Submit test reports indicating compliance of products with specified performance

 requirements from an independent testing agency.

 E. Warranty:

 Submit manufacturer's warranty meeting the requirements of this section.

1.6 QUALITY ASSURANCE

 A. Qualifications:

 1. Manufacturer:

 Manufacturer shall have a minimum of ten (10) years experience

 in the manufacture of this product, shall be an ISO 9001:2008 Registered

 Company, and shall be located within the United States of America.

 2. Installer:

 Installer shall be experienced in performing work of this section and in

 work of similar scope required by this project.

 B. Pre-Installation Meeting:

 Conduct pre-installation meeting to verify project requirements, substrate conditions,

 manufacturer's installation instructions, and manufacturer's warranty requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

 A. Acceptance At Site:

 Materials to be packaged to protect against transportation damage. Examine materials

 upon receipt to insure that no damage has occured during shipment.

 B. Storage And Protection:

 1. Storage:

 Materials should be stored horizontally on pallets or platforms, covered with

 a suitable ventiliated and weathertight covering. Do not store materials where accumulation of moisture may occur or in contact with materials that might

 cause staining, denting, or other damage.

 2. Material Handling:

 Use care in unloading, storing, and erecting the materials to prevent bending,

 warping, and twisting. Protect finish and edges from damage. The protective

 film on the panel surface is to remain in place until installation and shall be

 removed immediately upon completion.

1.8 PROJECT CONDITIONS

 A. Field Measurements:

 Verify location and dimension of all elements related to the installation of the

 wall panel assembly. Indicate those measurements on the shop drawings.

 B. Limitations:

 Proceed with installation of the wall panel assembly only when existing site conditions

 comply with manufacturer's recommendations.

1.9 WARRANTY

 A. Exterior Cladding Panel:

 1. Panel:

 The integrity of the panel bond will remain intact for a minimum of five (5)

 years from the Date Of Substantial Completion.

 2. Finish:

 a. Polyester:

 1) The finish will not have a Fade Differential of greater than 8E units.

 Testing shall be in accordance with ASTM D2244.

 2) The finish will not have a Chalk Rating of less than 6.

 Testing shall be in accordance with ASTM D4214.

 3) Warranty period shall be five (5) years from the Date Of

 Substantial Completion.

 b. Polyvinylidene Fluoride (PVDF):

 1) The finish will not have a Fade Differential of greater than 5E units.

 Testing shall be in accordance with ASTM D2244.

 2) The finish will not have a Chalk Rating of less than 8.

 Testing shall be in accordance with ASTM D4214.

 3) The finish will not check, peel, lose adhesion or fracture (other

 than minute fractures which may develop due to fabrication and

 which are acceptable by industry standards on the Date Of

 Substantial Completion).

 4) Warranty period shall be thirty (30) years from the Date Of

 Substantial Completion.

 c. Anodized:

 1) The finish will not check, peel, lose adhesion or fracture (other

 than minute fractures which may develop due to fabrication and

 which are acceptable by industry standards on the Date Of

 Substantial Completion).

 2) Warranty period shall be twenty (20) years from the Date Of

 Substantial Completion.

 B. Installation System:

 1. Fabricator and/or installer standard form in which they agree to repair or replace

 components of exterior cladding wall panel assemblies that fail in materials or

 workmanship within specified warranty period.

 2. Weathertight warranties or other such guarantees regarding installation shall be the

 responsibility of the installing contractor.

 C. Accessories:

 Warranties or other such guarantees regarding accessories used during installation shall

 be the responsibility of the installing contractor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

 A. Acceptable Manufacturer:

 Citadel Architectural Products; 6198 W Airport Blvd; Greenfield, IN 46140

 ph: (800) 446-8828; fax: (800) 247-2635; www.citadelap.com; info@citadelap.com

 B. Subtitutions:

 1. Not permitted without approval of the architect 10 days prior to bid.

 2. Items being submitted for consideration must be of the same function

 and meet the performance requirements set forth in this section.

 C. Requests for substitutions will be considered in accordance with provisions of

 Section 01 60 00 - Product Requirements.

 1. Product Data:

 Submit product data including testing performed by a qualified agency

 indicating compliance with performance requirements specified in this section.

 2. Samples:

 Submit two (2) samples 3" x 5" of each proposed product substitution.

2.2 WALL PANEL ASSEMBLY

 A. Exterior Cladding Panel:

 1. Panel:

 SinoCore® as manufactured by Citadel Architectural Products

 a. Composition:

 Face: .010" prefinished textured aluminum

 (or) .024" prefinished smooth aluminum

 Core: 4mm high density polypropylene

 Back: .010" primed smooth aluminum

 b. Thickness: 4mm (nominal)

 c. Weight: 0.58 lbs/ft² (textured face), 0.77 lbs/ft² (smooth face)

 d. Tolerance:

 Thickness: ±1/32"

 Length / Width: +0, -1/8"

 Squareness: 1/64" per lineal ft

 e. Performance:

 1) Surface Burning Characteristics:

 Panel shall have a Class A rating with a Flame Spread Index

 less than 25, and a Smoke Developed Index less than 450.

 Testing shall be in accordance with ASTM E84.

 2. Finish:

 a. Polyester:

 1) Type:

 High performance, baked-on polyester coating.

 2) Color:

 a) As selected by Architect from manufacturer's color guide.

 b) Custom color to match Architect's standard.

 3) Composition:

 a) Two-Coat Colors:

 0.2-mil primer coat, 0.8-mil color coat

 4) Performance:

 a) Gloss:

 Finish shall have a gloss value of 5-80 at 60°.

 Testing shall be in accordance with ASTM D523.

 b) Pencil Hardness:

 Finish shall have a value of F-2H.

 Testing shall be in accordance with ASTM D3363.

 c) Flexibility:

 Finish shall have a value of 0-1 T-bend, no pick off.

 Testing shall be in accordance with ASTM D4145.

 d) Reverse Impact:

 Finish shall have a value of no pick off at 1500 x metal thickness.

 Testing shall be in accordance with ASTM D2794.

 e) Salt Spray Resistance:

 Finish shall have a value of No Face Blistering; None up

 to few #6 edge and scribe blisters when tested at 1000 hrs

 using 5% salt fog @ 95° F.

 Testing shall be in accordance with ASTM B117.

 f) Humidity Resistance:

 Finish shall have a value of Passes 1000 hrs, None up to

 few #8 blistering using 100% relative humidity @ 95° F.

 Testing shall be in accordance with ASTM D714, ASTM D2247.

 g) Exterior Exposure:

 Finish shall have a value of Max 8 fade and Max 6 chalk at

 5 yrs @ 90°, south Florida.

 Testing shall be in accordance with ASTM D2244, ASTM D4214.

 b. Polyvinylidene Fluoride (PVDF):

 1) Type:

 Kynar 500® coating using 70% resin.

 Finish shall be in conformance with AAMA 2605.

 2) Color:

 a) As selected by Architect from manufacturer's color guide.

 b) Custom color to match Architect's standard.

 3) Composition:

 a) Two-Coat Colors:

 0.2-mil primer coat, 0.8-mil color coat

 b) Three-Coat Colors:

 0.2-mil primer coat, 0.8-mil color coat, 0.7-mil clear coat

 4) Performance:

 a) Gloss:

 Finish shall have a gloss value of 20-35 at 60°.

 Testing shall be in accordance with ASTM D523.

 b) Solar Reflectance:

 Finish shall have a value of >25% initial, >15% after

 3 years for Steep Slope and a value of >65% initial, >50%

 after 3 years for Low Slope.

 Testing shall be in accordance with ASTM E903.

 c) Emissivity:

 Finish shall have a value of 0.80 (80%) min.

 Testing shall be in accordance with ASTM C1371.

 d) Pencil Hardness:

 Finish shall have a value of F-2H.

 Testing shall be in accordance with ASTM D3363.

 e) Flexibility:

 Finish shall have a value of 0-2 T-bend, no pick off.

 Testing shall be in accordance with ASTM D4145.

 f) Adhesion:

 Finish shall have a value of No Adhesion Loss.

 Testing shall be in accordance with ASTM D3359.

 g) Reverse Impact:

 Finish shall have a value of No Cracking Or Adhesion Loss.

 Testing shall be in accordance with ASTM D2794.

 h) Abrasion:

 Finish shall have a value of 65-85 l/mil.

 Testing shall be in accordance with ASTM D968.

 i) Mortar Resistance:

 Finish shall have a value of No Effect.

 Testing shall be in accordance with ASTM C267.

 j) Detergent Resistance:

 Finish shall have a value of No Effect using 3% detergent

 @ 100 F° (72 hrs).

 Testing shall be in accordance with ASTM D2248.

 k) Acid Resistance:

 Finish shall have a value of No Effect using 10% muriatic

 acid (24 hrs) and No Effect using 20% sulfuric acid (18 hrs).

 Testing shall be in accordance with ASTM D1308.

 l) Acid Rain:

 Finish shall have a value of No Objectionable Color Change

 after 15 cycle min.

 Testing shall be in accordance with Kesternich SO2, DIN 50018.

 m) Alkalai Resistance:

 Finish shall have a value of No Effect using 10%, 25%

 NaOH (1 hr).

 Testing shall be in accordance with ASTM D1308.

 n) Salt Spray Resistance:

 Finish shall have a value of No Face Blistering; Max average

 1/16" scribe creep, passes 4000 hrs using 5% salt fog @ 95° F.

 Testing shall be in accordance with ASTM B117.

 o) Humidity Resistance:

 Finish shall have a value of Passes 4000 hrs, No #8 blisters

 using 100% relative humidity @ 95° F.

 Testing shall be in accordance with ASTM D714, ASTM D2247.

 p) Exterior Exposure:

 Finish shall have a value of Max 5 fade and Max 8 chalk at

 10 yrs @ 45°, south Florida.

 Testing shall be in accordance with ASTM D2244, ASTM D4214.

 c. Anodized:

 1) Type:

 AA-C22-A21 (clear)

 AA-C22-A23 (colored)

 2) Color:

 As selected by Architect from manufacturer's color guide.

 3) Composition:

 i. Anodized (clear):

 barrier, aluminum oxide, nickel/hydrate seal

 ii. Anodized (colored):

 barrier, aluminum oxide, colorant, nickel/hydrate seal

 4) Performance:

 a) Salt Spray Resistance:

 Testing shall be in accordance with ASTM B117.

 b) Acid Dissolution:

 Testing shall be in accordance with ASTM B680.

 c) Gloss:

 Testing shall be in accordance with ASTM D523.

 d) Coating Mass:

 Testing shall be in accordance with ASTM B137.

 B. Installation System:

 1. One Piece Molding System:

 a. Description:

 Field-assembled installation system consisting of exterior cladding panels,

 trim moldings, silicone sealant, and accessories to provide

 a barrier system.

 b. Trim Moldings:

 1) E-301 Horizontal / Vertical

 2) E-302 Outside Corner

 3) E-303 Inside Corner

 4) E-304 Perimeter J

 5) E-305 Drip Edge

 6) E-306 Horizontal / Vertical (Reveal)

 2. Two Piece Molding System:

 a. Description:

 Field-assembled installation system consisting of exterior cladding panels,

 trim moldings, silicone sealant, and accessories to provide

 a barrier system.

 b. Trim Moldings:

 1) C20-401 Horizontal / Vertical

 SC-8240 Receiver

 2) C20-402 Horizontal / Vertical

 SC-8240 Receiver

 3) SC-604 Perimeter J

 R20-403 Receiver

 4) SC-605 Drip Edge

 R20-403 Receiver

 5) C20-404 Inside Corner

 R20-404 Receiver

 6) C20-405 Outside Corner

 R20-405 Receiver

 7) C20-406 Horizontal / Vertical (Reveal)

 R20-406 Receiver

 8) C20-407 Perimeter J (Reveal)

 R20-407 Receiver

 C. Accessories:

 1. Extrusions:

 a. Shall conform with ASTM B211 and the manufacturer's recommendations.

 b. Shall be applied in accordance with the panel manufacturer's installation

 guidelines.

 2. Sealants:

 a. Selected from the panel manufacturer's approved list of sealants.

 b. Shall be applied in accordance with both the panel manufacturer's installation

 guidelines and the sealant manufacturer's recommendations.

 3. Fasteners:

 a. Selected by contractor to suit project requirements.

 b. Shall be applied using the recommended fastener schedule in accordance

 with panel manufacturer's installation guidelines.

 c. Shall be coated to prevent corrosion and/or reaction with other materials.

 d. Shall be concealed except where unavoidable. Exposed fasteners shall

 be finished to match adjoining metal.

 4. Flashing:

 a. Selected by contractor to suit project requirements.

 b. Shall be installed in such a manner to maintain the integrity of the wall system

 against moisture intrusion.

PART 3 - EXECUTION

3.1 EXAMINATION

 A. Examine substrate to receive the work of this section to verify that the conditions are

 acceptable for installation.

 1. Substrate to receive panels shall be even, smooth, sound, clean, dry, and free from

 defects detrimental to work. Notify contractor in writing of conditions detrimental to

 proper and timely completion of the work.

 2. Substrate to receive panels shall be in vertical and horizontal alignment with no

 more deviation than 1/4" in 20'.

 B. Proceed with installation only after all unsatisfactory conditions have been corrected in

 a manner acceptable to installer. Starting work within a particular area will be construed

 as installer's acceptance of surface conditions.

3.2 PREPARATION

 A. Verify dimensions as required.

 B. Protect adjacent work areas and finished surfaces to prevent damage that otherwise

 might occur during the work of this section.

3.3 INSTALLATION

 A. Wall panel assembly shall be installed in accordance with the manufacturer's written

 installation guidelines and the approved set of shop drawings.

 B. Erect wall panel assembly level and true to the intended plane.

 C. Maximum deviation from vertical and horizontal alignment of erected wall panel assembly

 shall be no more than 1/4" in 20'-0".

 D. Maximum deviation in panel flatness shall be 0.6% of the assembled units.

 E. Seal all joints as required using methods and materials as recommended by the panel

 manufacturer.

3.4 CLEANING

 A. Remove panel masking immediately after installation. Delay will result in difficulty

 with removal and possibly residue on the panel surface.

 B. Remove temporary coverings and protection to adjacent work areas.

 C. Remove and legally dispose of construction debris from project site.

END OF SECTION