MATERIAL

1 GENERAL

1.1 SECTION INCLUDES

A. Exterior solid phenolic cladding panel system and accessories as required for a complete drained and back-ventilated rainscreen system.

1.1.1 Wall panels.
1.1.2 Fascia.
1.1.3 Horizontal soffits.
1.1.4 Storefront panels.

B. Interior solid phenolic cladding panel system and accessories.

1.2 RELATED SECTIONS

A. Section 05500 – Metal Fabrications; additional sub framing, Z girts to accommodate exterior insulation is not in the scope of Section 07420.

B. Section 07200 – Insulation; exterior insulation, if required for NFPA 285 or CAN/ULC-S134 compliance, is not included in the scope of Section 07420.

C. Section 08400 – Entrances and Storefronts.

D. Section 08910 – Glazed Curtain Walls.

E. Section 09250 – Gypsum Board.

1.3 REFERENCES

A. ASTM International (ASTM):

1.3.1 ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
1.3.2a ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
1.3.2b ASTM B 317 – Standard Specification for Aluminum-Alloy Extruded Bar, Rod, Pipe, Structural Profiles, and Profiles for Electrical Purposes
1.3.3 ASTM D 1929 – Standard Test Method for Ignition Temperature.
1.3.5 ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

1.3.6 ASTM D 5206-06a – Standard Test Method for Windload Resistance of Rigid Plastic Siding
1.3.6 ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
1.3.8 ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads.
1.3.9 ASTM E 662-97 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

B. European Standards (EN):

1.3.1 EN 438-6 – Decorative High Pressure Laminate (HPL) Sheets Based on Thermosetting Resins – Classification and Specification (≥2mm).
1.3.2 EN 13051-1 – Reaction to Fire Classification Procedure; Construction Projects, Flooring

C. International Organization for Standardization (ISO):

1.3.1a (EN) ISO 4892-2 – Plastics: Methods of exposure to Laboratory Light Sources (Xenon-arc)
1.3.1b (EN) ISO 4892-3 – Plastics: Methods of exposure to Laboratory Light Sources (Fluorescent UV)
1.3.2 (EN) ISO 178 – Determination of Flexural Properties.
1.3.3 (EN) ISO 527-2 – Determination of Tensile Properties.

D. National Fire Protection Association (NFPA):

1.3.1 NFPA 268 – Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
1.3.2 NFPA 258 – Recommended Practice for Determining Smoke Generation of Solid Materials
1.3.3 NFPA 259 – Standard Test Method for Potential Heat of Building Materials
1.3.2 NFPA 285 – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

E. Underwriters Laboratories of Canada, Inc. (ULC):

1.3.1 CAN/ULC-S134 – Standard Method of Fire Test of Exterior Wall Assemblies.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1.4.1 Preparation instructions and recommendations.
1.4.2 Storage and handling requirements and recommendations.

1.4.3 Installation methods.
Product Data: Manufacturer's written installation instructions for each product used, including: evaluation, preparation and substrate treating recommendations, rainscreen panel technical data, material descriptions and finishes, and tested physical performance properties.

C. Shop Drawings: Submit plan, section, elevation and perspective drawings necessary to describe and convey the layout, profiles and product components, including edge conditions, panel joints, fixture location, anchorage, accessories, finish colours, patterns and textures.
Shop Drawings: Show fabrication and installation layouts of solid phenolic exterior rainscreen panel(s), details and anchorages for aluminum support structures, attachment system for panels, allowances for thermal expansion, all trim/flashings/closures/corners/accessories required, and any other job-specific details.

D. Code Compliance: Documents showing product compliance with local building code shall be submitted prior to the bid. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product. Alternate materials must be approved by the architect of record prior to the bid date.

E. Engineering Calculations: Submit engineering calculations as required by the local building code, showing that the installed panels and attachments system meets the wind load requirements for the project.
Engineering Design Certification: From Manufacturer, certification of acceptance of final shop drawings and installer qualifications (must be provided before starting the Work).

Installer Qualification Data: Signed certification from Manufacturer indicating that the Installer(s) complies with requirements to perform specified job.

F. Samples: Prepared samples of size and type for each exposed finish representing actual product, colour, and pattern required:
1.4.1 Rainscreen Wall Panels: Minimum 4" x 4" including fasteners and any other accessories required. Sample edges may vary from field panel edges.
1.4.2 Aluminum Support Structure: 12", including fasteners and any other accessories. Samples demonstrating materials, colours and fastener attachment type are necessary.

G. Operation and Maintenance Data: Submit operation and maintenance manuals, including: methods for maintaining installed products, replacing damaged panels, cleaning materials precautions, and detrimental methods to finishes and performance.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary panels and auxiliary materials specified in this section will be supplied by a single manufacturer with a minimum of 10 years experience. Panels are manufactured in accordance to ISO 9001 and ISO 14001

B. Installer Qualifications: All products listed in this section are to be installed by a single installer trained and approved by the dealer/fabricator or representative.

C. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

D. Mock-up: Provide a mock-up for evaluation of the product and application workmanship.

1.5.1 Do not proceed with remaining work until workmanship, colour, and sheen are approved by Architect.

E. Pre-installation Meetings: Conduct pre-installation conference to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

F. Procurement of raw materials and intermediate products as per FSC and PEFC standards.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1.6.1 Ensure package is unopened, undamaged and with identification labels intact. During transportation, use stable, flat pallets that are at least the same dimension as the sheets.
1.6.2 Materials shall be packed to minimize or eliminate the possibility of damage during shipping. Items such as wooden side boards, wooden lid, and spacers or protective sheeting between panels shall be used to protect the panels from surface and/or edge damage.

B. Storage:

1.6.1 Store products in an enclosed area protected from direct sunlight, moisture and heat. Maintain a consistent temperature and humidity.
1.6.2 Store products in manufacturer's unopened packaging until ready for installation.
1.6.3 Stack panels using protective dividers to avoid damage to decorative surface.
1.6.4 For horizontal storage, store sheets on pallets of equal or greater size as the sheets with a protective layer between the pallet and sheet and on top of the uppermost sheet.
1.6.5 Do not store sheets, or fabricated panels vertically.

C. Handling:

1.6.1 Remove protective film within 24 hours of the panels being removed from the pallet.
1.6.2 When moving sheets, lift evenly to avoid dragging panels across each other and scratching the decorative surface.
1.6.3 Remove all labels and stickers immediately after installation.

1.7 PROJECT CONDITIONS

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

B. Field Measurements: Verify actual measurements/openings by field measurements performed by the installer prior to release for fabrication. Recorded measurements to be indicated on shop drawings based on field measurements provided by the installer. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.8 WARRANTY

A. FunderMax Panel Finish Warranty: At project closeout, provide manufacturer's limited ten year warranty covering defects in materials. Warranty only available when material installed by an installation contractor trained and approved by the manufacturer's representative.

B. Material and Workmanship Warranty: At project closeout, provide manufacturer's limited one year warranty covering defects or deficiencies from date of substantial completion.

2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: FunderMax GmbH, Klagenfurter Straße 87-89, 9300 St. Veit/Glan, Austria. Email: *office@fundermax.biz* Web: *www.fundermax.at*

B. Acceptable Manufacturer's Distributor: Modern Architectural Products, Inc.; 85 Burford Road, Hamilton, ON, L8E 3C6.

C. Acceptable FunderMax National Fabricator: Sobotec Ltd.; 67 Burford Road, Hamilton, ON, L8E 3C6, Canada. Tel: (905) 578-1278. Fax: (905) 578-1446. Web: *http://www.sobotec.com*. Contact: *dokraszewski@sobotec.com*.

D. Substitutions: Not permitted.

E. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 WALL PANELS

A. Solid Phenolic Wall Panels: FunderMax Exterior F-quality (Traditional Flat Panel) as represented by Modern Architectural Products, Inc.

2.2.1 Material: Solid panel manufactured in laminate presses under high pressure and temperature to create a flat panel. Weather protective coating is produced by double hardened acrylic polyurethane resins, homogenously reinformed with wood-based fibers and an integrated decorative surface or printed dècor, EN 438-6

2.2.2 Colour on Primary Face: _____ colour with sanded reverse
2.2.2.1 Panel Thickness: 2.0-2.9 mm ±0.2 (3/32 inch)
2.2.2.2 Panel Thickness: 3.0-4.0 mm ±0.3 (1/8 inch)

2.2.3 Colour on Primary and Reverse Faces: _____ colour on primary face and _____ colour on reverse face.

2.2.4 Colour: As selected by the Architect from manufacturer's standard colour palette.

2.2.5 Finish: NT (Standard).

2.2.6 Finish: NG (Gloss).

2.2.7 Finish: NH (Hexagon Pattern: Non-Slip).

2.2.8 Panel Core: F-quality, Fire retardant (FR) brown core.

2.2.9 Panel Thickness: 3/8 inch (10.0 mm ±*0.5*).

2.2.10 Panel Thickness: ½ inch (*12.0* – 13.0 mm ±*0.6*).

2.2.11 Panel Thickness: As indicated on the Drawings.

2.2.12 Physical Properties:
2.2.14.1 Modulus of Elasticity: 1,378,165 psi (9500 N/mm^2) minimum, EN ISO 178. (ES 438.2)
2.2.14.2 Tensile Strength: 11,603 psi (80 N/mm^2) minimum, EN ISO 527-2., (ES 438.2)
2.2.14.3 Flexural Strength: 13,053 psi (90 N/mm^2) minimum,EN ISO 178., (ES 438.2)
2.2.14.4 Thermal Conductivity: 2.1 BTU/inch/ft^2.hr.°F, NFPA 259
2.2.14.5 Structural Performance (ASTM E330):
2.2.14.5.1 Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 15 pounds per square foot (psf). Wind load testing shall be done in accordance with this standard to obtain the following results:
2.2.14.5.2 Normal to the plane of the wall, the maximum panel deflection shall not exceed L/175.

2.2.14.5.3 Normal to the plane of the wall between supports, deflection of the aluminum sub-framing members shall not exceed L/175 or ¾ inch, whichever is less

2.2.14.5.3.1 At 1-1/2 times design pressure, permanent deflection of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion.

2.2.14.5.4 If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory which show compliance to the minimum standards listed above.

2.2.13 Fire Performance:

2.2.15.1 Flame Spread: 10 (8-10mm), 5 (12mm), ASTM E84,

2.2.15.2 Smoke Development: 40 (8mm), 60 (10mm), 95 (12mm), ASTM E84.

2.2.15.3 Ignition Temperature: Greater than 650 degree F (350 degree C) above ambient, ASTM D1929.

2.2.15.4 Burning Classification: Class A, ASTM E84

2.2.15.6 When required for compliance with local building codes, the wall cladding assembly shall meet the performance requirements for Multi Story construction NFPA 285 or CAN/ULC-S134.

2.2.15.7 When required for compliance with local building codes, the wall cladding assembly shall not ignite when exposed to a radiant heat energy source, NFPA 268.

2.2.14 Finish Performance: In conformance with the following general requirements:

2.2.16.1 Colour: As selected by the architect/engineer from manufacturer's standard colours or a custom colour to be matched by the panel supplier.

2.2.16.2 Humidity Resistance: No formation of blisters when subjected to condensing water fog at 100% relative humidity and 100 degree F (38 degree C) for 3000 hours, ASTM D2247.

2.2.16.3 Salt Spray Resistance: Corrosion creepage from scribe line (1/16 inch (1.6 mm) max.) and minimum blister rating of 8 within the test specimen field, ASTM B117.

2.2.16.4 Colour Stability: The decorative surface complies with classification 4 – 5 measured with the grey scale according to EN ISO 4892-2 (Artificial Weathering, 3000 h) EN ISO 4892-3(UV light, 1500 h)

2.2.16.5 Hail Impact Resistance: 70mm ice ball at 30m/s velocity with no breakage, discolouration or tearing. Tested per Austrian APBIC Standard.

B. Mounting System:

2.2.1 FSL-200 – Concealed fastening over fixed depth aluminum sub-framing.
2.2.2 Other installation systems – Include test documentation showing compliance with the performance criteria set forth in the specification and in accordance with the local building code.

C. Aluminum Sub-Structure: Aluminum sub-structure designed to withstand loading due to wind load and the dead load of the panel, painted as required to conceal behind the open joinery of the attached system, ASTM B317.

2.2.1 Extrusions, including: corner closures, joint closures and vent screens, formed members, sheet, and plate shall conform with the recommendations of the Manufacturer and match the project Drawings.

D. Aluminum Trim: 0.040" (1mm) thick aluminum coil to be coated with Kynar finish. Colour: Black.

E. Fasteners (Concealed/Exposed): Fasteners shall be non-corrosive and as recommended by panel manufacturer. Exposed fasteners shall be coloured to match panels where required by the architect, ASTM B221

F. Panel Corner Conditions:
2.2.1 All corner conditions to use standard Fundermax National Fabricator system-detailing by use of square-cut corner conditions and/or mitered-connections.

2.3 FABRICATION

A. Panels: Solid phenolic impregnated kraft paper wall panels with no voids, air spaces or foamed insulation in the core material. Accessory items in accordance with manufacturer's recommendations and approved submittals.

B. Panel Weight: 8 mm (2.4 lb/ft^2), 10 mm (3 lb/ft^2), 12 mm (3.8 lb/ft^2).

C. Panel Bow: ≤ 2 mm/m (≤ 0.079 inch/39.38 inches).

C. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.

2.3.1 Production Sizes:
7' 1/8" x 3' 5 5/8" (24.43 sf), 2.137m x 1.057m (2.27 m^2)

E. Appearance: Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.

3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Surfaces to receive panels shall be even, smooth, dry, and free from defects detrimental to the installation of the panel system. Notify Contractor in writing of conditions detrimental to proper and timely completion of the work.

C. Confirm exterior sheathing is plumb and level, with no deflection greater than ¼ inch (6 mm) in 20 feet (6096 mm).

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install solid phenolic wall panels and sub-frame system in accordance with manufacturer's instructions.

B. Install solid phenolic wall panels plumb and level and accurately spaced in accordance with manufacturer's recommendations and approved submittals and drawings.

C. Anchor panels and sub-framing securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary movement and structural support.

D. Fasten solid phenolic wall panels with fasteners approved for use with supporting substrate.

E. Do not install panels or component parts which are observed to be defective or damaged including, but not limited to: warped, bowed, abraded, scratched and broken members.

F. Do not cut or trim component parts during installation in a manner that would damage the finish, decrease the strength or result in visual imperfection or a failure in performance. Return component parts with required alteration to the shop for re-fabrication or replacement.

G. Install corner conditions and trim with fasteners appropriate for use with adjoining construction as indicated on the Contract Drawings and as recommended by manufacturer.

3.3 ADJUSTING AND CLEANING

A. Remove masking or panel protection as soon as possible after installation. Any masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor to remove.

B. Adjust final panel installation so that all joints are true and even throughout the installation. Panels out of plane shall be adjusted with the surrounding panels to minimize any imperfection.

C. Repair panels with minor damage. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.

D. Clean finished surfaces as recommended by panel manufacturer. After installation cleaning, cleaning during construction shall become the responsibility of the General Contractor.

End of Section