

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Conform to the requirements of Division 1 in addition to the requirements of this section.

1.2 DESCRIPTION OF WORK

- .1 This sub-trade is responsible for the supply and installation of the following items, including all related labour and materials necessary to successfully complete the installation of same whether or not on the Contract Documents.

- 1. Composite building panels
- 2. Fastening system
- 3. Closures and related trim
- 4. Caulking and sealants
- 5. Other related work as indicated on Drawings and Specifications.

1.3 QUALITY ASSURANCE

- .1 Manufacture's Qualification: 20 year minimum experience in Manufacturing Glass Fibre Reinforced Concrete Panels.
- .2 Execute the work of this section only by a Subcontractor meeting the following qualifications:
 - .1 Has adequate plant, equipment, and skilled workers to perform it expeditiously.
 - .2 Is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.
 - .3 Is certified by the system manufacturer for installation of their system. Submit written certification to Consultant prior to commencing the work of this section.
 - .4 Panel cladding installation: shall be applied by applicator trained and approved by manufacturer for application of its products
- .3 Provide a written guarantee covering the replacement of defective work for a period of one year from the expiry of the standard one year General Contractor's warranty.
- .4 The following will be deemed as defective work; leakage, failure to stay in place, undue

cracking, chipping or adjacent deformations, panel deformation, buckling, spalling, deterioration of surface. Failure of 15 % of surface area of panels shall be deemed a total failure of the installation requiring complete re-application of the panels.

1.4 SHOP DRAWINGS

- .1 Building panel shop drawings shall be submitted to the Consultant for review. No work shall be fabricated before review of shop drawings by the Consultant. Submit shop drawings in accordance with SECTION 01 33 00.
- .2 Indicate on the drawings all information required to fabricate and install components of the Section. This shall include product and material standards, dimensions, connection and jointing details, gauges, finishes, etc. ensure that plan and section details of interior and exterior corners, horizontal and vertical joints, fascias and soffits, cut-outs, misc. trim, fastening methods etc., are shown at a minimum 1:5 scale.

1.5 SAMPLES

- .1 Submit samples in accordance with SECTION 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 150mm x 150mm samples of wall panels, representative of finishes and colours.

PART 2: PRODUCTS

2.1 PANEL SYSTEM

- .1 The following specified products and materials form the complete building panel system required for this Project. Ensure that only compatible products and materials are used. Alternates may only be used if approved, in writing, by the Consultant.
- .2 Panels shall be exposed aggregate faced panels, and are to be face fastened. They shall consist of inorganic fibre with natural stone and cement.
- .3 Panels to have the following physical properties:
 - .1 Density: 2086 kg/m³
 - .2 Tensile Strength: ASTM D790, 22 MPa.
 - .3 Tensile modulus: ASTM D229, 600 N/mm²
 - .4 Flexural strength: ASTM D229, 50 MPa
 - .5 Flexural modulus: ASTM D790, 4137 N/mm²
 - .6 Edge Comp. strength: ASTM D790, 31 MPa
 - .7 Impact strength: ASTM D2794, 1371 Nmm/mm²
 - .8 Co-efficient of linear thermal expansion: ASTM D696, D696, 27×10^{-6}
 - .9 Thermal conductivity: 0.7 W/m/°C.
 - .10 Water vapour transmission: ASTM E96, 4.38 ng.Pa⁻¹s⁻¹m⁻¹
 - .11 Water absorption: ASTM D570, 4.5%
 - .12 Air Permeability: 1.46 ng.Pa⁻¹s⁻¹m⁻¹

- .4 Panels shall be fabricated in the factory to ensure that they are the same size, consistent in colour and free from warps, cracks and other imperfections. The panels shall be Synstone, Series#0, #1, #2 or #3 depending on location with a nominal overall thickness of 8mm (5/16"), 10mm (3/8") or 13mm (1/2") or as specified.
- .5 These panels shall be non-combustible when tested to ASTM E-136-81 (Also CAN4-S114M80)
- .6 Panels shall be glass fibre reinforced concrete Synstone panels as manufactured by Concrete Cladding Systems Ltd. 905-607-8304, supplied and installed as per the manufacturer's latest published data, and as noted on the Drawings and Specifications.
- .7 Panels are coloured through using synthetic iron oxide pigments, colour selected from manufacturer's full range
- .8 The concrete panel has been designed for a wind load of 25 psf. Based on the recommendation of the Prestressed Concrete Institute (PSI), a factor of Safety of 4 to 6 should be used for GFRC materials. A safety factor of 4 has been used in this design calculation.

2.2 STRUCTURAL SHAPES

- 18 Gauge and 16 Gauge galvanized brake shapes conforms to ASTM A653
 Coating designation: Metric Z275-275grams/m² both sides
 Imperial G90 - 90oz/ft² both sides
 Pre-painted brake shapes for light gauge trims galvanized substrate Z275/G90
 with Perspectra series paint by Dofasco.
 Bug Trim 26 Gauge Galvalume.

2.3 FASTENERS

- a – Concrete and brick masonry walls, use 3/16" Tapcon self-tapping concrete anchors, with minimum 1 1/2" minimum effective embedment or equivalent products.
- b – Steel and woods studs, use #8-18 Rock-on wafer head self-drilling screws from Buildex, or equivalent products.
- c – All screws should have sufficient corrosion resistance or be coated with Climaseal, or equivalent corrosion resistant products.
- d – The distance between fasteners both vertically and horizontally should not be more than 18" C.O.C. and also not less than 1/2" from the panel's edge. Care should be taken that the head of the screw does not penetrate the panel surface. Note that the head of the screw must be colour matched to the panel.

e – A joint gap of not less than 1/4" must be maintained between all panels. All joints should be filled with backing rod and caulking using a high quality sealant. Using specified sealant enables 3 point adhesion.

2.4 SEALANTS

Dow Corning 795 or CWS, one-part silicone, neutral-cure, architectural sealant or Bondaflex Sil 295 NB or Sil 199PG, one-part silicone neutral cure, architectural sealant. Colour as selected by the Architect from the manufacturer's chart

PART 3: EXECUTION

3.1 GENERAL

- .1 All panels are to be installed level, true and plumb and in line as indicated on the drawings. Tolerances shall be within 2 mm. in 3 meters vertically and horizontally, and 3 mm. in 3 meters for the diagonal surface alignment.
- .2 Panels required to be stored shall be protected from dirt and damage. Keep panels covered at all times to protect from dirty rain water until on the project. Panels which are damaged in any way shall not be accepted or installed.
- .3 Pre-drill exterior panels with #8 oversize, countersunk holes.
- .4 Screws are to be located so that panels can be individually removed without removing adjacent materials such as flashing.
- .5 To maintain 1/4" gaps between panels use "Synstone Black Shims" prior to fastening. Remove before caulking.
- .6 It is recommended that only installers approved by Synstone International Ltd. be allowed to install this system.

3.2 CLEAN UP

- .1 Clean all panels periodically during the process of reaching substantial completion with approved methods in accordance with manufactures recommendations. Dust from cutting and drilling holes in panels must be removed immediately. Do not use wire brushes, metallic tools or abrasives .
- .2 Upon completion of panel installation, remove any excess sealant with solvent approved or recommended by the panel manufacturer. Power wash the complete installation to remove construction dirt. No routine maintenance is required with Synstone panels. If required, the panels may be cleaned with mild detergent and water or plain water.