

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI Z97.1-2015, Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
- .2 ASTM International
 - .1 ASTM A276/A276M-17, Stainless Steel Bars and Shapes.
 - .2 ASTM A480/A480M-16, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
 - .3 ASTM C1184-18e1, Standard Specification for Structural Silicone Sealants.
 - .4 ASTM D412-16 (2021), Vulcanized Rubber and Thermoplastic Elastomers—Tension.
 - .5 ASTM D570-98 (2018), Water Absorption of Plastics.
 - .6 ASTM D624-00 (2020), Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - .7 ASTM D2240-15e1, Rubber Property—Durometer Hardness.
 - .8 ASTM D2794-93 (2019), Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - .9 ASTM D4060-19, Abrasion Resistance of Organic Coatings by the Taber Abraser.
 - .10 ASTM E96/E96M-13, Water Vapor Transmission of Materials.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 12.1-2017, Safety Glazing.
- .4 NSF International
 - .1 NSF/ANSI 61-2016, Drinking Water System Components – Health Effects.
 - .2 NSF/ANSI/CAN 600-2019, Health Effects Evaluation and Criteria for Chemicals in Drinking Water.
- .5 ULC (Underwriters Laboratories of Canada)
 - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
- .6 United States Consumer Product Safety Commission (CPSC)
 - .1 CPSC 16CFR1201 – Safety Standard for Architectural Glazing Materials.
- .7 United States Food and Drug Administration (FDA)
 - .1 21 CFR 175.300 – Resinous and Polymeric Coatings.

1.2 GENERAL INSTRUCTIONS

- .1 Engage with a Specialist Contractor familiar with tank and/or pool design and construction and coordinate with other trades having related work in this Section.
- .2 Execute work of this Section using a Specialist Contractor with experience in coordination and application of products, systems and assemblies specified, and illustrated. Work shall be performed using skilled trades experienced in Work of this complexity.
- .3 Specialist Contractor shall provide review of the proposed design. Specialist Contractor shall advise Departmental Representative of omissions, conflicts, and variations, and propose revisions to meet the design intent.
- .4 Forces and services engaged for other portions of building renovation may be used as required to facilitate requirements set out within this specification (e.g. concrete work, electrical work). All Work must be overseen and deemed acceptable by the Contractor and Specialist Contractor.
- .5 Be responsible to include and complete items required for ballast tank and its operation to the Departmental Representative's satisfaction in compliance with the Contract Documents and with Provincial, Municipal and local requirements, regulations, codes, and by-laws in force having jurisdiction in the area of the project.

1.3 CO-ORDINATION AND PRE-CONSTRUCTION MEETING

- .1 Initiate ballast tank co-ordination and pre-construction meeting at least 30 days prior to commencement of any work relating to the construction of the ballast tank or manufacturing of related products/equipment, to review systems, design, proposed materials, schedule of work, proposed methods of installation, protection requirements, and testing procedures, with the following in attendance:
 - .1 Departmental Representative.
 - .2 Contractor.
 - .3 Specialist Contractor.
 - .4 Reinforcing steel contractor.
 - .5 Concrete supplier.
 - .6 Concrete formwork and finishing supervisor.
 - .7 Steel Fabricator.
 - .8 Consultant and structural, mechanical and electrical sub consultants.
 - .9 Coatings installer (if applicable).
 - .10 Mechanical Contractor.
 - .11 Electrical Contractor.
 - .12 FRP Supplier.
 - .13 Cover Supplier.

1.4 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturers' printed product literature, specifications, and datasheets. Include product characteristics, performance criteria, physical size, finishes, and limitations.
 - .2 Submit WHMIS SDS - Safety Data Sheets in accordance with Section 01 35 29.06 – Health and Safety Requirements.
 - .3 Provide data on equipment, utility characteristics, and accessories.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineers registered or licensed in Province of Nova Scotia.
 - .2 Include structural design data, structural properties data, corrosion resistance tables, certificates of compliance, test reports as applicable, and design calculations for systems not sized or designed in the contract documents, including:
 - .1 Fibreglass platforms, stairs, ladders, railing and grating system.
 - .2 Concrete and reinforcement.
 - .3 Glass and glazing installation.
 - .3 Show material sizes, types, styles, part or catalog numbers, details for fabrication of and erection of components including, but not limited to, location, lengths, type and sizes of fasteners, clip angles, member sizes, and connection details.
 - .4 Indicate layout, equipment locations, dimensions, details of assembly, anchors, and utility rough-in locations.
- .4 Interference and Co-ordination Drawings:
 - .1 Prepare interference and equipment placing drawings to ensure that components will be properly accommodated within the constructed spaces provided.
 - .2 Prepare drawings to indicate co-ordination and methods of installation of a system with other systems where their relationship is critical. Ensure that details of equipment apparatus and connections are co-ordinated.
 - .3 Upon Departmental Representatives's request, submit copies of interference drawings.
 - .4 Indicate clearances required by jurisdictional authorities and clearances for proper maintenance.
 - .5 Due to the nature of the building and the complexity of the building systems provide the following:
 - .1 Interference drawings, showing coordination of architectural, structural, mechanical and electrical systems for review prior to fabrication.
 - .2 Detailed layout drawings, clearly showing fasteners and hangers.

RENOVATION

- .3 Submit CAD drawings (minimum release AutoCAD 2010) and PDF copies.

.5 Samples:

- .1 Submit duplicate manufacturer samples of fibreglass railings and gratings.
- .2 Submit duplicate manufacturer samples of glazing, minimum 100 x 100 mm in size.
- .3 Submit duplicate manufacturer samples of vinyl for ballast tank cover, minimum 100 x 100 mm in size.
- .4 Submit duplicate manufacturer samples of tank surface coating, minimum 100 x 100 mm in size.

1.5 QUALITY ASSURANCE

- .1 Design ballast tank structural components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the Project location.

1.6 CLOSEOUT SUBMITTALS

- .1 Closeout Submittals: Provide operation and maintenance data for ballast tank and equipment for incorporation into O&M manual specified in Section 01 78 00 - Closeout Submittals.
 - .1 Provide detailed instructions for erection, use, dismantlement, and maintenance.
 - .2 Describe cleaning procedures for finishes, maintenance for electrical and mechanical components.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver materials to site in original packaging, labelled with manufacturer's name and product identification.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect products from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 BALLAST TANK

- .1 Tank Construction: Cast-in-place concrete, configured to dimensions and forms as indicated. Refer to Structural Division 03 sections:

RENOVATION

- .1 Section 03 10 00 – Concrete Formwork.
- .2 Section 03 20 00 – Concrete Reinforcement.
- .3 Section 03 30 00 – Cast-in-Place Concrete.

2.2 TANK SURFACE COATING

- .1 Hybrid polyurethane, multi-component, 100% solids, spray applied, intended for use in saltwater immersion, complying with:
 - .1 NSF/ANSI 61.
 - .2 NSF/ANSI/CAN 600.
 - .3 21 CFR 175.300.
- .2 Coating thickness: 3175 microns (0.125 inch) dry film thickness (DFT).
- .3 Colour: Grey.
- .4 Typical physical properties:
 - .1 Impact resistance (ASTM D2794): 160 in-lbs.
 - .2 Tear strength (ASTM D624): 347 pli.
 - .3 Abrasion resistance (ASTM D4060): 37 mg loss.
 - .4 Shore D hardness (ASTM D2240): 60-65.
 - .5 Tensile strength (ASTM D412): 2000 to 3000 psi, 90 – 110%.
 - .6 Water absorption long method (ASTM D570): < 0.7%.
 - .7 Water vapour permeance (ASTM E96): 0.23 perms.

2.3 RAILINGS AND GRATING

- .1 Provide modular system of railings and grating of fibreglass reinforced plastic resin (FRP), complete with fittings and hardware for complete installation.
 - .1 Fabricate grating and structural sections that are readily removable for quick removal and installation.
 - .2 Load/Deflection: Grating design loads shall be less than manufacturers published maximum recommended loads. Design grating for uniform load of 4.8 kPa or concentrated load of 1.4 kN. Deflection maximum 5 mm or L/D = 240, whichever is less.
- .2 FRP: continuous roving glass content 45 to 55%, smooth finish, free of voids, dry spots, cracks, crazes, and unreinforced areas; NSF 61 certified.
 - .1 Structural members: Pultruded FRP.
 - .2 Grating: Moulded or pultruded FRP.
 - .1 Walking surface: Non-slip when wet.
- .3 Connectors, hold-down clips, and other hardware: Type 316 stainless steel.
- .4 Dress shop and field fabrication cuts with manufacturer's recommended resin to provide maximum corrosion resistance.

RENOVATION

- .5 Anchor/Lift points: Provide engineered integrated lift points for use by single lift point overhead and jib cranes.

- .6 Labeling: Stencil-apply rated capacity on both exposed long sides, 50 mm high font.

2.4 GLAZING

- .1 Design and provide glass and glazing capable of withstanding imposed loads.

- .2 Safety glass: To CAN/CGSB 12.1.

- .1 Type: Laminated, glass/polycarbonate/glass construction.

- .2 Impact safety rating: ANSI Z97.1 and CPSC 16CFR1201 CAT I and II.

- .3 Sealants: Silicone base, capable of continuous saltwater submersion, NSF 61 compliant.

2.5 BALLAST TANK COVER

- .1 Foam core with cover and fastening strips and edges for cover system capable of multiple configurations.

- .1 Foam core: Polystyrene insulation to CAN/ULC S701.

- .2 Cover for core: Marine grade vinyl, 30 oz/linear yard, polyester knit backing, 1 mm thick.

- .1 Colour: As selected by Departmental Representative.

- .3 Fastening strips and flaps: Hook and loop strips, heavy duty, sewn on to cover.

2.6 PROTECTION ANGLE

- .1 Stainless steel to ASTM A276/A276M or ASTM A480/A480M, Type 316.

- .2 Deburr and remove sharp edges.

- .3 Attachment: Stainless steel screws with finishing washers.

2.7 HARDWARE

- .1 Hardware: Type 316 stainless steel.

2.8 LIGHTING

- .1 Refer to Electrical Divisions.

2.9 EQUIPMENT

- .1 Refer to Mechanical and Electrical Divisions.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify conditions of substrates are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Verify that field measurements are as indicated.
- .3 Verify that surfaces are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- .1 Construct framing, finishing, and install components in accordance with Drawings.
- .2 Construct assembly level and plumb.
- .3 Carefully cut holes for mechanical and electrical components.
- .4 Coordinate installation of mechanical and electrical components; connect to utilities.

3.3 FIELD QUALITY CONTROL

- .1 Section 01 45 00: Quality Control.
- .2 Perform leak testing by 24 hour bucket test.

3.4 CLEANING

- .1 Cleaning: in accordance with Section 01 74 00 - Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: Upon completion, remove surplus materials, rubbish, tools, and equipment.
- .4 Waste Management: Remove waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION