

Artificial Turf Solution - The Bison Artificial Turf Solution, developed in collaboration with Fibergrate Composite Structures, provides a durable, modular base platform compatible with most artificial turf brands. Engineered for superior drainage and structural protection, this easy-to-install pedestal and grating solution supports green rooftop designs. Ideal for public and private outdoor spaces, it delivers reliable performance, thermal insulation, and a comfortable, slip-resistant surface enhancing rooftop usability with long-lasting support.

Molded Grating & Pultruded Fiberglass Structural Shape Specification

SECTION 06610 – Fiberglass Reinforced Plastics (FRP) Fabrications

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The CONTRACTOR shall furnish, fabricate (where necessary), and install all fiberglass reinforced plastic (FRP) items, with all appurtenances, accessories and incidentals necessary to produce a complete, operable and serviceable installation as shown on the Contract Drawings and as specified herein, and in accordance with the requirements of the Contract Documents.

1.2 REFERENCES

- A. The publications listed below (latest revision applicable) form a part of this specification to the extent referenced herein. The publications are referred to within the text by the designation only.
 - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) Test Methods:
 - ASTM D635 – Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
 - ASTM D638 – Tensile Properties of Plastics
 - ASTM D696 – Coefficient of Linear Thermal Expansion for Plastics
 - ASTM D790 – Flexural Properties of Unreinforced and Reinforced Plastics
 - ASTM D2344 – Apparent Interlaminar Shear Strength of Parallel Fiber Composites by Short Beam Method
 - ASTM E84 – Surface Burning Characteristics of Building Materials

1.3 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall furnish manufacturer's shop drawings detailing the installation methods.
- B. The CONTRACTOR shall submit the manufacturer's published literature including structural design data, structural properties data, grating load/deflection tables, corrosion resistance tables, certificates of compliance, test reports as applicable, concrete anchor systems and their allowable load tables, and design calculations for systems not sized or designed in the contract documents.
- C. The CONTRACTOR may be requested to submit sample pieces of each item specified herein for acceptance by the ENGINEER as to quality and color. Sample pieces shall be manufactured by the method to be used in the WORK.

1.4 QUALITY ASSURANCE

- A. All items to be provided under this Section shall be furnished only by manufacturers having a minimum of ten (10) years experience in the design and manufacture of similar products and systems. Additionally, if requested, a record of at least five (5) previous, separate, similar successful installations in the last five (5) years shall be provided.
- B. Manufacturer shall offer a 3 year limited warranty on all FRP products against defects in materials and workmanship. See Fibergrate Composite Structures warranty.
- C. Manufacturer shall be certified to the ISO 9001-2015 standard.
- D. Manufacturer shall provide proof of certification from at least two other quality assurance programs for its facilities or products (DNV, ABS, USCG, AARR).
- E. Manufacturer shall provide proof, via independent testing, that materials proposed as a solution do not contain heavy metals in amounts greater than that allowed by current EPA requirements.

1.5 PRODUCT DELIVERY AND STORAGE

- A. Delivery of Materials: Manufactured materials shall be delivered in original, unbroken pallets, packages, containers, or bundles bearing the label of the manufacturer. Adhesives, resins and their catalysts and hardeners shall be crated or boxed separately and noted as such to facilitate their movement to a dry indoor storage facility.
- B. Storage of Products: All materials shall be carefully handled to prevent them from abrasion, cracking, chipping, twisting, other deformations, and other types of damage. Adhesives, resins and their catalysts are to be stored in dry indoor storage facilities between 70 and 85 degrees Fahrenheit (21 to 29 degrees Celsius) until they are required.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Molded gratings shall be Fibergrate® and Structural shapes shall be Dynaform® as manufactured by:
Fibergrate Composite Structures Inc.
1234 Johnson Rd, Suite 366 Allen, Texas 75013 USA
(800) 527-4043 Phone (972) 250-1530 Fax
Website: www.fibergrate.com E-mail: info@fibergrate.com

2.2 GENERAL

- A. All FRP items furnished under this Section shall be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified in the Contract Documents.
- B. All structural shapes ~~are~~ to be manufactured by the pultrusion process with a glass content minimum of 65% by weight. The structural shapes shall be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified in the Contract Documents.
- C. Fiberglass reinforcement shall be continuous roving, and/or continuous strand mat, and surfacing veil in sufficient quantities as needed by the application and/or physical properties required.

- D. Molded Grating Resin shall be Corvex, with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required.
- E. Pultruded Structural Shape Resins shall be DYNAFORM® ISOFR, fire retardant isophthalic polyester, with chemical formulation necessary to provide the corrosion resistance, strength and other physical properties as required.
- F. All finished surfaces of FRP items and fabrications shall be smooth, resin-rich, free of voids and without dry spots, cracks, crazes or unreinforced areas. All glass fibers shall be well covered with resin to protect against their exposure due to wear or weathering.
- G. All pultruded structural shapes shall be further protected from ultraviolet (UV) attack with 1) integral UV inhibitors in the resin and 2) a synthetic surfacing veil to produce a resin rich surface.
- H. All fire-retardant molded grating products shall have a tested flame spread rating of 25 or less per ASTM E-84 Tunnel Test. Gratings shall not burn past the 25 mm reference mark and will be classified HB per ASTM D635.
- I. All mechanical grating clips shall be manufactured of Type 316SS (stainless steel).

2.3 MOLDED FRP GRATING

- A. Manufacture: Grating shall be of a one piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane. Grating shall have a square mesh pattern providing bidirectional strength. Grating shall be reinforced with continuous rovings of equal number of layers in each direction. The top layer of reinforcement shall be no more than 1/8" below the top surface of the grating so as to provide maximum stiffness and prevent resin chipping of unreinforced surfaces. Percentage of glass (by weight) shall not exceed 35% so as to achieve maximum corrosion resistance, and as required to maintain the structural requirements of the CONTRACT. After molding, no dry glass fibers shall be visible on any surface of bearing bars or cross bars. All bars shall be smooth and uniform with no evidence of fiber orientation irregularities, interlaminar voids, porosity, resin rich or resin starved areas.
- B. Grating shall be manufactured with a concave, meniscus profile on the top of each bar providing maximum slip resistance.
- C. Grating bar intersections are to be filleted to a minimum radius of 1/16" to eliminate local stress concentrations and the possibility of resin cracking at these locations. For Micro-Mesh Grating, bar intersections of full depth bars are to be filleted to a minimum radius of 1/16" to eliminate local stress concentrations and the possibility of resin cracking at these locations. Intersections of secondary, partial depth bars do not require a fillet.
- D. Fire rating: Grating shall be fire retardant with a tested flame spread rating of 25 or less when tested in accordance with ASTM E 84. Certifications shall be dated within the past two years and data performed only on the resin shall not be acceptable.
- E. Resin system: The resin system used in the manufacture of the grating shall be Corvex.
- F. Manufacturer may be required to submit corrosion data from tests performed on actual grating products in standard chemical environments. Corrosion resistance data of the base resin from the manufacturer is not a true indicator of grating product corrosion resistance and shall not be accepted.
- G. Color: Dark Gray
- H. Depth: 1-1/2" with a tolerance of plus or minus 1/16".

- I. Micro-Mesh Configuration: 1-1/2" square mesh bottom, 3/4" square mesh top, with a tolerance of plus or minus 1/16" mesh centerline to centerline. Top surface meets ADA requirements. Panels shall be 22-5/8" x 70-5/8".
- J. Square Mesh Configuration: 1-1/2" x 1-1/2" with a tolerance of plus or minus 1/16" mesh centerline to centerline.
- K. Load/Deflection: Grating design loads shall be less than manufacturers published maximum recommended loads. Maximum recommended loads shall be determined by acoustic emission testing. Grating shall be designed for a uniform load of 100 psf or concentrated load of 300 lb. Deflection is not to exceed L/360.
- L. Load/Deflection: Load and Deflection capability of grating shall be equal to that of the open mesh 1-1/2" deep, 1-1/2" square mesh molded grating.
- M. The manufacturer shall certify that the stiffness of all panels manufactured are never more than 2.5% below the published load-deflection values.
- N. Substitutions: Other products of equal strength, stiffness, corrosion resistance and overall quality may be submitted with the proper supporting data to the engineer for approval.

2.4 PULTRUDED STRUCTURAL SHAPES

- A. All shapes are to have the minimum longitudinal mechanical properties listed below:
 - o Property ASTM Method Value Units:
 - Tensile Strength D-638 30,000 (206) psi (MPa)
 - Tensile Modulus D-638 2.5 x 10⁶ (17.2) psi (GPa)
 - Flexural Strength D-790 30,000 (206) psi (MPa)
 - Flexural Modulus D-790 1.8 x 10⁶ (12.4) psi (GPa)
 - Short Beam Shear (Transverse) D-2344 4,500 (31) psi (MPa)
 - Coefficient of Thermal Expansion D-696 4.4 x 10⁻⁶ (8.0 x 10⁻⁶) in/in/°F (cm/cm/°C)

2.5 FIELD INSTALLATION

- A. Measurements: Grating and Structural Shapes supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field.
- B. Sealing: All shop fabricated grating cuts shall be coated with spray sealer as per manufacturers recommendations.
- C. Hardware: Type 316 stainless steel hold-down clips and screws shall be provided and spaced as recommended by the manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Shop inspection is authorized as required by the Owner and shall be at Owner's expense. The fabricator shall give ample notice to Contractor prior to the beginning of any fabrication work so that inspection may be provided. The grating shall be as free, as commercially possible, from visual defects such as foreign inclusions, delamination, blisters, resin burns, air bubbles and pits. The surface shall have a smooth finish (except for grit top surfaces).



3.2 INSTALLATION

- A. Contractor shall install gratings in accordance with manufacturer's shop drawings. Fasten grating panels securely in place with hold-down fasteners as specified herein. Field cut and drill fiberglass reinforced plastic products with carbide or diamond tipped bits and blades. Seal cut or drilled surfaces in accordance with manufacturer's instructions. Follow manufacturer's instructions when cutting or drilling fiberglass products or using resin products; provide adequate ventilation.