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**SECTION 07 42 43 – COMPOSITE WALL PANELS****Wallshell® Thermal Panoply™****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Wall panel assembly consisting of:
    - a. Exterior Cladding Panel (fiber-cement board)
    - b. Insulation Board (rock wool)
    - c. Backboard (glass-fiber reinforced concrete membrane)
  2. The extent of the wall panel assembly as indicated in these specifications and in the drawings
- B. Related Sections:
1. Section 05 41 00 - Structural Metal Stud 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 40 00 - Entrances, Storefronts, and Curtain Walls
  7. Section 08 50 00 - Windows
  8. Section 08 80 00 - Glazing

**1.2 REFERENCES****A. American Society for Testing and Materials (ASTM)**

1. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
2. ASTM C297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
3. ASTM C303 Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.
4. ASTM C356 Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat.
5. ASTM C1354 Standard Test Method for Strength of Individual Stone Anchorages in Dimension Stone.

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|----------------|---|
| 6. ASTM D897   | Standard Test Method for Tensile Properties of Adhesive Bonds.  |
| 7. ASTM D2794  | Standard Test Method For Resistance of Organic Coatings To The Effects of Rapid Deformation (Impact).   |
| 8. ASTM E72    | Standard Test Method of Conducting Strength Tests of Panels for Building Construction.  |
| 9. ASTM E84    | Standard Test Method for Surface Burning Characteristics of Building Materials.   |
| 10. ASTM E136  | Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.   |
| 11. ASTM E283  | Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.       |
| 12. ASTM E330  | Standard Test Method for Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference. |
| 13. ASTM E331  | Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Air Pressure Difference.  |
| 14. ASTM E2485 | Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings.                                      |

### 1.3 SYSTEM DESCRIPTION

#### A. Design Requirements:

##### 1. Rain Screen System:

Wall panel assembly shall be designed in accordance with manufacturer's guidelines, install according to the Wallshell® Thermal Panoply™ installation manual thus providing a rain screen 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, undue stress on fasteners or other detrimental effects due to accumulation

of dead loads and various live loads.

### 3. Allowable Wind Load

Wall panel assembly shall be designed to withstand the positive and negative wind load pressures 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.

## 1.4 SUBMITTALS

#### A. Product Data:

1. Submit manufacturer's data sheet for specified product.
2. Submit manufacturer's standard detail drawings relevant to the project.
3. Submit manufacturer's storage and handling instruction, installation guidelines for specified product.
4. 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.
5. 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, and gaskets, flashing and accessories.

#### C. Samples :

1. Submit two samples 6x8 inch (150x200 mm) of each product specified.
2. Submit two samples 6x8 inch (150x200 mm) of each finish specified.

#### D. Code Compliance:

Submit documents demonstrating the compliance of products with local building code, such as test reports, or Evaluation Reports meeting specified performance requirements from an independent testing agency.

#### E. Warranty:

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

## 1.5 QUALITY ASSURANCE

**A. Qualifications:****1. Manufacturer:**

Manufacturer shall have a minimum of ten years experience in the manufacture of this product.

**2. Installer:**

Installer shall be experienced in performing work of this section and in work of similar scope required by this project. Installer shall be trained by manufacturer or representative.

**B. Mock-up Wall:**

Provide a mock-up wall as evaluation tool for product and installation workmanship.

**C. Pre-Installation Meeting:**

Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements and project requirements.

**D. Color:**

Some degree of color variation is to be expected.

**1.6 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 occurred during shipment.

**B. Storage and Protection:****1. Storage:**

Materials should be stored horizontally and kept dry on pallets or platforms off the ground, covered with a suitable ventilated and waterproof cover. Do not store materials where accumulation of moisture may occur or in contact with materials that might cause staining, denting, or other damage.

If panels are exposed to water or water vapor prior to installation, allow to completely dry before installing. Moisture saturation before installation can cause panel shrinkage and damage.

**2. Material Handling:**

Panels **MUST** be carried on edge. Do not carry or lift panels flat. Improper handling may cause cracking or panel damage.

Do not stack product more than two (2) pallets high.

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## 1.7 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.

## 1.8 WARRANTY

### A. Exterior Cladding Panel:

1. Provide manufacturer's 20-years limited warranty against manufactured defects in Thermal Panoply™ Panels.
2. Provide manufacturer's 15-years limited warranty against manufactured defects in panel finish.
3. Warranty provides for the original purchaser and transfers to one subsequent owner. See Warranty for detailed information on terms, conditions and limitations.

### B. Installation System:

1. Provide fabricator 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. Provide barrier system warranties or other such guarantees regarding installation shall be the responsibility of the installing contractor.

### C. Accessories:

Provide warranties or other such guarantees regarding accessories used during installation shall be the responsibility of the installing contractor.

## **PART 2 – PRODUCT: COMPOSITE WALL PANELS**

### 2.1 MANUFACTURERS

#### A. Basis of Design:

Walpanel Inc.      [www.wallshell.com](http://www.wallshell.com)

#### B. Substitutions:

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 samples 6x8 inch (150x200 mm) of each proposed product substitution.

## 2.2 PERFORMANCE CRITERIA

A. Flexural Strength:

16.96 psf (812 Pa) according to ASTM C1185.

B. Must comply with ASTM C1186:

1. Water Absorption: 0.05%
2. Water Tightness: No visible droplets or surface wetting
3. Heat-Rain: Pass (No crazing, cracking, or other deleterious effects, surface or joint changes observed in any specimen)

C. Single Fastener Transverse Wind Load:

139.93 psf (6.7 kPa) according to ASTM C1354.

D. Fire Resistance:

Class A according to ASTM E84.

E. Insulation Characteristics Temperature Rise:

11 °C according to ASTM E136.

F. Insulation R-Value

|                      |     |     |     |      |      |      |      |      |      |      |
|----------------------|-----|-----|-----|------|------|------|------|------|------|------|
| Insulation Thickness | 38  | 44  | 57  | 70   | 83   | 95   | 108  | 121  | 133  | 146  |
| R-Value              | 5.8 | 6.7 | 8.7 | 10.6 | 12.5 | 14.4 | 16.4 | 18.3 | 20.2 | 22.1 |

All size measures in mm

G. Nominal Strength for Transverse Wind Load:

Positive: 144 psf (6895 Pa); Negative: 144 psf (6895 Pa)

H. Mass Change after Freeze/Thaw Cycles:

No deleterious effects (+0.25%)

## 2.3 WALL PANEL ASSEMBLY

### A. Panel:

Wallshell® Thermal Panoply™ panel (insulated composite wall panel) .

1. Thickness of Carrier Board:

1/4 inch (6 mm)

2. Thickness of Insulation:

|                      |                      |
|----------------------|----------------------|
| 1-1/2 inch (38 mm);  | 2-1/4 inch (57 mm);  |
| 1-3/4 inch (44 mm);  | 2-3/4 inch (70 mm);  |
| 3-1/4 inch (83 mm);  | 3-3/4 inch (95 mm);  |
| 4-1/4 inch (108 mm); | 4-3/4 inch (121 mm); |
| 5-1/4 inch (133 mm); | 5-3/4 inch (145 mm)  |

3. Thickness of Backboard:

|                   |                   |                  |
|-------------------|-------------------|------------------|
| 0 inch (0 mm);    | 1/16 inch (2 mm); | 1/8 inch (3 mm); |
| 3/16 inch (4 mm); | 1/4 inch (6 mm)   |                  |

4. Length x Width:

|                            |                           |
|----------------------------|---------------------------|
| 19x48 inch (488x1220 mm);  | 32x48 inch (812x1220 mm); |
| 48x16 inch (1220x406 mm);  | 48x24 inch (1220x610 mm); |
| 48x48 inch (1220x1220 mm); | 96x12 inch (2440x305 mm); |
| 96x16 inch (2440x406 mm);  | 96x24 inch (2440x610 mm); |
| 96x48 inch (2440x1220 mm)  |                           |

5. Dimensional tolerance:

max. 3/64 inch (1.0 mm) per 48 inch (1200 mm) long;  
max. 1/61 inch (0.5 mm) per 24 inch (600 mm) wide.

6. Unit weight:

Carrier Board: 2.02 lb/ft<sup>2</sup> (9.84 kg/m<sup>2</sup>)

Insulation Board: 0.52 lb/ft<sup>2</sup> (2.54 kg/m<sup>2</sup>) (1 inch (25.4mm) thick rock wool)

Backboard: 2mm: 0.53 lb/ft<sup>2</sup> (2.6 kg/m<sup>2</sup>); 3mm: 0.80 lb/ft<sup>2</sup> ( 3.9 kg/m<sup>2</sup>);

4mm: 1.07 lb/ft<sup>2</sup> (5.2 kg/m<sup>2</sup>); 6mm: 1.60 lb/ft<sup>2</sup> ( 7.8 kg/m<sup>2</sup>)

7. Material:

Carrier board (fiber-cement board) are manufactured from a pressed, stamped, and autoclaved mix of cement, quartz powder and wood fiber bundle.

The main raw material for insulation board (rock wool) is rock wool fiber and binder

Backboard (glass-fiber reinforced concrete membrane) is made of glass-fiber mesh and cement.

### B. Finish:

1. Finish texture:

Extra Coarse; Very Coarse; Coarse; Medium; Fine; Very Fine; Extra Fine

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2. Finish color:

Finish color selected by architect from manufacturer's color catalog.

C. Installation System:

1. Metal vertical panel supports:

Metal framing requirements to suit project needs, cannot have curved surface. It can be prefabricated as designed by architect.

2. Panel anchoring: LT anchoring system

- a. T-profile clip or L-profile clip
- b. B1 L-profile bracket or R1 T-profile rail
- c. A1 Adjuster
- d. Fastener
- e. Wallshell® LS surfactant applied on substrate and panel back surface.
- f. Wallshell® LM mortar applied on substrate and panel back surface.

3. Accessories:

- a. Sealant: Wallshell® SE edge sealant applied on panel edges being cut on-site and holes.  
Wallshell® SJ joint sealant applied on panel joint.
- b. Others: Insulation strip  
Weep Tube

## **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. Examine substrates for compliance with requirements for installation tolerances.
3. Prior to panel installation verify vertical panel support compliance with Design and Installation Manual.

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.



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- 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 manual and the approved set of shop drawings.
- B. Erect wall panel assembly level and true to the intended plane.
- C. Seal all the on-site cuts on the panels using manufacturer provided panel sealant.
- D. Installation Tolerance: Max tolerance of error 0.5‰ horizontally and 0.4‰ vertically.

### 3.4 CLEANING

- A. Remove panel masking immediately within 40 days 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