

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Refer to Drawing 512534-0001-D-CI-DWG-0003-01.

1.2 REFERENCES

- .1 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) Test Methods:
 - .1 ASTM D 635 Rate of Burning and/or Extent and Time of Burning of Self Supporting Plastics in a Horizontal Position
 - .2 ASTM E 84 Surface Burning Characteristics of Building Materials
 - .3 NSF/ANSI STANDARD 61
- .2 American Water Works Association (AWWA).
 - .1 ANSI/AWWA D120-09 - THERMOSETTING FIBERGLASS-REINFORCED PLASTIC TANKS.

1.3 GENERAL DESCRIPTION OF WORK BEING PERFORMED

- .1 The present section describes the fiberglass grating to be installed inside the curbed area of the degasser building. This grating is to be installed on rubber feet, described herein. The fiberglass grating is to be installed in such a way as to ensure it is of rugged construction for people to stand on.

1.4 SUBMITTALS

- .1 The Contractor shall furnish shop drawings of all fabricated gratings and accessories in accordance with the provisions of this Section.
- .2 The Contractor shall furnish manufacturer's shop drawings clearly showing material sizes, types, styles, part or catalog numbers, complete details for the fabrication and erection of components including, but not limited to, location, lengths, type and sizes of fasteners, clip angles, member sizes, and connection details.
- .3 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.

- .4 The Contractor may be requested to submit sample pieces of each item specified herein for acceptance by the DCC Representative as to quality and color. Sample pieces shall be manufactured by the method to be used in the Work.

1.5 QUALITY ASSURANCE

- .1 All items to be provided under this Section shall be furnished only by manufacturers having experience in the design and manufacture of similar products and systems.
- .2 Manufacturer shall offer a 3 year limited warranty on all FRP products against defects in materials and workmanship.
- .3 Manufacturer shall be certified to the ISO 9001-2000 standard.
- .4 Manufacturer shall provide proof of certification from at least two other quality assurance programs for its facilities or products (UL, DNV, ABS, USCG, AARR).
- .5 Manufacturer shall provide proof, via independent testing less than six months old, that materials proposed as a solution do not contain heavy metals in amounts greater than that allowed by current EPA requirements.

1.6 PRODUCT DELIVERY AND STORAGE

- .1 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.
- .2 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.

1.7 IN-SHOP REVIEW

- .1 Provide all completed components in one location and allow DCC Representative to review all components that will be installed within the Reservoir.
- .2 Provide minimum 1 week notice for in-shop review of completed fabricated

construction.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 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.
- .2 All items shall be constructed of materials that meet governing provincial and local regulations for potable water certification, including Health Canada Guidelines for Canadian Drinking Water Quality. Items specified for potable water service shall be certified as suitable by a testing laboratory acceptable to DCC Representative.
- .3 Fiberglass reinforcement shall be continuous roving in sufficient quantities as needed by the application and/or physical properties required.
- .4 Resin shall be a commercial-grade, thermosetting plastic used to produce NSF Standard 61 certified grating, with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required. Resin shall be evaluated in a laminate by test in accordance with ANSI/AWWA D120-09. The resin shall not contain fillers or pigments except as specified in Section 4 of ANSI/AWWA D120-09.
- .5 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.
- .6 All grating products shall have a tested flame spread rating of 25 or less per ASTM E 84 Tunnel Test. Gratings shall also have tested burn time of less than 30 seconds and an extent of burn rate of less than or equal to 10 millimeters per ASTM D635.
- .7 All grating products shall be certified to NSF/ANSI Standard 61.
- .8 All mechanical grating clips shall be manufactured of Type 316SS (stainless steel).

2.2 MOLDED FRP GRATING

- .1 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 3.175 mm 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.
 - .1 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.
- .2 Non-slip surfacing: Grating shall be manufactured with a concave, meniscus profile on the top of each bar providing maximum slip resistance.
- .3 Grating bar intersections are to be filleted to a minimum radius of 1.5875 mm to eliminate local stress concentrations and the possibility of resin cracking at these locations.
- .4 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. Data performed only on the resin shall not be acceptable.
- .5 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. IFR products shall be U.L. listed if available for the grid configuration and surface specified.
- .6 G. Depth: 38 mm with a tolerance of plus or minus 1.5875 mm.
- .7 H. Mesh Configuration: 38 mm x 38 mm with a tolerance of plus or minus 1.5875 mm mesh centerline to centerline.
- .8 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 4.8 kPa. Deflection is not to exceed 9.5 mm or $L/D = 120$, whichever is less.
- .9 The manufacturer shall certify that the stiffness of all panels manufactured are never more than 2.5% below the published load-deflection values.

2.3 GRATING FABRICATION

- .1 Measurements: Grating supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work. When field dimensions are not required, contractor shall determine correct size and locations of required holes or cutouts from field dimensions before grating fabrication.
- .2 Layout: Each grating section shall be readily removable, except where indicated on drawings. Manufacturer to provide openings and holes where located on the contract drawings. Grating openings which fit around protrusions (pipes, cables, machinery, etc.) shall be discontinuous at approximately the centerline of opening so each section of grating is readily removable.
- .3 Sealing: All shop fabricated grating cuts shall be coated with vinyl ester resin to provide maximum corrosion resistance. All field fabricated grating cuts shall be coated similarly by the contractor in accordance with the manufacturer's instructions.
- .4 Hardware: Type 316 stainless steel hold down clips shall be provided and spaced at maximum of four feet apart with a minimum of four per piece of grating, or as recommended by the manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Contractor shall install gratings in accordance with manufacturer's assembly 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.
- .3 Grating panels shall be installed with rubber feet from same supplier so as to elevate the grate by 13 mm from the floor.
- .2 Grating shall be cut so as to be aesthetically appealing where it meets the circular degassing units.

- .3 Grating shall be installed in such a way as to be rugged, and also easily removable.