***Indiana Limestone Company:*** *November 4, 2016*

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***Product Guide Specification:***

*Specifier Note: This product guide specification is written according to the Construction Specifications Institute*

*(CSI) current versions of MasterFormat, SectionFormat and PageFormat and as described in various Practice*

*Guides.*

*Use this guide specification as the basis for developing a project specification.*

*Layout of Header/Footer is based on PageFormat, edit as necessary in compliance with project requirements.*

*Section must be carefully reviewed and edited by Architect/Design Professional to meet requirements of project*

*and local building code.*

*Coordinate this section with Drawings and other specification sections; coordinate these numbers and titles with*

*sections included for specific project.*

*Brackets* ***[\_\_\_\_\_]****,* ***and/or****,* ***<\_\_\_\_\_>*** *and “or” are used to indicate when a selection is required.*

*Windows 2010 - Upon completion of section editing, you may turn-off “Specifier Notes” as follows; click on “File”*

*then on “Options” then “Display” and remove check-mark for “Hidden text” in two locations.*

**SECTION 04 4246**

**EXTERIOR LIGHTWEIGHT STONE CLADDING SYSTEM**

1. **GENERAL**
   1. SUMMARY
      1. Section Includes:
         1. Honeycomb reinforced exterior Indiana Limestone cladding system.
         2. Metal framing support components.
      2. 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.
   2. REFERENCES
      1. American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures.
      2. ASTM International (ASTM):
         1. B221 - Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wires, Shapes and Tubes.
         2. C880 - Standard Test Method for Flexural Strength of Dimension Stone.
         3. D897 - Standard Test Method for Tensile Properties of Adhesive Bonds.
         4. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
         5. E283 - Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
         6. E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors under the Influence of Wind Loads.
         7. E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
         8. 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.
         9. E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
         10. Notice of Acceptance Miami-Dade County in conjunction with HVHZ (High Velocity Hurricane Zone) Certification.
   3. SYSTEM DESCRIPTION
      1. 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 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.
      2. Performance Requirements:
         1. Air infiltration: Maximum 0.02 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 15.0 PSF.
         3. Uniform load deflection:
            1. Two panel specimens: No damage, tested to ASTM E330 loads per NOA Miami-Dade and HVHZ positive and negative pressures.
            2. Single panel specimen: No damage, tested to ASTM E330 loads per NOA Miami-Dade and HVHZ positive and negative pressures.
         4. Impact resistance: No penetration, tested to TAS 201-94 at 50 FPS.
         5. Freeze/thaw resistance: No delamination, cracking, chipping, or visible distortion; tested to GB/T 9966.1 at 25 cycles.
   4. SUBMITTALS

*Limiting submittals to only those actually required helps to minimize liability arising from the review of submittals. Minimize submittals on smaller, less complex projects.*

*Include the following for submission of shop drawings, product data, and samples for the Architect's review.*

* + 1. 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.
    2. Quality Control Submittals:
       1. Certification: Manufacturer's certification that composite building panel system meets specified design and performance criteria.

*Include the following for submission of sustainable design submittals.*

* + 1. Sustainable Design Submittals:
       1. Regional materials.
  1. QUALITY ASSURANCE
     1. 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.
     2. Installer Qualifications:
        1. Minimum 3 years’ experience in work of this Section.
        2. AND/OR Certified and Approved by panel manufacturer.
     3. Obtain stone from single quarry and from same area within quarry.

*Include the following for full size mockups for review of construction, coordination of work of several sections, testing, or observation of operation.*

* + 1. Mockup:
       1. Size: [4] [\_\_] feet high x [8] [\_\_] feet wide.
       2. Show:
          1. Stone color and texture range.
          2. Support components and attachments.
          3. Joint profile.
       3. Locate [where directed.] [\_\_\_\_.]
       4. Approved mockup may [not] remain as part of the Work.
    2. 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. DELIVERY, STORAGE AND HANDLING
     1. Store panels off ground; prevent contact with materials that could cause staining or damage.
  2. WARRANTIES
     1. Provide manufacturer’s 10 year warranty against delamination and separation of panel components.

1. **PRODUCTS**
   1. MANUFACTURERS

Contract Documents are based on products by the Indiana Limestone Company

* + 1. Indiana Limestone Company:
       1. Address: 123 South College Avenue, Bloomington, Indiana 47404
       2. Phone: 214-388-1228
       3. Website: [www.indianalimestonecompany.com](http://www.indianalimestonecompany.com)
       4. Product Specialist: Brent Cannedy, Specified Products 972-821-3496
    2. Provide limestone for entire project from the following quarry:
       1. [Empire Quarry – 301 Main Street, Oolitic, Indiana 47451.]
       2. [Victor Oolitic Quarry – 7850 South Victor Pike, Bloomington, Indiana 47403]
    3. Substitutions: [Under provisions of Division 01.] [Not permitted.]
  1. MATERIALS
     1. Lightweight Stone Panels:
        1. Type: Natural stone bonded to fiberglass top sheet and lightweight aluminum honeycomb core, with aluminum or fiberglass sheet backing.
        2. Thicknesses:

*Edit the following to indicate desired stone thickness. 6 mm is standard; textured finishes require additional thickness – Contact the Indiana Limestone Company.*

* + - * 1. Stone: 3.8 - ¼ inch (9.5 – 6.4 mm)
        2. Fiberglass top sheet: 1 mm.

*Edit the following to indicate desired honeycomb core thickness. ¼” (6 mm) is standard; additional thicknesses to 48 mm are available*.

* + - * 1. Honeycomb core cell diameter: ¼ inch (6 mm).
        2. Aluminum or fiberglass backing sheet: 1 mm.

*Edit the following to indicate overall panel thickness. Coordinate with stone, core, and backing thicknesses specified above.*

* + - * 1. Overall panel thickness: 1 inch (25 mm).
      1. Indiana Limestone: Complies with ASTM C568/C568M, Type II (Medium Density) Classification
         1. Variety: Indiana Limestone
         2. Absorption by Weight: 7.5 maximum percentage, ASTM C97/C97M
         3. Density: 135 lbs/cu ft (2160 kg/cu m), minimum; ASTM C97/C97M
         4. Compressive Strength: 4000 psi (28 MPa), minimum; ASTM C170/C170M
         5. Modulus of Rupture: 700 psi (3.4 MPa), minimum; ASTM C99/C99M

*Specifier Note: Edit the following list of limestone material characteristics including color, grade, and finish in compliance with project requirements. Refer to the Indiana Limestone Handbook, latest edition, for additional information*.

* + - 1. Color: [Buff] [Silver buff] [Gray] [Full color blend] [As indicated under PRODUCT TYPES article] of [As indicated on drawings]

*Specifier Note: Indicate the applicable Grade Classifications of limestone masonry selected for the project, and indicate location(s) on the drawings*

Standard – Fine to moderately large-grained limestone permitting an average amount of typical limestone characteristics

Rustic – Fine to very coarse-grained limestone permitting an above=average amount of typical limestone characteristics

1. Grade Classifications: Provide limestone of the following grade(s) at locations as indicated on the drawings in compliance with samples and dhop drawings approved by the architect
   1. [Standard] and/or [Rustic]

*Edit the following paragraph to indicate stone finish. As noted 2.2-A-2, some finishes require more stone thickness – please contact The Indiana Limestone Company.*

* + - 1. Surface finish: [Smooth] [Honed.] [Polished.] [Antiqued.] [Sandblasted.] [Bushhammered.]
    1. Aluminum Extrusions:
       1. ASTM B221, 6063-T5 or T6 alloy and temper.

*Include the following where aluminum extrusions will be exposed to view, such as in an open joint system (standard is Dark Bronze if not specified).*

* + - 1. Finish: [Clear] [Bronze] anodized where exposed.
  1. ACCESSORIES
     1. Sub-framing ISO Clip Thermal Spacer: 50ksi 16ga ASTM A792 Grade 33 [GalvalumeTM, galvanized] steel clip with integral glass fibre reinforced polyamide thermal isolator pad and adjustable depth suitable for vertical and horizontal sub-girts. Effective wall assembly R-Value determined by Architect in combination with Insulation system.
        1. Distributed by Specified Products Inc, 4911 Olson Drive, Dallas TX 75227 214-388-1228
     2. Fasteners: Type suited to application, stainless or corrosion resistant coated steel.
     3. Joint Sealers: If a sealed system, Specified in Section [07 9200.] [\_\_ \_\_\_\_.] (If an Open Air Rainscreen - )NOT APPLICABLE
     4. If System is Open Air Rainscreen, exposed edges of honeycomb panel is to be resin filled at the factory for aesthetic appearances. Supply sample for approval and architectural review.
  2. FABRICATION
     1. Fabricate support components using manufacturer’s standard wide interlocking channel system.
     2. Stainless steel Rivnuts for attachment of Clips to back of panel are to be factory embedded prior to lamination of stone.
     3. Overall System Depth: Approximately 2 ¼ inches with shimming.
     4. Where indicated fabricate panel returns in factory with hairline joints to appear as monolithic stone.
     5. [Apply clear sealer to exposed stone surfaces at factory.] [Do not seal stone at factory.]

1. **EXECUTION**
   1. EXAMINATION  
      1. Examine surfaces to receive limestone panels and conditions under which panels will be installed, with Installer present, for compliance with specified requirements.
      2. Submit written report, validated by Installer, listing any conditions that are not in compliance with specified requirements.
      3. Do not proceed with installation until surfaces and conditions comply with specified requirements for limestone panels or other related work that affects this Work.
   2. PREPARATION  
      1. Advise installers of related work about specific requirements for proper placement of attachment or anchoring points to the structure and flashing of this type of work
      2. Prior to setting, clean limestone surfaces that have become dirty or stained by removing soil, stains and other foreign materials
         1. Thoroughly clean limestone by scrubbing with fiber brushes followed by thorough drenching with clean clear water and using only mild cleaning compounds that do not contain any acids, caustic or abrasive materials.
   3. INSTALLATION
      1. Install panel system in accordance with manufacturer's instructions and approved Shop Drawings.
      2. Set panels aligned, level, and plumb.
      3. Install track to substrate per engineered anchoring. Follow manufacturer’s procedure as per the NOA testing protocol or otherwise included in the submittal package.

* + 1. If a sealed system, fill panel joints with backer rod and joint sealer as specified in Section [07 9200.] [\_\_ \_\_\_\_.]
  1. **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.
  2. **ADJUSTING**
     1. Repair of damages stone is permitted as some chipping of the stone is expected; repair of small chips is not required if it does not detract from the overall appearance of the work; or impair effectiveness of the attachment methodology
     2. Criteria for acceptance of chips and repairs will be based on industry standards and practices, unless other criteria is mutually agreed upon, in writing, by the panel supplier and the Architect
  3. **CLEANING**
     1. Clean limestone panels using clean water and stiff fiber bristle brushes. Do not use wire brushes, acidic type cleaning agents, or other materials or methods that could damage stone.
     2. Mechanical or pressure cleaning methods may be used if approved in writing by the Architect
  4. **PROTECTION**  
     1. Protect limestone when adjacent brick is being acid-washed
     2. Provide protection and maintain conditions, in a manner acceptable to fabricator and installer, that ensures limestone panels will be without damage or deterioration by the Date of Substantial Completion.

END OF SECTION