COMMON WORK RESULTS FOR PROCESS INTEGRATION

1. GENERAL

1.1 Submittals

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 In addition to the requirements outlined in Section 01 33 00, Shop Drawings to show:

.1 Mounting arrangements.

.2 Operating and maintenance clearances.

.3 Shop Drawings and product data to be accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.4 Closeout Submittals:

.1 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Operation and maintenance manual approved by, and final copies deposited with, Contract Administrator before final inspection.

.3 Operation data to include:

.1 Control schematics for systems including environmental controls.

.2 Description of systems and their controls.

.3 Description of operation of systems at various loads together with reset schedules and seasonal variances.

.4 Operation instruction for systems and components.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.7 Colour coding chart.

.4 Maintenance data to include:

.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

.2 Data to include schedules of tasks, frequency, tools required and task time.

.5 Performance data to include:

.1 Equipment Manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.6 Approvals:

.1 Submit two (2) copies of draft Operation and Maintenance Manual to the Contract Administrator for approval. Submission of individual data will not be accepted unless directed by the Contract Administrator.

.2 Make changes as required and re-submit as directed by Contract Administrator.

.7 Additional data:

.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.8 As-built Drawings:

.1 Prior to start of Testing, finalize production of As-built Drawings.

.2 Identify each Drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW PROCESS SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Contract Administrator for approval and make corrections as directed.

.4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

1.2 Maintenance

.1 Provide one (1) set of special tools required to service equipment as recommended by Manufacturers and in accordance with Section 01 78 00 - Closeout Submittals.

2. PRODUCTS (NOT USED)

3. EXECUTION (NOT USED)

END OF SECTION

1. GENERAL

1.1 Design Standard

.1 American Petroleum Institute (API):

.1 STD 600, Steel Gate Valves-Flanged and Butt-welding Ends, Bolted Bonnets

.2 STD 602, Steel Gate, Globe, and Check Valves for Sizes NPS 4 (DN 100) and Smaller for the Petroleum and Natural Gas Industries

.3 STD 608, Metal Ball Valves – Flanged, Threaded, and Welding Ends

.2 American Society of Mechanical Engineers (ASME):

.1 B16.1, Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.

.3 American Society of Sanitary Engineering (ASSE):

.1 1011, Performance Requirements for Hose Connection Vacuum Breakers.

.4 ASTM International (ASTM):

.1 A276, Standard Specification for Stainless Steel Bars and Shapes.

.2 A351/A351M, Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.

.3 A564/A564M, Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.

.4 B61, Standard Specification for Steam or Valve Bronze Castings.

.5 B62, Standard Specification for Composition Bronze or Ounce Metal Castings.

.6 B98, Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.

.7 B127, Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.

.8 B139/B139M, Standard Specification for Phosphor Bronze Rod, Bar, and Shapes.

.9 B164, Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.

.10 B194, Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.

.11 B584, Standard Specification for Copper Alloy Sand Castings for General Applications.

.12 D429, Standard Test Methods for Rubber Property - Adhesion to Rigid Substrates.

.13 D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

.5 American Water Works Association (AWWA):

.1 C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.2 C500, Metal-Seated Gate Valves for Water Supply Service.

.3 C504, Rubber-Seated Butterfly Valves, 3 In. (75 mm) Through 72 In. (1,800 mm).

.4 C508, Swing-Check Valves for Waterworks Service, 2 In. Through 24 In. (50 mm Through 600 mm) NPS.

.5 C509, Resilient-Seated Gate Valves for Water Supply Service.

.6 C510, Double Check Valve, Backflow Prevention Assembly.

.7 C511, Reduced-Pressure Principle Backflow Prevention Assembly.

.8 C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates

.9 C542, Electric Motor Actuators for Valves and Slide Gates

.10 C550, Protective Interior Coatings for Valves and Hydrants.

.6 International Society of Automation (ISA):

.1 S20, Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves

.7 Manufacturers Standardization Society (MSS):

.1 SP-81, Stainless–Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.

.2 SP-88, Diaphragm Valves.

.8 NSF International (NSF)

.1 61, Drinking Water System Components - Health Effects

1.2 Submittals

.1 Submit Shop Drawings and product data including:

.1 Product data sheets for each make and model, including complete catalogue information, descriptive literature, specifications, and identification of materials of construction.

.2 Shop Drawings for complete actuator assemblies and accessories prior to delivery.

.3 Calculations for sizing, noise, cavitation and actuator torque for open-close/throttle and modulating valves. Provide valve coefficient (Cv) versus percent open curves for each size of valve in each process area.

.4 Power and control wiring diagrams, including terminals and numbers.

.5 Complete motor nameplate data.

.6 Completed ISA S20 form for each device.

.7 Certificate of compliance for:

.1 Electric operators; full compliance with AWWA C542.

.2 Butterfly valves; full compliance with AWWA C504.

.3 API classes 300 and 600 valves; full compliance with API standards.

.4 API classes 300 and 600 valves; full compliance with API standards.

.8 Operation and Maintenance Manual.

2. PRODUCTS

2.1 General

.1 All process valves shall conform to appropriate AWWA Standards.

.2 Provide new material only.

.3 All valves to include operator, actuator, handwheel, chain wheel, extension stem, worm and gear operator, operating nut, chain, wrench, and accessories for a complete operation.

.4 The system shall be designed to provide actuated operators to facilitate ease of operation. All valves shall have an actuator/operator appropriate to their function. All actuators to be electric. Pneumatic actuators not acceptable.

.5 Valve to be suitable for intended service. Renewable parts not to be of a lower quality than specified.

.6 Valve ends to suit adjacent piping.

.7 Size operator to operate valve for the full range of pressures and velocities.

.8 Valve to open by turning counterclockwise.

.9 Factory mount operator, actuator, and accessories.

.10 Provide lubricants of the type recommended by the equipment Manufacturer in sufficient quantity to fill all lubricant reservoirs and to replace all consumption during testing, start-up and operation prior to Substantial Performance.

2.2 Materials

.1 All wetted valve parts in contact with chemicals shall be chemically resistant to the chemical application.

2.3 Factory Finishing

.1 Epoxy Lining and Coating:

.1 In accordance with AWWA C550 unless otherwise specified.

.2 Either two-part liquid material or heat-activated (fusion) material

.3 Minimum 0.18 mm dry film thickness except where limited by valve operating tolerances.

.2 Exposed Valves:

.1 In accordance with Division 43 for factory applied protective coatings.

.2 Safety isolation valves and lockout valves with handles, or handwheels “safety yellow.”

2.4 Accessories

.1 Tagging: 38 mm diameter heavy brass or stainless steel tag attached with No. 16 solid brass or stainless steel jack chain for each valve.

.2 T-Handled Operating Wrench:

.1 One each galvanized operating wrench, 1.22 m long.

.2 One each galvanized operating key for cross handled valves.

.3 Extension Bonnet for Valve Operator: Complete with enclosed stem, extension, support brackets, and accessories for valve and operator.

.4 Floor Box and Extension Stem:

.1 Watertight floor box for support of nonrising type stem.

.2 Complete with solid extension stem, operating nut, and stem guide brackets.

.3 Stem Guide: Space such that stem L/R ratio does not exceed 200.

.4 Anchor Bolts: Type 304 SS.

.5 Chain Wheel and Guide:

.1 Handwheel direct-mount type.

.2 Complete with chain.

.3 Galvanized or cadmium-plated.

3. EXECUTION (NOT USED)

END OF SECTION