PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Honeycomb reinforced exterior stone cladding system.
2. Metal framing support components.

B. Related Sections:

1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section [07 9200 - Joint Sealers.] [__ ____ - _____.]
3. Section 07 4446 - Lightweight Stone Faced Wall Panels.
4. Section 09 7500 - Stone Wall Facings.

1.2 REFERENCES

A. American Society of Civil Engineers (ASCE) 7 - Minimum Design Loads for Buildings and Other Structures.

B. ASTM International (ASTM):

1. B221 - Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wires, Shapes and Tubes.
2. NFPA285 – Standard Fire test method for evaluation of fire propagation characteristics of exterior non – load – bearing wall assemblies containing combustible components.
3. C880 / C880M-15, Standard Test Method for Flexural Strength of Dimension Stone.
4. C372-94(R 2012), Standard Test Method for Linear Thermal Expansion.
5. B117-16, Standard Test Method for Salt Spray Resistance.
6. C67-14, section 9, Standard Test Method for Freezing and Thawing.
7. C518-10, Standard Test Method for Thermal Conductivity and Thermal Resistance.
8. C297/C364(C365)/C393/C273, Standard Test Method for Flat Tensile Strength/Compressive Strength/Flexural Shear Strength/Core Shear Strength.
9. D897 - Standard Test Method for Tensile Properties of Adhesive Bonds.
10. D1761 - Standard Test Method for Mechanical Fasteners in Wood.
11. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials (UL 723, UBC 8-1, NFPA255).
12. E283 - Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
13. E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors under the Influence of Wind Loads.
14. E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
15. E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials, and TAS 201, TAS 202, TAS 203 testing in accordance with Florida Building code for Miami-Dade County requirements.
16. E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

C. Australian Standard:

1. AS/NZS 1530.3:1999 Simultaneous determination of ignitability, flame propagation, heat release and smoke release.

E. British Standards (BS):

1. BS 8414-1:2002 Fire performance of external cladding systems–Part 1 : test method for non-loadbearing external cladding systems applied to the face of the building.

F. Canadian Standard:

1. CAN/ULC S114-05, standard method of test for determination of non-combustibility in building materials.

G. Stone Materials Quality Inspection and Test Center of China Building Materials Industry: GB/T 9966 - Test Methods for Natural facing Stones.

1.3 SYSTEM DESCRIPTION

A. Design Requirements; design exterior stone cladding system to withstand:

1. Positive and negative design wind loads acting normal to wall plane in accordance with [Building Code] [ASCE 7] [____] with deflection of any member not to exceed [L/175,] [__,] tested to ASTM E330.
2. Movement caused by an ambient temperature range of [120] [__] degrees F and a surface temperature range of [160] [__] degrees F.

B. Performance Requirements:

1. Air infiltration: Maximum 0.01 CFM per square foot, tested to ASTM E283 at pressure differential across assembly of 6.24 PSF.
2. Water resistance: No leakage, tested to ASTM E331 at 12.0 PSF.
3. Uniform FUJITSUE556:
    a. Two panel specimen: No damage, tested to ASTM E330 at 65 PSF positive and negative.
    b. Single panel specimen: No damage, tested to ASTM E330 at 260 PSF positive and negative.
4. Uniform load structural:
    a. Two panel specimen: No damage and maximum 0.07 inch permanent set, tested to ASTM E330 at 97.5 PSF positive and negative.
    b. Single panel specimen: No damage and maximum 0.150 inch permanent set, tested to ASTM E330 at 390 PSF positive and negative.
5. Impact resistance: No penetration, tested to ASTM E1996 at 50 FPS.
6. Freeze/thaw resistance: No delamination, cracking, chipping, or visible distortion; tested to GB/T 9966.1 at 25 cycles.
7. Adhesive bond: Average bond strength of 284 PSI, tested to ASTM D897.
8. Tensile bond strength for adhesive: Average of 358 PSI, tested to ASTM D897 after 25 thermocycles.
9. Shear load strength for riveted brackets: Average of 172 PSI, tested to ASTM D1761.
10. Fire hazard classification: Maximum flame spread/smoke developed rating of 10/155, tested to ASTM E84.

1.4 SUBMITTALS

A. Submittals for Review:

1. Shop Drawings: Include plans, elevations, and details, size and layout of panels, trim, accessories, supports, and attachments.
2. Samples: [4 x 4] [__ x __] inch panel samples showing maximum variations in color and texture.

B. Quality Control Submittals:

1. Certification: Manufacturer's certification that composite building panel system meets specified design and performance criteria.

C. Sustainable Design Submittals:

1. Regional materials.

1.5 QUALITY ASSURANCE

A. Design Concept:

1. Requirements of Contract Documents that relate to exterior stone cladding system are intended to establish overall design intent and standard of quality.
2. Structural design of system and details and methods of construction are Contractor's responsibility. Size and thickness of members, location and type of supports and attachments, and details of functional and concealed components that are not of an aesthetic nature may be modified from that shown if a more efficient method can be used.
3. Maintain design concept shown, without materially increasing member sizes and without altering profiles, finishes, and alignments. Make modifications from what is shown as may be necessary to meet performance requirements and coordinate work.
4. Show deviations from requirements of Contract Documents on Shop Drawings.

B. Installer Qualifications:

1. Minimum [3] [__] years [documented] experience in work of this Section.
2. Approved by panel manufacturer.

C. Obtain stone from single quarry and from same area within quarry.

D. Mockup:

1. Size: [4] [__] feet high x [8] [__] feet wide.
2. Show:
    a. Stone color and texture range.
    b. Support components and attachments.
    c. Joint profile.
3. Locate [where directed.] [____.]
4. Approved mockup may [not] remain as part of the Work.

E. Pre-Installation Conference:

1. Convene at site [2] [__] weeks prior to beginning work of this Section.
2. Attendance: Architect, [Owner,] [Contractor,] [Construction Manager,] panel manufacturer's representative, panel installer, and related trades.
3. Review and discuss: Contract Documents, panel manufacturer's literature, project conditions, scheduling, and other matters affecting application.

1.6 DELIVERY, STORAGE AND HANDLING

A. Store panels off ground; prevent contact with materials that could cause staining or damage.

1.7 WARRANTIES

A. Provide manufacturer's 10 year warranty against delamination and separation of panel components.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Contract Documents are based on products by TerraCORE Panels LLC (www.terracorepanels.com)

B. Substitutions: [Under provisions of Division 01.] [Not permitted.]

2.2 MATERIALS

A. Lightweight Stone Panels:

1. Type: Natural stone bonded to fiberglass top sheet and lightweight aluminum honeycomb core, with aluminum sheet backing.
2. Thicknesses:
    a. Stone: [4] [6] [8] [10] mm.
    b. Fiberglass top sheet: 1 mm.
    c. Honeycomb core: [8] [12] [17] [23] [__] mm.
    d. Aluminum backing sheet: 1 mm.
    e. Overall panel thickness: [__] mm.
3. Stone type: [____.]
4. Surface finish: [Honed.] [Flamed.] [Polished.] [Antiqued.] [Sandblasted.] [Acid washed.] [Bushhammered.]

B. Aluminum Extrusions:

1. ASTM B221, 6063-T5 or T6 alloy and temper.
2. Finish: [Clear] [Bronze] anodized where exposed.

2.3 ACCESSORIES

A. Fasteners: Type suited to application, stainless or corrosion resistant coated steel.

B. Joint Sealers: Specified in Section [07 9200.] [__ ____.]

2.4 FABRICATION

A. Fabricate support components using manufacturer's standard [wide] [narrow] interlocking channel system.

B. Attach channels to back of panels in factory.

C. Overall System Depth: [__] inches.

D. Where indicated fabricate [90] [__] degree panel returns in factory with hairline joints to appear as monolithic stone.

E. [Apply clear sealer to exposed stone surfaces at factory.] [Do not seal stone at factory.]

PART 3 EXECUTION

3.1 INSTALLATION

A. Install panel system in accordance with manufacturer's instructions and approved Shop Drawings.

B. Set panels aligned, level, and plumb.

C. Fasten receiving channels to supports. Snap panels into receiving channels.

D. Fill panel joints with joint sealer as specified in Section [07 9200.] [__ ____.]

E. Allowable Tolerances:

1. Maximum offset from alignment of adjacent members in same plane: [1/16] [__] inch.
2. Maximum variation from plane: [1/8] [__] inch in 10 feet, noncumulative.
3. Maximum variation from indicated position: [1/4] [__] inch.