SECTION 03540

GLASSFIBRE REINFORCED CEMENT (GRC)

GENERAL

1.1 SECTION INCLUDES

1. Furnish all materials, labour, equipment and services necessary for the supply and installation of National Form G.R.C. Components as indicated on the drawings and contract documents, all in compliance with local codes and/or ordinances.

.2 Works shall include supply and installation.

1.2 RELATED SECTIONS

.1 Sections 09100: Metal Support Systems
.2 Sections 07920: Sealants and Caulkings
.3 Sections 09900: Painting

1.3 INTENT

.1 This specification is intended to generally outline the National Form G.R.C. requirements, as they pertain to the overall project design. In all cases, the manufacturer's printed specifications shall govern the work of this section.

1.4 RESPONSIBILITY

.1 The Gypsum Board or Carpentry Contractor shall install the work under this section and he will be responsible for co-ordinating the installation with other trades.

1.5 SUBMITTALS

.1 Submit a minimum of 3 – (7.6mm x7.6mm) (3" x 3") National Form G.R.C. flat samples to the finishing contractor for paint selection. Use only high-grade breathable exterior primer and paint.

.2 Submit shop drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relation of the National Form G.R.C. components to the surrounding construction.

1.6 MOCK-UP

.1 Prior to production erect one proto-type on-site or at the plant, for review by the architect. Once approved this proto-type will establish standards by which the work will be judged.

1.7 SUBSTITUTIONS

.1 Manufacturers desiring to submit proposals other than National Form shall, at least 10 days prior to the bid date, submit to the architect all descriptive information of the system. These manufacturers must have a minimum of five years experience with the system and provide photographs and shop drawings of at least three projects similar in detail and scope wit names, addresses and phone contacts of the respective architects and installation contractors. Independent test data showing compliance with the specified system and three samples of similar details must also be submitted.

PRODUCTS:

MANUFACTURER

.1 National Form Inc.
530 Keele St. Unit 310
Toronto, Ontario
M6N 3C9 Canada
Tel: (416) 604-2100 / 800-969-9202
Fax: (416) 604-2344
www.nationalform.com

2.2 MATERIALS

.1 National Form G.R.C. components shall be prefabricated with fast cast Cement, free of resin and asbestos, reinforced with chopped strand fiber.

.2 National Form G.R.C. components shall be suitable reinforced with galvanized steel.

.3 Fabrications will be as per approved shop drawings and will not include assembly. If multiple components are required to complete design criteria as per contract drawings, additional site work under related section, installation or finishing may be required.

.4 National Form G.R.C. components shall be ready to receive primer and paint as specified under Section 09900.

2.3 TOLERANCES (FABRICATION)

Dimensional –all directions	(3.2mm) (1/8”)
Thickness -skin	(1.6mm) (1/16”)
Thickness -total unit	(6.4mm-9.6mm) (¼”–3/8”)
Warpage or Bowing	(5.28mm/m) (1/16”/foot)
Out of Plane – unit to unit	(3.2mm) (1/8”)

Site conditions and normal manufacturing variations may require additional site work to maintain these tolerances.

2.4 PHYSICAL PROPERETIES

Shell Thickness		(9.6mm) (3/8")
Weight (depending on reinforcement)		(12.2-19.6 kg/sq. m.) (2-1/2 – 4 lbs/sq.ft.)
Density		(2120-2290 kg/sq. m.) (130 – 140 lbs/cu.ft.)
Compressive Strength	(ASTM C-109-92 MOD.)	(50.8 Mpa) (7,370 p.s.i.)
Flexural Strength	(ASTM C-947-89 MOD.)	(22.2 Mpa) (3220 p.s.i.)
Modulus of Elasticity – In flexure	(ASTM C-947-89 MOD.)	(18.88 Mpa) (2740 x 10^{-3} p.s.i.)
Tensile Strength	(ASTM D-638-94 b MOD.)	(7.58 Mpa) (1110 p.s.i.)
Impact Strength	(ASTM D-256-93a)	(425 J/m) (7.97 ft-lb/in)
Humified deflection	(ASTM C-473-95)	No Measurable Value
Screw withdrawal	(standard lab procedure)	(135.5 kg.) (298 lbs)
Fiber Content		5%–6% by weight

2.5 INSPECTION

The Architect or his representative shall have access to the manufacturing facilities, either prior to contract award or thereafter, to inspect or verify compliance with the above specifications.

3.0 EXECUTION:

3.1 PRE-INSTALLATION RESPONSIBILITY

.1 Field Measurements: Prior to manufacturing, the installer will be responsible for obtaining all field dimensions for inclusion on the manufacturers shop drawings.

.2 Co-ordinations: The installer will be responsible for the co-ordination of the installation with related sections, within the tolerances specified in the respective articles.

.3 Discrepancies: Prior to installation, the installer shall check job site dimensions and conditions. Any discrepancies between design and field dimensions shall be brought to the attention of the General Contractor and the Architect.

3.2 DELIVERY, STORAGE, HANDLING AND PROTECTION

.1 Transports and handle units in a manner that avoids excessive stresses or damage.

.2 Components displaying obvious damage must be rejected at site at time of delivery.

.3 Stores the components in a controlled environment, weather protected, on level surfaces, with temporary supports as required. Do not stack or lean.

3.3 INSTALLATION

.1 Components shall be lifted/handled with suitable devices.
.2 handle units with clean gloves.
.3 Components shall be installed plum and true. Shim where necessary.
.4 fasten components using galvanized or stainless steel screws only through face or back as indicated on shop drawings.
.5 Pre drill and countersink to 1/8" minimum below finished surface of unit.
.6 Where components are suspended, use as a minimum 12 gauge steel wire and suspension points Indicated on the shop drawings.
.7 Framing, hangers, etc. as specified elsewhere.
.8 Butt joints are to be caulked as specified for caulking – section 07920.

3.4 PATCHING AND CONTROL JOINTS

.1 Introduce control joints as required (10m) (35'-0") O.C. or as specified under related section of Specification.

.2 Patch countersunk fasteners and any damage to match component texture, using materials furnished by National Form. or the installer

3.5 FINISHING

.1 The paint contractor shall comply with the painting section of the specifications for exterior concrete. Use only high-grade breathable exterior primer and paint.

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