



SECTION 06600

FIBERGLASS REINFORCED PLASTIC (FRP)

GENERAL

1.1 SECTION INCLUDES

- .1 Provide special fiberglass reinforced plastic (FRP) shapes in accordance with the requirements of the contract documents.
- .2 The installing contractor shall be responsible for verifying that all required blocking is provided and installed in the correct locations for FRP components proper installation.

1.2 WORK INCLUDED

- .1 Supply of FRP units.
- .2 Erections / installation.
- .3 Joint treatments.
- .4 Supply and installation of backup supports, shimming, labor and materials.

1.3 RELATED SECTIONS

- .1 Masonry work.
- .2 Structural steel: Support framing for fiberglass components.
- .3 Rough carpentry.
- .4 Joint sealants.
- .5 Finishing: Paint manufacturer shall recommend paint suitable for FRP surfaces.

1.4 INSPECTION

- .1 The Architect or his representative shall have access to the manufacturing facilities, prior to contact awarded.

1.5 SUBMITTALS

- .1 Submit a minimum of 3 – (7.6cm x 7.6cm) (3” x 3”) National Form FRP flat samples to 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 FRP components to the surrounding construction.

1.6 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 with 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.

1.7 TOLERANCES - ERECTED UNITS

- .1 Face width of joint (3.2 mm.) (1/8")
- .2 Variations from plumb (in any dist. of 20' max.) (3.2 mm.) (1/8")
- .3 Variations from level (in any dist. of 20' max.) (3.2 mm.) (1/8")
- .4 Max. Differential between adjacent units in erected position (non-cumulative) (3.2 mm) (1/8")

1.8 PHYSICAL PROPERTIES

Flexural Strength	ASTM C – 947	(1682 Mpa) (244x10 ³ p.s.i.)
Impact Strength	ASTM D – 256	(854 J/m) (16 ft. lb./sq.in.)
Ultimate Tensile Strength	ASTM D – 638	(73 Mpa) (10,600 p.s.i.)
Young s Modulus	ASTM D – 638	(9.99 Mpa) (1,450 x 10 ³ psi)
Flexural Modulus	ASTM D – 790	(7.10 Mpa) (1,030x10 ³ p.s.i.)
Flame Spread Index	ASTM E – 84	Class 1 (<25 FSR)
Smoke Developed Index	ASTM E – 84	Class 1 (<375 FSR)
Shell Thickness		(3.2mm) (1/8") min.
Glass Content		25% by weight
Specific Gravity		1.7
Barcol Hardness		45-60
Impact Strength		(582 J/m) (10.9 ft. lb./ sq. in.)

1.9 DESCRIPTION OF WORK

- .1 This specification is intended to outline the general requirements of the National Form Inc. (FRP) units as they pertain to the overall design of the project. The manufacturers Recommendations shall not govern the work in this section.
- .2 The installing contractor shall perform all work in this section, including installation, caulking (filling) and patching and will assume responsibility for coordinating installation with the work and associated trades.

1.10 DESIGN CRITERIA

- .1 Unless otherwise stated on National Form's drawings, fabrication tolerances are as follow:
 - .1 Dimensional - all directions (0-3m) (0-10') (±3.2mm) (±1/8")
 - .2 Dimensional - all directions (3m-6m) (10'-20') (±4.8mm) (±3/16")
 - .3 Straightness along an edge or surface (±5.28mm/m) (±1/16"/linear ft.)
 - .4 All reveals, grooves, setbacks or returns 3° (draft minimum)
 - .5 All outside corners (1.6mm-3.2mm) (1/16"-1/8") radius

1.11 SAMPLES

- .1 Submit duplicate min. (7.6mm x 7.6mm) (3" x 3") FRP samples.

1.12 SHOP DRAWINGS

- .1 Submit for approval, shop drawings of units which show sections, details, joint treatment and the relation of the FRP units to adjoining components.

1.13 SCHEDULING

- .1 Special scheduling for site coordination must be specified at time of bidding.

1.14 DELIVERY, STORAGE AND HANDLING

- .1 Units shall be handled and transported per manufacturer s recommendation, in a manner so as not to create damage or excessive stresses.

- .2 FRP units shall be stored level on a clean dry surface in an area protected from weather, moisture and damage. The units shall not be stacked or leaned unless instructed otherwise by the manufacturer.
- .3 The installer is responsible for chipping, cracking, or other damage to fiberglass components, after delivery to the job-site and until installation is completed and inspected approved by the Owner s representative.

1.15 WARRANTY

- .1 The manufacturer warrants that the delivered material supplied will conform to sample and to specifications and will be free from defects in workmanship or material under normal use and conditions for a period of one year from date of shipment. Should defects, attributable to the manufacturer, appear within one year of the date of shipment, the manufacturer has the option of replacing or repairing the defective material.
- .2 Limitations: The aforementioned general warranty is exclusive. All other warranties whether expressed or implied or arising by operation of law, usage of trade, course of dealings or otherwise, are excluded. The only warranties are those expressed above. The manufacturer shall not be liable for any penalty or for any loss or damages associated with the removal or installation of its product or claims of third parties against the Purchaser.

2.0 PRODUCTS

2.1 MANUFACTURER

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 Show face shall be colored, ISO/NPG, ultra violet stabilized polyester gelcoat minimum thickness 15-20mil. Color to be matt white, ready for field painting.
- .2 Fiberglass reinforcement shall consist of glassfiber reinforced polyester composite with glass content and thickness to meet structural design. Additional stiffeners (as required) shall be encased in the fiberglass composite to ensure straightness and strength. If sandwich core constructed, flat surfaces equal to or greater than (30.5cm x 30.5cm) (12" x 12") or any running surface equal to or greater than (22.86cm) (9") in width, shall be fabricated with a minimum (6.4mm) (1/4") thick sandwich core.
- .3 Anchors and fasteners: Type 304 stainless steel where exposed; hot dip galvanized steel where unexposed.
- .4 Form stripping agent must be compatible with and for application of sealant and applied finishes.
- .5 Units will be suitably reinforced with additional materials (such as wood, metal, etc.) as required.
- .6 Caulk joints as required with Sonolastic Ultra, one-compound elastomeric sealant or equivalent low modulus urethane product. Do not use acrylic based products. Color of caulk to be selected by Architect.

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 PREPARATION

- .1 Examine the contract drawings and specifications in order to ensure the Completeness of the work required under this section.
- .2 Verify measurements and dimensions at the job-site and cooperate in the Coordination and scheduling of the work of this section with the work of related Trades, so as not to delay job progress.

3.4 INSTALLATION

- .1 Install work as indicated on drawings, as specified herein and in accordance with Approved shop drawings and manufacturer s recommendations.
- .2 Provide all support framing/reinforcing/support brackets required for work of this Section and to ensure solid and secure installation.
- .3 Provide temporary supports to maintain position as units are being installed.
- .4 FRP units shall be handled with care and lifted with appropriate equipment.
- .5 Caulk or fill and sand joints as required. Control joints shall be provided where required as specified by Architect.
- .6 Expansion joints shall be installed as per Architect s recommendation.
- .7 FRP components shall be lifted / handled with suitable devices.
- .8 Handle units with clean gloves.
- .9 FRP components shall be installed plum and true. Shim where necessary.

3.5 PATCHING AND CLEANING

- .1 Repair any defects found after the work of all trades has been completed, Regardless of how, or by whom, the damage was caused. Patching shall match the Original work.
- .2 Patch all countersunk fasteners and damages to match unit s texture, finished flush with face of unit.

3.6 FINISHING

- 3.7** .1 References shall be made to the painting/texturing section of the specifications.

Revision 2 05/03/2006