



GOVERNMENT OF BERMUDA
Ministry of Public Works

Department of Works and Engineering

**North shore Water Truckers Outlet
Replacement Water Tank**

Exhibit 'C': Specifications

Section 01000: General Requirements
Section 01100: Summary
Section 01150: Design Parameters
Section 01310: Project Management and Coordination
Section 01330: Submittal Procedures
Section 01770: Closeout Procedures
Section 01781: Project Record Documents



Part 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Comply with the Instructions to Bidders. Conform to the conditions stated in the Contract Agreement, General and Particular Conditions, specifications and drawings, which govern all Work of this contract.
- B. Wherever differences occur in the tender documents, the maximum condition governs and the bid shall be based on the greatest amount.

1.2 DESCRIPTION OF WORK

- A. The Ministry of Public Works (*hereinafter referred to as the "Ministry"*), proposes to have installed a replacement water storage tank at the North Shore Water Truckers Outlet.
- B. The work is to be undertaken in two phases:
 - 1. Firstly design and produce shop drawings to fit on an existing concrete base.
 - 2. The second phase of the contract is to deliver to site and erect and connect and commission the new tank.

1.3 SITE DESCRIPTION

- A. The North Shore Water Truckers Site is a Government owned and operated facility for the purpose of providing water to fill water trucks that supply potable water to the public residences.

1.4 The site has an existing steel tank that will be removed by others to leave an existing concrete base on which to place the new tank.

1.5 Authority Having Jurisdiction

- A. The entire installation shall be reviewed by the Government of Bermuda, Department of Planning Inspectors.

1.6 REVIEW AUTHORITY

- A. The system shall be reviewed by the Ministry's Project Manager (*hereinafter referred to as the "Project Manager"*). Any comments shall be directed to the Project Manager for review and action.

1.7 SCOPE

- A. The work includes the furnishing of all labour, materials, equipment and services necessary for, and reasonably incidental to, the completion of all the Work.
- B. The tank shall be fully tested and left in perfect working order. Any incidental accessories necessary to make the work complete even if not particularly specified shall be furnished.
- C. The specifications are integral with the drawings which accompany them. **Neither is to be used alone.** Any item or subject omitted from one but implied in the other is properly required.



1.8 SERVICE MAINTENANCE AGREEMENT (SEPARATE ADDITIONAL PRICES)

A. Separate Additional Price #1:

1. Comprehensive Service Package including: Service, monitoring, testing, repair labour and materials, inspection and maintenance of Tank for **2 years after substantial completion.**

B. Separate Additional Price #2:

1. A Service Package that provides a six monthly health check visit to the tank. A survey of the tank to be undertaken and a summary report to be produced no less than 7 days after the visit. This service to be provided for **2 years after substantial completion**

1.9 WORK INCLUDED

- A. This work shall include the supply and installation of all the necessary materials and apparatus for the installation of a replacement tank as indicated on the plans or mentioned in this specification, with the exception of materials or apparatus specifically mentioned to be omitted or to be supplied by Ministry.
- B. **Items obviously necessary, or reasonably implied, to complete the work, to be included as if shown on drawings and noted in the specifications.**
- C. All materials, tools, appliances, apparatus, and labour necessary for the execution, erection, and completion of the tank described herein shall be furnished. This includes providing lighting and power for own work.

1.10 CONTRACT DRAWINGS

- A. The drawings of this Package are site drawings and indicate general arrangement of where the tank is to be located and the base on which it is to be placed. They are diagrammatic except where specific details are given.
- B. Based on the information, layout and specifications as shown on the contract documents.

1.11 EXTRA WORK

- A. Any extra work ordered to be done shall be governed by the specification of this contract unless specific instructions or clauses are contained in a Change Variation. In such cases, these instructions or clauses shall supersede those of the specification for that particular application only.

1.12 REGULATIONS

- A. All work associated with this project shall be in accordance with these code specifications and the following standards. Where there is a conflict between standards, the most restrictive will apply.
 1. Bermuda Building Code.
 2. Bermuda Health and Safety Work Act.
 3. International Mechanical Code.



4. International Plumbing Code.

1.13 QUALITY ASSURANCE

- A. The Contractor shall comply with all laws, rules, regulations, codes, orders and requests of all Authorities Having Jurisdiction relating to this work.

1.14 PERMITS, LICENSES, FEES

- A. Contractor will apply and pay for all permits. Pay for any damage or security deposits required by jurisdictional authorities in connection with the completion of this project.
- B. Where permits, licenses and inspection fees are required by Authorities Having Jurisdiction for specific trade functions, they shall be obtained by particular trade responsible for that work.

1.15 STANDARDS OF WORKMANSHIP

- A. The Contractor shall execute all work in a competent manner which will present an acceptable appearance when completed, employing a competent supervisor and all necessary competent tradesmen.
- B. Unless otherwise specified, the Contractor shall handle, install, and commission the new tank, and where necessary shall design and construct, all in accordance with the instructions and recommendations of the tank manufacturer.

1.16 PRODUCT DELIVERY, HANDLING, AND STORAGE

- A. The Contractor shall use all means necessary to protect the tank components during and after installation. Store neatly, out of way, and protect from damage materials and equipment.
- B. Immediately after letting of Contract, review material and equipment requirements. Determine supply and delivery dates of all items. Notify Project Manager of any potential delays in completion of this project, in order that remedial action may be taken.

1.17 JOB CONDITIONS

- A. It is recommended that a representative of the bidder visit the site during Tender period and examine all existing site conditions which may affect work of this Division. Examine all drawings to ensure work may be satisfactorily completed. Notify the Project Manager upon discovery of conditions which adversely affect work. No allowance will be made after letting of Contract for any expenses incurred through failure to do so.
- B. Submission of a Tender confirms that Contract Documents and site conditions are accepted without qualifications unless exceptions are specifically noted in the Tender.

1.18 INTERRUPTIONS

- A. Arrange execution of work to maintain present building operations and to minimize effect of work under this Division on existing operations.
- B. Prior to interrupting any existing service, notify Project Manager in writing at least 48 hours in advance and obtain his written authorization. Do not interrupt any existing service without Project Manager's specific authorization.
- C. Arrange time and duration of interruption through Project Manager. Include in Bid Price,



for all overtime or premium time hours necessary to minimize duration of service interruption.

1.19 GUARANTEE

- A. Submit to Project Manager prior to date of Completion Performance, manufacturers' written warranties covering periods longer than one year or offering greater benefits than required in specifications and in the Ministry's name.
- B. Within a period of 1 year from the date of issue of a Certificate of Substantial Performance of the Work, replace or repair at own expense any defect in workmanship or material.

1.20 SECURITY

- A. Be responsible for security of all areas affected by work of this Contract until taken over by Ministry. Take steps to prevent entry to the work by unauthorized persons and guard against theft, fire and damage by any cause.
- B. Provide suitable surveillance equipment, fencing, and/or employ guard services, as required to adequately protect the work.

1.21 SAFETY AND HEALTH

- A. Legislation
 - 1. Comply with all current Health and Safety Legislation including Bermuda 1982: 26, Occupational Safety and Health Act 1982 and Bermuda Occupational Safety and Health Regulations 2009: BR 65/2009.
- B. Safety and Health Programme
 - 1. Prepare and submit a Safety and Health Programme to the Project Manager at the start of the project.
- C. Notification
 - 1. The Contractor shall, immediately on occurrence of any accident at or about the work area, or in connection with the execution of the Works, report such accident to the Employer. The Contractor shall also report such accident to the appropriate Authority whenever such report is required by Law.
 - 2. The Contractor shall post notices to inform the workers of their conditions of work in conspicuous places at the work places concerned.



Part 2 PRODUCTS

2.1 QUALITY OF PRODUCTS

- A. All products provided shall be UL, ULC, or ETL listed and new, unless otherwise specified.
- B. If products specified are not UL, ULC, ETL, or approved by some other nationally recognized testing or certifying body, the Contractor shall make all modifications and pay expenses required for approval.
- C. Products are generally indicated on the drawings, and shall be of the type, colours, sizes, depths, capacities, ratings and characteristics suitable for each installation. ONLY approved equals will be allowed to be installed. Any equipment found installed that is not approved will be removed and replaced at the Contractor's expense.

2.2 MANUFACTURERS

- A. All manufacturers must have been regularly engaged in the manufacture of the tanks of types and sizes required that have been in satisfactory use in similar service for not less than 5 years.

2.3 UNIFORMITY OF MANUFACTURE

- A. Unless otherwise specifically called for, uniformity of manufacture shall be maintained for similar products throughout the work.

2.4 EQUIVALENTS AND ALTERNATIVES

- A. Unless otherwise noted on the plans or specifications, substitutions may be considered for approval by the Project Manager if requested by the contractor or by equipment suppliers, for items specified by the manufacturer's catalogue number.
- B. Requests for approval of such substitutions shall be submitted at least five (5) working days prior to the tender closing date. Requests received late may not be considered.
- C. Complete description and data sheets of proposed substitution shall accompany the application and supplier must be prepared to submit samples for approval on short notice.
- D. Proposed substitutions must be at least of equal quality to that of the specified item. The manufacturer's specification of the specified item shall apply for comparison if no other clause of this specification applies. The decision of the Project Manager to accept or reject shall be final.
- E. Failure to obtain approval for proposed substitutions or submit a complete list of approved alternates shall mean that only specified products are to be used.



Part 3 EXECUTION

3.1 COORDINATION

- A. The Contractor is responsible for coordinating all Sub-Contractors and suppliers necessary for a complete installation.

3.2 INSTALLATION REQUIREMENTS

- A. Install the tank to the satisfaction of the Project Manager. Unless noted otherwise install all products and services to follow approved plans. Installation shall permit free use of space and maximum headroom.
- B. Install the entire tank in accordance with the manufacturer's requirements and/or recommendations.
- C. Provide all supports, hangers and fasteners. Secure all products and services so as not to impose undue stresses on the structure and systems.

3.3 FINAL INSPECTION

- A. Submit to Project Manager, written request for final inspection of the tank. Include with this submission written certification that:
 - 1. Deficiencies noted during previous inspections have been completed.
 - 2. The Tank has been tested and verified, and are ready for operation.
 - 3. Completed maintenance and operating data have been submitted and approved.
 - 4. Cleaning up is complete.
 - 5. As-built drawings have been completed and approved.
 - 6. Ministry's staff have instructed in operation and maintenance of systems.

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
2. Project information.
 3. Work covered by Contract Documents.
 4. Access to site.
 5. Coordination with Ministry Operations
 6. Work restrictions.
 7. Specification and drawing conventions.

1.2 PROJECT INFORMATION

- A. Project Identification: North Shore Water Truckers Outlet Replacement Water Tank
- B. Project Location: North Shore Road, Devonshire DV 02, Bermuda.
- C. Ministry: Government of Bermuda, Ministry of Public Works (the *Ministry*)
- D. Ministry's Representative/Engineer:
Tarik Christopher, Principal Water and Sewage Engineer,
Department of Works and Engineering,
3rd Floor, 56 Church Street, Hamilton, HM 12, Bermuda.
Phone: 441-278-0571
Mobile: 441-501-3100
Email: tjchristopher@gov.bm
- E. Project Manager: Consultant Project Engineer,
Department of Works and Engineering,
3rd Floor, 56 Church Street, Hamilton, HM 12, Bermuda.
Phone: 441-278-0565
Mobile: 441-704-1965
Email: kclaridge@gov.bm
- F. Construction Project Manager: shall be provided and appointed under the Contract.



1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
1. Manufacture Supply & Installation of glass coated bolted steel Water Storage Tank to be installed on existing concrete base slab.
 2. Design of a protective coating system that shall be constructed of material that will withstand the highly corrosive environment and require minimal maintenance. Any coating system, whether internal or external, shall be durable and allow minimal maintenance. All internal coatings to be compatible for use with the storage of chlorinated potable drinking water with no chemical or material able to be leached from the surface into the stored water.
- B. Type of Contract.
1. Project will be completed under a single contract
 2. The Contract includes the following which may be subcontracted or performed by the Contractor:
 - a. Project Coordination
 - b. Project Management
 - c. Manufacture and supply of components to form a storage tank
 - d. All shipping of components to the job site
 - e. Installation of tank on existing concrete tank and connections to existing pipework
 - f. Final Commissioning & Staff Training

1.4 ACCESS TO SITE

- A. Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Ministry's right to perform work or to retain other contractors on portions of Project.
1. Contractor may utilize designated "lay down area" on site for parking and storage of materials.
 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Ministry, Ministry's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
- B. Accept full responsibility for assigned work areas from the time of Contract award until Substantial Completion of the work.
- C. Where encroachment beyond property limits is necessary make arrangement with respective property owners.
- D. Repair and make good any damage caused at no extra cost to Ministry to the complete satisfaction of the respective property owners and Authorities having jurisdiction. Protect existing building interiors from damage by weather, when executing work which affects integrity of exterior walls and roof.
- E. Use of site: exclusive and complete for executing work. Coordinate all work with the Ministry.



1.5 COORDINATION WITH MINISTRY'S OPERATIONS

- A. Cooperate with Ministry during construction operations to minimize conflicts and facilitate Ministry usage. Perform the Work so as not to interfere with Ministry's day-to-day operations.
- B. The Water Truckers Outlet will be shut down, during which time the contractor shall perform the tank installation and pipe connections.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on parking on public streets and with other requirements of the authorities having jurisdiction.
- B. Existing System Power Interruptions: Do not interrupt power/control systems serving the Truckers Outlet unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Project Manager not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Project Manager's permission before proceeding with utility interruptions.
- C. Nonsmoking Building: Smoking is not permitted within the Depot area.
- D. Controlled Substances: Use of controlled substances on Project site is illegal.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

Part 2 PRODUCTS (Not Used)

Part 3 EXECUTION (Not Used)

END OF SECTION



PART 1 GENERAL

1.1 EMPLOYER'S OBJECTIVES

The objective of the Ministry of Public Works is to replace an existing bolted steel water storage tank for the North Shore Water Truckers Outlet. This work involves design supply and installation of a glass fused steel tank with a nominal capacity of 65,000 US gallons. The tank is to have a maximum height of 15.5 ft with a nominal diameter of 31ft to be founded on an existing concrete foundation.

1.2 DESIGN CONSIDERATIONS

.1 Capacity

The tank shall be a maximum 31ft dia with the invert of the overflow set at a minimum of 12 ft above the base. The tank is to sit on an existing concrete base 32' 4" diameter.

.2 Access to Roof

The access ladder shall be aluminum with lockable barrier at the bottom of the ladder. Aluminum shall be 6061 series alloy or approved equal with 7' handrail sections around hatch

.3 Manway

The manway access shall be a minimum of 24-inch diameter or equivalent and shall be located at the top of the tank. A service access shall be provided in the bottom side of the tank.

.4 Ports

The following ports shall be provided:

- .1 6-inch suction outlet pipe flanged with elbow on the inside
- .2 3-inch flanged delivery port located above the high water level
- .3 6-inch overflow with down spout on outside of tank
- .4 Drain connection - supplier to recommend
- .5 Roofline center vent port - supplier to recommend
- .6 3-inch flanged side wall connections (3 total), one at the top for supply feed and two at the bottom to allow for level transmitters and switches
- .7 3-inch flanged connection on roof for level transmitter.

.5 Level Gauge

A manual water level gauge shall be included and located adjacent or as near as possible to the manway access.

.6 Material and Coatings

The tank shall be constructed of material that will withstand the highly corrosive environment and require minimal maintenance. Any coating system, whether internal or external, shall be durable and allow minimal maintenance.

.7 Tank Base

The tank is to have a full steel floor assembly with ½" impregnated fiber board to be placed between existing concrete base and steel floor.



1.3 DESIGN PARAMETERS

.1 Structural Design

The tank shall be designed to withstand normal operating loads of a water retaining structure.
The tank shall be designed for Seismic Zone 1, Wind loading Exposure C to ASCE 7 (Importance Category 3) for hurricane prone regions or equivalent.

.2 Design Loads

- .1 Design Allowable Tank Code: AWWA D103
- .2 Specific Gravity 1.0 (Min. design shall be 1.0)
- .3 Design Freeboard 12" inches
- .4 Wind Velocity 175 mph
- .5 Roof Live Load 30lbs per Square ft



Part 2 PRODUCTS

1. TANK FABRICATION

1.1 Tank Plates and Sheets:

All steel shall comply with the following and preferably be smelted and produced in the Americas.

- . 1 Plates and sheets used in the construction of the tank shell, tank floor and tank roof, shall comply with the minimum standards of AWWA D103, latest edition.
- . 2 Design requirements for mild strength steel shall be ASTM A1011 Grade 30 with a maximum allowable tensile stress of 14,566 psi.
- . 3 Design requirements for high strength steel shall be ASTM A1011 Grade 50 with a maximum allowable tensile stress of 26,000 psi.
- . 4 The annealing effect created from any glass coated firing process shall be considered in determining ultimate steel strength. In no event shall yield strength greater than 50,000 psi be utilized for calculations detailed in AWWA D103, Sections 3.4 and 3.5.
- . 5 Multiple vertical bolt line sheets and plates of ASTM A607 Grade 50 only shall be manufactured such that holes are staggered in the vertical bolt lines and that no two adjoining holes are in-line horizontally, except at the center of the sheet or plate. When multiple vertical bolt line sheets and plates of ASTM A1011 Grade 50 are used, the effective net section area shall not be taken as greater than 85% of the gross area.

1.2 Rolled Structural Shapes

- . 1 Material shall conform to minimum standards of ASTM A36 or ASTM A992.

1.3 Horizontal Wind Stiffeners

- . 1 Design requirements for intermediate horizontal wind stiffeners shall be of the "web truss" type with an extended tail creating multiple layers of stiffener, permitting wind loads to be distributed around the tank.
- . 2 Web truss stiffeners shall be of steel with hot dipped galvanized coating.
- . 3 Rolled steel angle stiffeners are not permitted for use as intermediate horizontal wind stiffeners.

1.4 Bolt Fasteners

- . 1 Bolts used in tank lap joints shall be ½" - 13 UNC- 2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 2.2.
- . 2 Bolt Material
 - . 1 SAE J429 Grade 2 (1" bolt length)
 - . 1 Tensile Strength - 74,000 psi Min.
 - . 2 Proof Load - 55,000 psi Min.
 - . 3 Allowable shear stress with threads excluded from the shear plane - 18,163 psi Min.



- . 2 SAE J429 Grade 5 (1 1/4" bolt length)
 - . 1 Tensile Strength - 120,000 psi Min.
 - . 2 Proof Load - 85,000 psi Min.
 - . 3 Allowable shear stress with threads excluded from the shear plane – 29,454 psi Min.
- . 3 SAE J429 Grade 8 (>1 1/4" bolt length)
 - . 1 Tensile Strength - 150,000 psi Min.
 - . 2 Proof Load - 120,000 psi Min.
 - . 3 Allowable shear stress with threads excluded from the shear plane – 36,818 psi Min.
- . 3 Bolt Finish - Zinc, mechanically deposited.
 - . 1 2.0 mils (0.002 inches) Min. - under bolt head, on shank and threads.
- . 4 Bolt Head Encapsulation
 - . 1 High impact polypropylene copolymer encapsulation of entire bolt head up to the splines on the shank.
 - . 2 Resin shall be stabilized with an ultraviolet light resistant material such that the color shall appear black.
 - . 3 The bolt head encapsulation shall be certified to meet the ANSI/NSF Standard 61 for indirect additives.
- . 5 All bolts on the vertical tank wall shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
- . 6 All lap joint bolts shall be properly selected such that threaded portions of the bolts will not be exposed to the "shear plane" between tank sheets.
- . 7 Bolt lengths shall be sized to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torquing will not be permitted.
- . 8 All lap joint bolts shall include a minimum of 4 splines on the underside of the bolt head at the shank in order to resist rotation during torquing.

1.5 Sealants

- . 1 The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and shall be certified to meet ANSI/NSF Additives Standard 61 for indirect additives.
- . 2 The sealant shall be used to seal lap joints and bolt connections and edge fillets for sheet notches and starter sheets. The sealant shall cure to a rubber-like consistency, have excellent adhesion to the glass coating, low shrinkage, and be suitable for interior and exterior use.
- . 3 Due to poor compatibility with chlorine, the sealant Sika 1A shall NOT be used on water storage tanks. Sika 1A should only be used in special non-potable water applications.



. 3 Roof

- . 1 Tanks shall include a radially sectioned roof fabricated from glass - coated, bolted steel panels, as produced by the tank manufacturer, and shall be assembled in a similar manner as the sidewall panels utilizing the same sealant and bolting techniques, to assure a weather tight assembly. The roof shall be clear - span and self-supporting. Both live and dead loads shall be carried by the tank walls. The roof shall be of a rolled knuckle design, with no rolled angle connection between sidewall and roof panels. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least 24 inches in one direction and 15 inches in the other direction. The opening shall have a curb at least 4 inches in height, and the cover shall have a downward overlap of at least 2 inches, or a gasketed weather-tight cover in lieu of the 4 inch curb and 2 inch overlap.

1.4 Roof Vent

- . 1 A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum design rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5 inch water column.
- . 2 The overflow pipe shall not be considered to be a tank vent.
- . 3 The vent shall be constructed of aluminum such that the hood can be unbolted and used as a secondary roof access.
- . 4 The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (½ inch) opening. An insect screen of 23 to 25 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

1.5 Appurtenances (per AWWA D103, Section 5)

- . 1 Pipe connections are to pass through tank panels, they shall be field located, saw cut, (acetylene torch cutting or welding is not permitted), and utilize an interior and exterior flange assembly. Tank shell reinforcing shall comply with AWWA D103 latest edition. A single component urethane sealer shall be applied on any cut panel edges or bolt connections.
- . 2 Overflow piping shall be six inches diameter either schedule 80 PVC, seamless aluminum tubing, or FRP.

1.6 Outside Tank Ladder

- . 1 An outside tank ladder shall be furnished and installed as shown on the submittal drawings.
- . 2 Ladders shall be fabricated of aluminum and utilize grooved, skid-resistant rungs.
- . 3 Safety cage and step-off platforms shall be fabricated of galvanized steel. Ladders shall be equipped with a hinged lockable entry device.

1.7 Access Doors

- . 1 One bottom access door shall be provided as shown on the submittal drawings in accordance with AWWA D103.
- . 2 The manhole opening shall be a minimum of 24 inches in diameter. The access door (shell manhole) and the tank shell reinforcing shall comply with AWWA D103 latest edition, Sec. 5.1.



1.8 Identification Plate

- . 1 A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall at a location approximately 5 feet from grade elevation in a position of unobstructed view.

1.9 Cathodic Protection

- . 1 A passive cathodic protection system shall be designed and supplied by the tank manufacturer



2 GLASS COATING SPECIFICATION

2.1 Surface Preparation

- . 1 Following the decoiling and shearing process, sheets shall be steel grit-blasted on both sides to the equivalent of SSPC SP-10 (Near-White Metal Blast Cleaning). Sand blasting and chemical pickling of steel sheets is not acceptable.
- . 2 The surface anchor pattern shall be not less than 1.0 mil (0.001 inches).
- . 3 These sheets shall be evenly oiled on both sides to protect them from corrosion during fabrication.

2.2 Sheet Edges

- . 1 After initial sheet preparation, all full height vertical wall sheets and all rectangular shaped floor sheets shall be mechanically rounded. A metal coating of 316 stainless steel shall then be applied to these edges by an ARC thermal spray of 1.5 to 5 mils (0.0015 to 0.005 inches). The glass coating of the edges shall be similar to the flat panel surfaces. The process shall be applied to all four sheet edges. Overspray of glass side sheets and sealer applied to sheet edge is NOT considered adequate edgecoat protection.

2.3 Cleaning

- . 1 After fabrication and prior to application of the coating system, all sheets shall be thoroughly cleaned by a caustic wash and hot rinse process followed immediately by hot air drying.
- . 2 Inspection of the sheets shall be made for traces of foreign matter, soil particles, grease or rust.

2.4 Factory Coating Technology

- . 1 All side wall sheets shall receive one coat of a catalytic nickel oxide glass pre-coat to both sides and then air dried.
- . 2 Another coat of milled cobalt blue glass shall be applied to both sides of the sheets and then dried.
- . 3 A third coat of milled titanium dioxide white glass shall be applied to all wetted surfaces which must be an 18% to 22% titanium dioxide reinforced mixture. The specified coating shall be Aquastore Vitrium. An acceptable alternate is the TriFusion coating or a three coat, two fire system that must be submitted for approval prior to the bid.
- . 4 The sheets shall then be fired at a minimum temperature of 1500° F in strict accordance with the manufacturer's ISO 9001 quality control procedures, including firing time, furnace humidity, temperature control, etc.
- . 5 The dry film interior coating thickness shall be 10.0 to 18.0 mils (0.010 to 0.018 inches) with an average of 14 mils. The finished **inside color shall be white.**



- . 6 The dry film exterior coating thickness shall be 7.0 to 15.0 mils (0.007 to 0.015 inches). The finished exterior color shall be **Cobalt Blue** (Munsell 7.5PB 2/4).

2.5 Factory Inspection

- . 1 The manufacturer's quality system shall be ISO 9001 certified.
- . 2 Chemical Resistance of Glass Coating - Every batch of component frits shall be individually tested in accordance with PEI Test T-21 (Citric Acid at Room Temperature).
- . 3 Factory Holiday Test - A dry volt test using a minimum of 1100 volts shall be completed. Frequency shall be every sheet. Any sheet registering a discontinuity shall be rejected. All inside sheet surfaces shall be holiday free.
- . 4 Measurement of Glass Thickness - Glass thickness shall be measured using an electronic dry film thickness gage (magnetic induction type) approved by Engineered Storage Products Company. The thickness gage shall have a valid calibration record. All coated sheets shall be inspected for thickness and shall adhere to section 4.4.
- . 5 Measurement of Color - The exterior color of the sheets shall be measured using a colorimeter approved by Engineered Storage Products Company. The colorimeter shall have a valid calibration record. All coated sheets must be checked for color uniformity. The color must fall within the tolerance specified by Engineered Storage Products Company, else the panel shall be rejected.
- . 6 Impact Adherence Test - The adherence of the glass coating to the steel shall be tested in accordance with ASTM B916-01. Any sheet that has poor adherence shall be rejected. Frequency of this test shall be one sheet per gage lot run minimum.
- . 7 Fishscale Test - The glass coating shall be tested for fishscale by placing the full size production sheets in an oven at 400° F for one hour. The sheets will then be examined for signs of fishscale. Any sheet exhibiting fishscale shall be rejected and all sheets from that gage lot will be similarly tested. Frequency of this test shall be one sheet per gage lot run minimum



Part 3 EXECUTION

3.1 Packaging & Shipping

- . 1 All sheets that pass Factory Inspection and Quality Control checks shall be protected from damage prior to packing for shipment.
- . 2 Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet-to-sheet abrasion during shipment.
- . 3 Individual stacks of panels will be wrapped in heavy mil plastic and steel banded to special wood pallets built to maintain the roll-radius of the tank panels and minimize contact or movement of finished panels during shipment.
- . 4 Shipment to include from the factory to the worksite in Bermuda and all necessary precautions are to be made to prevent damage during shipment.

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating installation operations on Project including, but not limited to, the following:
 1. Coordination drawings.
 2. Requests for Information (RFIs).
 3. Project meetings.

1.2 DEFINITIONS

- A. RFI: Request from Contractor seeking information or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate installation operations, included in different Sections that depend on each other for proper fabrication, installation, connection, and operation.
 1. Schedule installation operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other installation activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's installation schedule.
 2. Preparation of the schedule of values.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project closeout activities.
 6. Startup and adjustment of systems.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.



1.6 CONTRACT SCHEDULE

- A. Within fourteen days of contract award, submit in format acceptable to Project Manager, electronic copy of the Contractor's critical path installation schedule.
- B. Use suitable scheduling software (e.g. Microsoft Project) and set up format to permit plotting of actual installation progress against scheduled progress.
- C. Schedule shall show:
 - 1. Commencement and completion dates of contract
 - 2. Commencement and completion dates of fabrication
 - 3. Commencement and completion dates of installation stages/phases.
 - 4. Commencement and completion dates of each trade.
 - 5. Order and delivery dates for major of critical equipment.
 - 6. Critical dates for shop drawing/sample submissions.
 - 7. Any other information relating to orderly progress of contract, considered by contractor or Project Manager to be pertinent
- D. The Project Manager, together with Contractor, shall review installation progress during or immediately following the regular site meeting or more often as directed by the Project Manager.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

1.8 PROJECT MEETINGS & CONFERENCES

- A. General: Schedule and conduct meetings via electronic media
 - 1. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited participants.
 - 2. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, within 3 days of the meeting.
- B. Pre-installation Conference: Project Manager will schedule and conduct a pre-installation conference before starting installation,
- C. Progress Meetings: Construction Manager will conduct progress conferences at regular intervals.
 - 1. Participants: In addition to representatives of the Ministry, Ministry Engineers, Construction Manager, Project Coordinator, and each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants in the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress conference. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Installation Schedule: Review progress since the last conference. Determine whether each activity is on time, ahead of



schedule, or behind schedule, in relation to Contractor's installation schedule. Determine how installation behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
- 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Access.
 - 6) Site utilization.
 - 7) Quality and work standards.
 - 8) Status of correction of deficient items.
 - 9) Field observations.
 - 10) Status of RFIs.
 - 11) Status of proposal requests.
 - 12) Pending changes.
 - 13) Status of Change Orders.
 - 14) Pending claims and disputes.
 - 15) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the conference will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's installation schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

Part 2 PRODUCTS (Not Used)

Part 3 EXECUTION (Not Used)

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, and other submittals.
- B. Related Requirements:
 - 1. Section 01310 "Project Management and Coordination" for submitting RFI's, meeting minutes, and Contractor's construction schedule.
 - 2. Section 01781 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Project Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 7 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Project Manager will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 5 days for review of each resubmittal.
- B. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows: Name file with submittal number or other unique identifier, including revision identifier.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Project Manager's action stamp.
- E. Distribution: Furnish copies of final submittals from manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities.



Part 2 PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:
 - 1. Submit electronic submittals via email as PDF electronic files.
 - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of fabrication or type of product.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. Submit Tank Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Comply with Owner's requirements and office policy.
 - b. Identification of products.
 - c. Schedules.
 - d. Compliance with specified standards.
 - e. Notation of coordination requirements.
 - f. Notation of dimensions established by field measurement.
 - g. Relationship and attachment to adjoining construction clearly indicated.
 - h. Seal and signature of professional engineer if specified.
 - i. Revise "Sheet Size" Subparagraph below to establish a standard sheet size and format.
 - 2. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Coordination Drawings Submittals: Comply with requirements specified in Section 01310 "Project Management and Coordination."
- E. Contractor's Construction Schedule: Comply with requirements specified in Section 01310 "Project Management and Coordination."



- F. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01770 "Closeout Procedures."
- G. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of tank or after tank is installed in its final location, for compliance with requirements in the Contract Documents.

Part 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Shop Drawings and Product Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to the Project Manager.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01770 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- D. Shop Drawings and Product Submittals must be submitted to the Engineer for review prior to ordering and installation of equipment.

3.2 PROJECT MANAGER'S ACTION

- A. General: Project Manager will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Shop Drawings and Product Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Project Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action as follows:

"REVIEWED" or "REVIEWED AS NOTED" - If the Consultant's review of shop drawing is final, the Engineer will stamp the shop drawing "REVIEWED" or "REVIEWED AS NOTED" (appropriately marked).

"RETURNED FOR CORRECTION" - If the Engineer's review of shop drawing is not final, the Engineer will stamp the shop drawing "RETURNED FOR CORRECTION", mark the submission with their comments, and return the submission. Revise the shop drawing in accordance with the Engineer's notations and resubmit.

- C. It is understood that the following is to be read in conjunction with the wording on the Engineer's shop drawing review stamp applied to each and every shop drawing submitted:

"THIS REVIEW BY THE ENGINEER IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THIS REVIEW DOES NOT MEAN THAT THE ENGINEER APPROVES THE DETAIL DESIGN INHERENT IN THE SHOP DRAWINGS, RESPONSIBILITY FOR WHICH REMAINS



WITH THE CONTRACTOR, AND SUCH REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS OR OF HIS RESPONSIBILITY FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. BE RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE, FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCESSES OR TO TECHNIQUES OF CONSTRUCTION AND INSTALLATION, AND FOR COORDINATION OF THE WORK OF ALL SUBTRADES".

- A. When shop drawings are returned and marked "REVIEWED AS NOTED" with revisions marked on the shop drawing copies, such shop drawings are to be revised by the equipment supplier to incorporate the comments marked on the "reviewed" shop drawings and a clean updated copy is to be included in the operating and maintenance manual.
- B. Corrections or comments made on the shop drawings during review do not relieve the Contractor from compliance with the Contract Documents. This check is for the review only and general conformance with the design concept of the project and general compliance.
- C. No drawings shall be used for the purpose of construction which do not have the Engineer's shop drawing review stamp.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01781 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Commissioning and Test Reports.
- C. Request for Substantial Completion.
- D. Warranty Certificates.
- E. Maintenance Contract Documentation.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, and similar final



- record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Project Manager. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Project Manager's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Complete fill up and commissioning of tank.
 2. Instruct Ministry's personnel in operation, adjustment, and maintenance of tank, equipment, and systems.
 3. Participate with Ministry in conducting inspection and walkthrough with local emergency responders.
 4. Terminate and remove temporary facilities from Project site, construction tools, and similar elements.
 5. Complete final cleaning and repair requirements.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Project Manager, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
1. Certified List of Incomplete Items: Submit certified copy of Project Manager's Substantial Completion inspection list of items to be completed or corrected (punch list). Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.



- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Project Manager for the tank where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Ministry's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file.
 - 2. Provide additional copies of each warranty to include in operation and maintenance manuals.

Part 2 PRODUCTS (Not Used)

Part 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances local environmental regulations.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 2. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - 3. Remove labels that are not permanent.
 - 4. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication droppings and other foreign substances.
 - 5. Leave Tank and surrounding area clean and ready for hand over.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

END OF SECTION



Part 1 GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Product Data.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - .1 Submit one paper-copy or PDF electronic files of scanned marked-up record prints.
 - .2 Project Manager will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - .1 Submit one paper-copy or PDF electronic files of scanned approved marked-up record prints.
- B. Record Product Data: Submit in PDF electronic file format of each submittal.

Part 2 PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Shop & Contract Drawings, incorporating revisions as soon as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Project Manager.



2.2 RECORD PRODUCT DATA

- A. This article contains minimum record Product Data submittal requirements adequate for most projects.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
- C. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Examples of miscellaneous record submittals in this article include documentation of tests and inspections and inspections by authorities having jurisdiction.
- B. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- C. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up paper copy of marked-up miscellaneous record submittals.

Part 3 EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the fabrication and installation period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents: Store record documents on site apart from the Contract Documents used for construction. Do not use project record documents for installation purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Project Manager's and Construction Manager's reference during normal working hours.

END OF SECTION