
Part 1 GENERAL

1.1 GENERAL PROVISIONS

1. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

1. Work Included: The Work of this Section includes Fibre cement panels of the following types:
 1. Through color high density Fiber-C glass fiber reinforced concrete skin, large format panels by Rieder.
 - .1 Fiber-C is a through colored base board, with textured and colored finishes.
 2. Fixed with either
 - .1 Exterior: Rieder Concealed fastening with undercut anchor using concealed attachment with undercut anchor from Keil with setting depth 8.5mm. Screw length depending on substructure. Approval number: ETA-06/0220. Supplier undercut anchor: KEIL Befestigungstechnik GmbH,
or
 - .2 Exterior: Rieder Concealed fastening with RPA Rieder Power Anchor. Approval number: Z-31.4-166. Supplier RPA Rieder Power Anchor: Rieder Facades GmbH,
or
 - .3 Exterior: Concealed fastening by bonding with Sika Tack panel system. Concealed attachment by bonding with the SikaTack panel system from Sika on aluminium. Approval number: Z-10.8-408. Supplier Sika Tack panel system: www.sika.com.
 - .4 Interior: Concealed fastening by bonding with Sika Tack panel system. Concealed attachment by bonding with the SikaTack panel system from Sika on aluminium. Approval number: Z-10.8-408. Supplier Sika Tack panel system: www.sika.com.

1.3 RELATED WORK SPECIFIED ELSEWHERE

1. Carefully examine Contract Documents for requirements that affect work of this section.
2. Other specifications sections that directly relate to work of this section include, but are not limited to, the following:
 1. 04 20 00 Unit Masonry
 2. 05 12 00 Structural Steel Framing

3. 05 50 00 Metal Fabrications
4. 05 99 00 Miscellaneous Metal
5. 06 10 00 Rough Carpentry
6. 06 11 00 Wood Framing
7. Section 06 20 00 Finish Carpentry
8. Division 7 for: Exterior wall air and moisture barrier, thermal insulation.
9. Division 8 for: windows and openings

1.4 REFERENCES

1. ASTM International (ASTM):

1. ASTM C 1185 - 08 Standard Test Methods for Sampling and Testing Non-Asbestos Fibre-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
 2. ASTM C 1186 - 08 Standard Specification for Flat Fibre-Cement Sheets.
 3. ASTM E 84 - Surface Burning Characteristics of Building Materials.
 4. ASTM E 119 - 12a Standard Test Methods for Fire Tests of Building Construction and Materials
 5. ASTM E2226-12 Standard Practice for application of Hose Stream
 6. ASTM G 155-05a, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
 7. ASTM D 2244-09a, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
 8. AISI S905-08, Test Methods for Mechanically Fastened Cold-Formed Steel Connections
2. ICC-ES AC90, Acceptance Criteria for Fiber Cement Siding used as Exterior Wall Siding
 3. NFPA 285 – Standard fire test method for evaluation of fire propagation characteristics of exterior non-load-bearing wall assemblies containing combustible components
 4. ISO –
ISO 9001 Quality Management System
ISO 14001 Environmental Management System
OHSAS 18001 Safety Management System

1.5 SUBMITTALS

1. Products Submittals shall be per Section 01 33 00 – Submittal Procedures.
2. Product Data: Manufacturer's data sheets on each product to be used, including, but not limited to:
 1. Preparation instructions and recommendations for fiber-C glass fiber reinforced concrete skin, large format panels.
 2. Storage and handling requirements and recommendations.
 3. Installation methods for the supporting framework and the fiber-C glass fiber reinforced concrete skin, large format panels.

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3. Shop Drawings: Provide detailed drawings of fibre cement materials, substrates and attachment methods. Provide accurate pattern and design and detail sections with dimensions.
 4. Code Compliance: Documents showing product compliance with OBC 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.
 5. Engineering Calculations: Submit engineering calculations as required by the OBC, showing that the installed panels and attachment system meets the wind load requirements for the project.
 6. Selection Samples: For each finish product specified, two complete sets of 5 1/4" x 2 1/2" (160x65mm) color chips representing manufacturer's full range of colors and patterns shall be provided.
 7. Verification Samples: For each finish product specified, two samples, size 11 11/16" inches (305 mm) x 11 3/4" (297mm), representing actual product, color, and patterns.
 8. Operation and Maintenance Data: Submit operation, maintenance, and cleaning information for products covered under this section.

1.6 QUALITY ASSURANCE

1. Installer Qualifications: All products listed in this section are to be installed by a single installer trained and approved by the manufacture or representative.
2. Color Evaluation: No visible change, 2000 hours of accelerated weathering with color evaluation when calculated to ASTM D 2244-09a.
3. Mock-Up: Provide a full size mock-up minimum 1.2m by 1.2m for evaluation of surface preparation techniques and application workmanship. Mock-ups shall include a corner, window sill, jamb and head condition, wall base and wall-roof intersection.
 1. Finish areas designated by Architect.
 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

1.7 DELIVERY, STORAGE, AND HANDLING

1. Moving panels that are stacked on pallets should be done with a forklift with wide fork setting or a crane. Ensure the panels are secured to the pallet in a way that will not cause damage. Stacks should be transported under a waterproof cover.
2. All panel materials must be stored flat on pallets, inside and undercover in dry conditions, protected from weather both rain and direct sunlight and other trades. Stack the pallets in a way so that the panels are ventilated.

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3. Always lift panels off of each other, never slide them over one another, since scratching may occur.

1.8 PROJECT CONDITIONS

1. 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 or which could involve life safety situations.
2. Field Measurements: Verify actual measurements/openings by field measurements performed by the installer prior to release for fabrication. The General Contractor or Installer shall be responsible for existing site dimensions. Recorded measurements shall 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.

1.9 WARRANTY

1. Warranty: At project closeout, provide manufacturer's limited ten (10) year warranty covering defects in materials. Warranty is only available when material is installed by an installation contractor trained and approved by the manufacturer's representative.

Part 2 PRODUCTS

2.1 MANUFACTURER

1. As a basis of Design, Fibre Cement Panels shall be manufactured by:
Rieder Fiber-C
Supplier: Engineered Assemblies
6535 Millcreek Dr. Unit 75, Mississauga, ON L5N 2M2
Tel: [+1 866-591-7021](tel:+18665917021) E-mail: pgordon@engineeredassemblies.com
Web: <http://www.engineeredassemblies.com>.
2. Requests for substitutions will be considered in accordance with provisions of Section 01 50 00 Substitutions.

2.2 WALL PANELS

1. Through Color High Density Fibre Cement Panels:
 1. Product: Fiber-C glass fiber reinforced concrete skin, large format panels by Rieder.
 - .1 Application: Exterior.
 - .2 Application: Interior.
 - .3 Thickness: 5/16" (8 mm).
 - .4 Finish: A minimum of two colours and textures to be chosen from Greyscale colours and textures: Off White Fero Light, Silvergrey Fero is the preliminary selection. Final selection of greyscale colours and textures by

consultant based on submitted samples, and mock-ups. Final colour to be selected by Architect from the Manufacturer's full list of colours.

.5 Physical Characteristics:

EN 12467 'Fibre-cement flat sheets'.

Thickness tolerance EN 12467

Edge straightness (Level 1) $\pm 0,1$ % EN 12467

Perpendicularity (Level 1) $\pm 5/64$ " /m EN 12467

Swelling 0.384 mm/m DIN 18202

Shrinkage 0.737 mm/m

Bulk density (13 mm) 2.0 - 2.42 kg/dm³ EN 12467

Bending tensile strength > 18 N/mm² EN 12467, Class 4

E-modulus for deformation calculation approx. 10,000 N/mm² used approval

E-modulus for restraint calculation approx. 30,000 N/mm² used approval

Dead load / Mass per unit area (13 mm) 26 - 31.5 kg/m²

Thermal expansion coefficient 10×10^{-6} 1/K DIN 51045

Building material class (panel | system) A1-non-combustible | A2-s1,d0 - non-combustible EN 13501-1

Temperature stability according to humidity up to 350°

Specific heat capacity approx. 1000 Joule/(kg*K)

Thermal conductivity lambda: approx. 2.0 W/(m*K)

Moisture expansion 0.05 % EN 12467

Water impermeability yes EN 12467

Heat-rain-alternate test yes EN 12467

Frost resistance yes EN 12467

Frost-defrost-alternate test yes EN 12467

UV-light resistance light- and UV-stable colour pigments DIN 12878

Wet storage resistance yes; Efflorescence possible EN 12467

Hot water resistance yes EN 12467

ASTM C1185, ASTM C1186 Testing

ASTM C 1185 Section 5 Flexural Strength Modulus of Rupture - Pass Grade IV

ASTM C 1185 Section 6 Density

ASTM C 1185 Section 7 Dimensional Measurements

ASTM C 1185 Section 8 Moisture Movement

ASTM C 1185 Section 9 Water Absorption

ASTM C 1185 Section 10 Moisture Content

ASTM C 1185 Section 11 Water Tightness

ASTM C 1185 Section 12 Freeze/Thaw (Cladding Products)

ASTM C 1185 Section 13 Warm Water

2.3 MISCELLANEOUS CLADDING MATERIALS

1. Perforated Insect/Vermin Screen: Manufacturer's standard.

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2. Aluminum Joint Closures and Decorative Corner Profiles: Manufacturer's standard products as detailed. Maximum thickness of non structural finishing profile to be 0.8 mm or 21 gauge. Colour to match the Fiber C panel colour.

Part 3 EXECUTION

3.1 EXAMINATION

1. Do not begin installation until substrates have been properly prepared.
2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

1. Clean panel surfaces thoroughly prior to installation. Remove any cutting or drilling dust from the surface of the panel using a micro-soft cloth. This is especially important when panels are being adhesively fixed.
2. Prepare surfaces using the methods recommended by Equitone for achieving the best result for the substrate under the project conditions & verify coordinate installation and anchoring requirement to the existing substrate.

3.3 INSTALLATION

1. Install in accordance with manufacturer's instructions and approved submittals.
2. For exterior applications, comply with local codes and suppliers engineer's fastening calculations along with manufacturer's recommendations for fastener spacing on existing substrate.

3.4 EXTERIOR CLADDING FOR RAINSCREEN APPLICATIONS

1. Detailing Requirements:
 1. Air space inlets and outlets are required at top and bottom of building or wall termination and shall be equivalent to a continuous 1/2" to 3/4" (12 mm to 18 mm) to facilitate airflow behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow shall be continuous from bottom to top so there is air movement behind each panel. The minimum cavity width should be at least 25/32" (20mm) for facades up to 33' (10m) high. For facades between 66'-165' (20-50 m) the cavity width needs to increase to 1 3/16" (30mm). Air flow behind the fiber cement panels is critical to the performance of the rain screen constructions.
 2. Fasteners in profile shall accommodate thermal expansion/contraction of metal and not interfere with panel application.
 3. Install panels starting from top of building and work down the facade.
 4. For straight walls, start panel installation in center and work outward.
 5. For walls with inside corners, start installation at corner and work across wall.

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6. Pattern: Straight pattern with vertical panels. Panel size as indicated.
 7. Pattern: Straight pattern with horizontal panels. Panel size as indicated.
 8. Pattern: Semi pattern with horizontal panels. Panel size as indicated.

2. Rain Screen Installation: Comply with manufacturer's installation requirements.

3.5 PROTECTION

1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Completion.

End of Section 07 46 46