BIDDING AND CONTRACT DOCUMENTS
FOR THE
BRUNSWICK COUNTY PUBLIC UTILITIES
NORTHWEST WATER TREATMENT PLANT – EXPANSION AND UPGRADES

DOCUMENT 009106

ADDENDA

ADDENDUM NUMBER 6

DATE: **February 24, 2020**

PROJECT: **NORTHWEST WATER TREATMENT PLANT – EXPANSION AND UPGRADES**

OWNER: BRUNSWICK COUNTY PUBLIC UTILTIES

ENGINEER: CDM SMITH

TO: Project Planholders

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated October 2019, with amendments and additions noted herein below.

Acknowledge receipt of this Addendum in the space provided in the Bid form. Failure to do so may disqualify the Bidder.

This Addendum consists of 4 pages.

IN THE SPECIFICATIONS

SECTION 123553.13

1. DELETE Specification Section 123553.13 “Metal Laboratory Casework” in its entirety.

SECTION 123553.13

1. ADD attached Specification Section 123553.19 “Wood Laboratory Casework”.

SECTION 331300.01

1. Replace Section 331300.01 with the attached.

SECTION 400523

1. ADD the following to subparagraph 2.4.A.2:
   “e) Aerex Industries, Fort Pierce, Florida.”
2. ADD the following to subparagraph 2.4.B.1(b):
   “e) Aerex Industries, Fort Pierce, Florida.”
3. ADD the following to subparagraph 2.4.B.2(b):
   “e) Aerex Industries, Fort Pierce, Florida.”

SECTION 400562

1. Remove valve PV-7214 from the Plug Valve Schedule.
2. In the Plug Valve Schedule, add the following row:

Valve Designation	Size (inches)	Operator Type	Actuator Type	Service
PV-3124	1	open/close	manual	Filter-To-Waste

SECTION 400565.35

1. In the Globe Body Silent Check Valves Schedule, add the following rows:

Valve Designation	Size (inches)	Operator Type	Actuator Type	Service
CV-3510	20	open/ close	Automatic	Filter Backwash Supply
CV-3520	20	open/ close	Automatic	Filter Backwash Supply

SECTION 400578.10

1. In the Air Release Valve Schedule, Row 3 (AVRV for Filter Backwash), under column “Function”, replace “Large Air Release” with “Pump Column Drain/Fill”. Under column “Accessories”, add “Hood”.

SECTION 400563.00

1. Replace Section 400563.00 with the attached.

SECTION 406100

1. Replace the table in 406100.1.2.B.3 in its entirety with the following:

	Hardware (instruments, control panels, PLCs, network switches) and Networking Configuration, except as noted on individual sheets	PLC Programming	HMI Development
Generator and Electrical Equipment (I-YP-3)	Contractor	PCSS	PCSS
Raw Water and Rapid Mix (I-RM)	PCSS	PCSS	Owner
Clarifiers (I-CL)	PCSS	PCSS	Owner
Filters (I-FL)	PCSS	PCSS	Owner
Membrane Treatment systems except Membrane Skids and Carbon Dioxide (I-RO-1 thru 3, 5 thru 9)	PCSS	PCSS	PCSS
Membrane Skids (I-RO-4)	MSS (Section 466323)	MSS	PCSS
Carbon Dioxide (I-RO-10)	Vendor	Vendor	PCSS
Chlorine (I-CB-1 and 2)	PCSS	PCSS	Owner
Chlorine Scrubber (I-CB-3)	Vendor	Vendor	Owner
Chlorine Dioxide Generators (I-CB-4)	Vendor	Vendor	Owner
Chlorine Dioxide Feed Pumps (I-CB-4)	PCSS	PCSS	Owner
Finished Water (I-PS-1)	PCSS	PCSS	Owner
Thickeners (I-GT)	PCSS	PCSS	Owner
Sludge Basin (I-SB)	PCSS	PCSS	Owner
Chemicals (I-AB)	PCSS	PCSS	Owner

SECTION 464361

1. In Paragraph 1.8D, revise Table 1.d per below:

d.	Flocculator/ Clarifiers (Clarifier Basin[1])	
i.	Number of Basins/ Train	2
ii.	Effective Settling Area, each Basin (L X W, feet^2)	3,149
iii.	Water Depth, feet	16.04

2. Append the following to Paragraph 1.8H.1:
   "System Supplier to provide guidance in the O&M manuals on:
   a. Steps for taking any basin offline.
   b. Duration for which any basin can be taken offline without draining.
   c. After the basin has been offline, what is the maximum duration after which the basin needs drained."
3. Revise Paragraph 1.10G to read "The clarified water shall be collected in collection launders and channels in each clarifier where it is discharged to a conduit leading to downstream treatment units of the plant."
4. Delete the following from Paragraph 1.10H: "The performance requirements shall overlap with equipment warranty."
5. In subparagraph 1.11A.1, replace the sentence beginning "Mark or tag separate parts and assemblies…" with the following:
   "Mark or tag separate parts and assemblies including stainless steel support brackets/ hangers for collection/distribution laterals and sludge draw-off pipes in separate boxes to facilitate field assembly if products are to be shipped disassembled."
6. Delete the following from subparagraph 1.12E.5: "If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the Owner."

7. Paragraph 2.3B.1, replace “The pipes shall be supported as shown on the Drawings” with “The pipes shall be supported using concrete blocks or Type 304 stainless steel supports at spacings and locations recommended by the System Supplier”.
8. Paragraph 2.3E.2, append to the first sentence “at spacings and locations recommended by the System Supplier”.
9. Revise Paragraph 2.3E.1 to read “The sludge extraction system shall consist of 4-inch diameter header and 6-inch diameter lateral draw-off pipes of Schedule 80 PVC with appropriate joints and fittings and manual and automatic valves as shown on the Drawings.”
10. In Paragraph 2.3E.2, replace “Type 304” with “Type 316”.

SECTION 466123.11

1. Paragraph 2.4L.1, replace “An automatically operated 24-inch wafer type butterfly valve…..” with “An automatically operated 24-inch butterfly valve……”
2. Paragraph 2.4L.2, revise second sentence “The valve is to be wafer type, rubber seated butterfly valve” to “The valve is to be rubber seated butterfly valve.”
3. Paragraph 2.4L.3, revise second sentence “The valve is to be wafer type, rubber seated butterfly valve” to “The valve is to be rubber seated butterfly valve.”

IN THE DRAWINGS

C-YP-5

1. On the north wall of West Clarifier Basin 2, at location of callout “10” AS-SS304”, add callout “REPLACE 10” SS ELBOW WITH TEE (C.L. EL. 74.0).”
2. On south wall of West Clarifier Basin 2, add callout “10” AS SS304 PIPE ROUTED ALONG EXISTING CLARIFIERS (C.L. EL. 67.0 OR ABOVE). AVOID CONFLICT WITH SLUDGE BLOWDOWN PIPING.”
3. On the elevated walkway south of West Clarifier Basin 1, add callout “10” AS SS304 PIPE ROUTED ALONG ELEVATED WALKWAY”.
4. Where 10” AS-SS304 terminates near West Filters 5-8, add callout “ELBOW INTO FILTER BUILDING (C.L. EL. 65.0)”.

M-CL-13

1. For Section 3, revise callout “6” PV-PVC (TYP 11) PV-2012 TO PV-2022 CL EL. 61.21” to read “6” PV-CAST IRON (TYP 11) PV-2012 TO PV-2022 CL EL. 61.21”.
2. REPLACE “1/2” CA-CU (TYP 22) FROM SOLENOID VALVE CONTROL PANEL 1 SEE NOTE 5” with “1/2” CA-HDPE (TYP 22) FROM SOLENOID VALVE CONTROL PANEL 1 SEE NOTE 5”

M-CL-13

1. Add the following note to Detail B:
   “6. Ball check valve shall have 150 psi minimum non-shock cold water pressure rating and integral union with socket or flanged ends. Valves shall be as manufactured by ASAHI/America, Chemtrol Products, Hayward or equal.”

M-D-5

1. On Detail H, add the following to the callout “Custom Fabricated Splash Guard”: “Splash guard shall consist of 1/4” thick 304 SS plate welded to the face of a 16” nominal 304 SS, 150# plate flange. Plate shall measure 16” in the vertical direction and shall be curved to match ½ the circumference of the SS flange’s inside diameter. Flange bolt hole drilling pattern shall match that of the 16” DI elbow with screened opening.”

ATTACHMENTS

1. Section 123553.19 “Wood Laboratory Casework”
2. Section 331300.01 “Disinfecting of Water Process Basins”
3. Section 400563.00 “Ball Valves”
4. Additional Contractor Questions and Responses

END OF ADDENDUM 6

Section 123553.19 – Wood Laboratory Casework

SECTION 123553.19 - WOOD LABORATORY CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wood laboratory casework.
2. Filler and closure panels.
3. Laboratory casework system that includes support and utility-space framing, filler and closure panels, and modular countertops.
4. Laboratory countertops.
5. Shelves.
6. Laboratory sinks.
7. Laboratory accessories.
8. Water fittings.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking for anchoring laboratory casework.
2. Section 096513 "Resilient Base and Accessories" for resilient base applied to wood laboratory casework.

1.3 DEFINITIONS

A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.

1. Ends of cabinets, including those installed directly against walls or other cabinets, are defined as "exposed."
2. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets are defined as "concealed."

B. Semi-Exposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches or more above floor and bottoms of cabinets more than 24 inches but less than 48 inches above floor are defined as semi-exposed.

C. Concealed Surfaces of Casework Include: sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

D. MDF: Medium-density fiberboard.

E. Hardwood Plywood: A panel product composed of layers, or plies, of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive and faced both front and back with hardwood veneers.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

B. Keying Conference: Conduct conference at Project site. Incorporate keying conference decisions into final keying requirements.

1.5 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.

B. Coordinate installation of laboratory casework with installation of fume hoods and other laboratory equipment.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For laboratory casework. Include plans, elevations, sections, and attachment details.

1. Indicate types and sizes of cabinets.
2. Indicate locations of hardware.
3. Indicate locations and types of service fittings.
4. Indicate locations of blocking and reinforcements required for installing laboratory casework.
5. Include details of support framing system.
6. Include details of exposed conduits, if required, for service fittings.
7. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
8. Include coordinated dimensions for laboratory equipment specified in other Sections.

C. Samples for Initial Selection: For cabinet finishes and other materials requiring color selection.

D. Samples for Verification: For each type of cabinet finish and each type of countertop material, in manufacturer's standard sizes.

E. Samples for Verification: Unless otherwise directed, approved full-size Samples may become part of the completed Work, if in an undisturbed condition at time of Substantial Completion.

Notify Engineer of their exact locations. If acceptable full-size Samples at Project site are not incorporated into the Work, retain and remove them when directed by Engineer.

1. One full-size, finished base cabinet complete with hardware, doors, and drawers.
2. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
3. One Sample each of hinged and sliding doors.
4. 6-inch- square Samples for each type of countertop material.
5. One of each service fitting specified, complete with accessories and specified finish.
6. One of each type of sink and accessory item specified.
7. One of each type of hardware item specified.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Test Reports:

1. Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
2. Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface materials with requirements specified for chemical and physical resistance.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Cabinet Mounting Clips and Related Hardware: Quantity equal to 5 percent of amount installed, but no fewer than 20 of each type.
2. Modular Countertop Units: Two extra units of each length and material installed.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 W.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.11 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet work are complete and dry, and temporary HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 CASEWORK MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Kewaunee Scientific Corporation.
2. Or approved equal.

B. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.

C. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes and similar door and drawer configurations and complying with Specifications may be considered. See Section 016000 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

A. System Structural Performance: Laboratory casework and support framing system shall withstand the effects of the following gravity loads and stresses without permanent deformation, excessive deflection, or binding of drawers and doors:

1. Support Framing System: 600 lb/ft..
2. Suspended Base Cabinets (Internal Load): 160 lb/ft..
3. Work Surfaces (Including Tops of Suspended Base Cabinets): 160 lb/ft..
4. Wall Cabinets (Upper Cabinets): 160 lb/ft..
5. Shelves: 40 lb/sq. ft..

2.3 CASEWORK, GENERAL

A. Casework Product Standard: Comply with SEFA 8 W, "Laboratory Grade Wood Casework."

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 WOOD CASEWORK

A. Design: Lipped overlay with radiused edges.

1. Provide 1/8-inch reveals between doors and drawers that are adjacent.

B. Wood Species: Red oak.

C. Matching:

1. None required; select and arrange components for compatible grain and color.

D. Grain Direction:

1. Vertical on both doors and drawer fronts, with continuous vertical matching.
2. Vertical on doors, horizontal on drawer fronts.
3. Lengthwise on face frame members.
4. Vertical on end panels.
5. Side to side on bottoms and tops of units.
6. Vertical on knee-space panels.
7. Horizontal on aprons and table frames.

E. Exposed Materials:

1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
2. Plywood: Hardwood plywood, either veneer core or particleboard core, made without urea formaldehyde with face veneer of species indicated. Grade A exposed faces, at least 1/50 inch thick, and Grade J crossbands. Provide backs of same species as faces.
3. Solid Wood: Clear hardwood lumber of species indicated.

F. Semi-Exposed Materials:

1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.
2. Plywood: Hardwood plywood of any species similar in color and grain to exposed plywood. Grade B faces and Grade J crossbands. Provide backs of same species as faces.
3. Provide solid wood or hardwood plywood for semi-exposed surfaces unless otherwise indicated.
4. Metal for Steel Drawer Pans: Cold-rolled, carbon-steel sheet complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.

G. Concealed Materials:

1. Solid Wood: Any species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Provide backs of same species as faces.
3. Particleboard.
4. MDF.
5. Hardboard.

2.5 WOOD CABINET MATERIALS

A. General:

1. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.

B. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.

C. MDF: ANSI A208.2, Grade 130.

D. Particleboard: ANSI A208.1, Grade M-2.

E. Hardboard: ANSI A135.4, Class 1 Tempered.

F. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch- thick, solid wood of same species as face veneer.

1. Select wood edgebanding for grain and color compatible with face veneers.
2. Colors: As selected by Engineer from manufacturer's full range.

2.6 AUXILIARY CABINET MATERIALS

A. Acid Storage-Cabinet Lining: 1/4-inch- thick, polyethylene, polypropylene, epoxy, or phenolic-composite lining material.

2.7 COUNTERTOP SHELF AND SINK MATERIALS

A. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Durcon; a Wilsonart Company.
b. Kewaunee Scientific
c. Prime Industries, Inc.
d. Or approved equal.

2. Physical Properties:

a. Flexural Strength: Not less than 10,000 psi.
b. Modulus of Elasticity: Not less than 2,000,000 psi.
c. Hardness (Rockwell M): Not less than 100.
d. Water Absorption (24 Hours): Not more than 0.02 percent.
e. Heat Distortion Point: Not less than 260 deg F.

3. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:

a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).

4. Color: As selected by Engineer from epoxy manufacturer's full range.

2.8 FABRICATION

A. Construction: Provide wood-faced laboratory casework complying with SEFA 8 W and of the following minimum construction:

1. Bottoms of Base Cabinets and Tall Cabinets: 3/4-inch thick, hardwood plywood.
2. Tops and Bottoms of Wall Cabinets and Tops of Tall Cabinets: 1-inch thick, veneer-core hardwood plywood.
3. Ends of Cabinets: 3/4-inch thick, hardwood plywood.
4. Shelves: 1-inch thick, veneer-core hardwood plywood.
5. Base Cabinet Top Frames: 3/4 x 2 inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.
6. Base Cabinet Stretchers: 3/4 x 4-1/2 inch panel product strips or solid-wood boards at front and back of cabinet, glued and pinned or screwed.
7. Base Cabinet Subtops: 3/4-inch thick, panel product glued and pinned or screwed.
8. Exposed Backs of Cabinets: 3/4-inch thick, hardwood plywood.
9. Unexposed Backs of Cabinets: 1/4-inch thick, hardwood plywood dadoed into sides, bottoms, and tops, unless otherwise indicated.
10. Drawer Fronts: 3/4-inch thick, hardwood plywood or solid hardwood.
11. Drawer Sides and Backs: 1/2-inch thick, solid hardwood or hardwood plywood, with glued dovetail or multiple-dowel joints.
12. Drawer Bottoms: 1/4-inch thick, veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers.
13. Drawer Bodies: Steel drawer pans formed from 0.036-inch thick metal, metallic phosphate treated, and finished with manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil for topcoat and 2 mils for system.
14. Doors: 3/4-inch thick, with particleboard or MDF cores, solid-hardwood stiles and rails, and hardwood face veneers and crossbands.

Tables: Solid-hardwood legs, not less than 2 inches square with solid-hardwood stretchers as needed to comply with product standard. Bolt stretchers to legs and cross-stretchers, and bolt legs to table aprons.

1. Leg Shoes: Black vinyl or rubber, open-bottom, slip-on type.

C. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.

1. Provide knee-space panels (modesty panels) at spaces between base cabinets, where.

2. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.
3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.

2.9 LABORATORY CASEWORK SYSTEM

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Kewaunee Scientific Corporation.
2. Or approved equal.

B. Provide casework manufacturer's standard integrated system that includes support framing, suspended modular wood cabinets, filler and closure panels, countertops, and fittings needed to assemble system. System includes hardware and fasteners for securing support framing to permanent construction.

1. Cabinets can be removed and reinstalled without use of special tools for relocation within system.
2. Base cabinets can be removed without providing temporary support for, or removing, countertops.
3. Sinks are supported independent of base cabinets.
4. Support framing has provision for fastening pipe supports at utility space in not more than 1-inch increments.
5. System includes filler and closure panels to close spaces between support framing, cabinets, shelves, countertops, floors, and walls unless otherwise indicated. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.

C. Support Framing: Casework manufacturer's standard system consisting of vertical supports and connecting braces and rails as follows:

1. Cabinets, shelves, and countertops are supported from vertical supports except where floor-supported base cabinets are indicated. Vertical positioning of supported cabinets, shelves, and countertops can be varied in 1-inch increments through full height of supports.
2. Vertical supports rest on adjustable leveling bases and are secured to floor with metal clips fastened to floor.
3. Vertical supports are installed with braces and rails, connecting them to each other and to permanent building walls to create a stable, rigid structure with framed utility spaces where indicated.
4. Vertical supports are braced at floor with cantilevered horizontal leg members where indicated.

D. Countertops: Provide in modular lengths indicated, without seams.

2.10 WOOD FINISH

A. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.

B. Staining: Remove fibers and dust and apply stain to exposed and semi-exposed surfaces as necessary to match approved Samples. Apply stain in a manner that produces a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.

1. Stain Color: As selected by Engineer from manufacturer's full range.

C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.

1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 W. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2.11 HARDWARE

A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

B. Butt Hinges: Stainless-steel, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two for doors 48 inches high or less and three for doors more than 48 inches high.

C. Hinged Door and Drawer Pulls: Solid-aluminum, stainless-steel, or chrome-plated-brass back-mounted pulls. Provide two pulls for drawers more than 24 inches wide.

1. Design: As selected from manufacturer's full range.
2. Overall Size: As selected from manufacturer's full range.

D. Sliding Door Pulls: Stainless-steel or chrome-plated recessed flush pulls.

1. Design and Size: As selected from manufacturer's full range.

E. Pulls: Recessed aluminum pulls. Provide two pulls for drawers more than 24 inches wide.

F. Door Catches: Nylon-roller spring catches. Provide two catches on doors more than 48 inches high.

G. Drawer Slides: Side mounted, epoxy-coated steel, self-closing; designed to prevent rebound when drawers are closed; complying with BHMA A156.9, Type B05091.

1. Provide Grade 1; for drawers not more than 6 inches high and 24 inches wide.
2. Provide Grade 1HD-100; for drawers more than 6 inches high or 24 inches wide.
3. Standard Duty (Grade 1): Full-extension type, with polymer rollers.

4. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Full-overtravel-extension, ball-bearing type.

H. Label Holders: Stainless steel, aluminum, or chrome plated; sized to receive standard label cards approximately 1 by 2 inches, attached with screws or rivets. Provide on all drawers.

I. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.

J. Adjustable Shelf Supports: Powder-coated steel shelf rests complying with BHMA A156.9, Type B04013.

K. Adjustable Shelf Supports: Mortise-type, powder-coated steel standards and shelf rests complying with BHMA A156.9, Type B04071 and Type B04091.

L. Adjustable Wall Shelf Supports: Surface-type steel standards and steel shelf brackets, with epoxy powder-coated finish, complying with BHMA A156.9, Type B04102 and Type B04112.

2.12 COUNTERTOPS, SHELVES AND SINKS

A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch, with continuous drip groove on underside 1/2 inch from edge.

B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Engineer.

1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2, unless otherwise indicated.
2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches less than sink depth. Provide in same material as strainer.

C. Epoxy Countertops and Sinks:

1. Countertop Fabrication: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.

    a. Countertop Configuration: Flat, 1 inch thick, with rounded edge and corners, and with drip groove and integral coved backsplash.
    b. Countertop Construction: Uniform throughout full thickness.
    c. Product Option: Phenolic-composite countertops may be substituted for epoxy countertops at Contractor's option.

2. Sink Fabrication: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.

    a. Provide with polypropylene strainers and tailpieces.
    b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.

c. Provide manufacturer's recommended adjustable support system for table- and cabinet-type installations.

D. Stainless-Steel Shelves: Made from stainless-steel sheet, not less than 0.050-inch nominal thickness, with No. 4 satin finish. Weld shop-made joints. Fold down front edge 3/4 inch; fold up back edge 3 inches. Provide integral stiffening brackets, formed by folding up ends 3/4 inch and welding to upturned back edge. After fabricating, grind welds smooth, and polish as needed to produce uniform, directionally textured finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

2.13 LABORATORY ACCESSORIES

A. Pegboards: Polypropylene, epoxy, or phenolic-composite pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.

2.14 WATER AND LABORATORY GAS SERVICE FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Broen A/S.
2. Chicago Faucets; Geberit Company.
3. WaterSaver Faucet Co.
4. Or approved equal.

B. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures - Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.

1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.

C. Materials: Fabricated from cast or forged red brass unless otherwise indicated.

1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.

D. Finish: Acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes.

1. Provide chemical-resistant powder coating in laboratory casework manufacturer's standard metallic brown, aluminum, white, or other color as approved by Engineer.

E. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.

1. Water fittings with serrated outlets.
2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
3. Self-Closing Valves: Provide self-closing valves where indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

A. Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:

1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.

C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.

1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than two fasteners per side.

D. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches o.c.

E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

F. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

A. Comply with installation requirements in SEFA 2.3. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where indicated on Shop Drawings.

B. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.

C. Fastening:

1. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
2. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.

D. Provide required holes and cutouts for service fittings.

E. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

F. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

A. Comply with installation requirements in SEFA 2.3.

B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF LABORATORY ACCESSORIES

A. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.

B. Securely fasten adjustable shelving supports, stainless-steel shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.

C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

D. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.

3.6 INSTALLATION OF SERVICE FITTINGS

A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.

B. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

3.7 CLEANING AND PROTECTING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Engineer.

B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches o.c.

3.8 SERVICE-FITTING SCHEDULE

A. Water Service Fitting:

1. Fitting Type: Rigid, gooseneck mixing faucet.
2. Outlet: removable serrated outlet.
3. Mounting: Deck mounted.

END OF SECTION 123553.19

Section 331300.01 – Disinfecting of Water Process Basins

SECTION 331300.01 - DISINFECTING OF WATER PROCESS BASINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Disinfection of potable water process piping and valve systems.
2. Disinfection of backwash equalization tank
3. Disinfection of RO piping and equipment
4. Testing and reporting of results.

B. Related Requirements:

1. Section 400511 “Common Requirements for Process Valves”: Lists the common requirements for process valves.
2. Section 40519 “Ductile Iron Process Pipe”.
3. Section 400523 “Stainless Steel Process Pipe and Tubing”.
4. Section 400524 “Steel Process Pipe”.
5. Section 400531 “Thermoplastic Process Pipe”.

1.3 ACTION SUBMITTALS

A. See Section 013300 “Submittal Procedures” for detailed submittal.

B. Product Data: Procedures, proposed chemicals, and treatment levels.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer's Certificate: Provide copies of SDS and product information for proposed disinfectant. To be submitted by Contractor for review and acceptance by Owner and Engineer.

B. Certify water conforms or fails to conform to bacterial standards of the North Carolina Department of Environmental Quality.

C. Test and Evaluation Reports: Testing results comparative to specified requirements.

D. Field Quality-Control Submittals: Results of Contractor-furnished tests and inspections.

E. Disinfection and Chlorination Water Disposal Plan: To be submitted by Contractor for review and acceptance by Owner and Engineer.

1.5 CLOSEOUT SUBMITTALS

A. See Section 017700 “Closeout Procedures” for submittal requirements.

B. Disinfection Report:

1. AWWA Method of Disinfection used.
2. Type and form of disinfectant used.
3. Date and time of disinfectant injection start and time of completion.
4. Test locations.
5. Special disinfecting procedures used for connections to existing pipes.
6. Name of person collecting samples.
7. Initial and 24-hour disinfectant residuals in treated water in ppm for each outlet tested.
8. Date and time of flushing start and completion.
9. Disinfectant residual after flushing in ppm for each outlet tested.

C. Bacteriological Report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Submit bacteriologist's signature and authority associated with testing.
8. Owner reserves to either self-perform or hire an outside firm to complete the bacteriological testing.

1.6 QUALITY ASSURANCE

A. Perform Work according to AWWA C653-13 “Disinfection of Water Treatment Plants, AWWA C652-11 for disinfection of tanks, and the North Carolina Department of Environmental Quality.

1.7 QUALIFICATIONS

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum five years' documented experience.

B. Testing Firm: Company specializing in testing potable water systems, approved by State of North Carolina.

PART 2 - PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: Hypochlorite: Comply with AWWA B300.

PART 3 - EXECUTION

3.1 EXAMINATION

A. See Section 017300 “Execution” for installation examination requirements.

B. Verify that piping system has been cleaned, inspected, and pressure tested.

C. Perform scheduling and disinfecting activity with startup, water pressure testing, adjusting and balancing, and demonstration procedures, including coordination with related systems.

3.2 INSTALLATION

A. Provide and attach required equipment to perform Work of this Section. Closely coordinate efforts with Owner for maintenance of site operations and for testing services.

B. Introduce treatment into process piping or tank system such that the residual chlorine level is at or above 50 ppm. At no point should the residual chlorine level exceed 200 ppm.

C. Maintain disinfectant in system for 24 hours. Engineer to witness Contractor confirming residual chlorine levels of at least 50 ppm at the end of the 24-hour test. Acceptable methods for disinfection within AWWA C652 Contractor shall submit disinfection plan prior to implementation.

D. Flush, circulate, and clean until required cleanliness is achieved using potable water.

E. Replace permanent system devices that were removed for disinfection.

F. Methods described in AWWA C652-11 can be utilized with the approval of Engineer and Owner.

G. All disinfection plans shall be submitted to Engineer and Owner prior to utilization.

3.3 FIELD QUALITY CONTROL

A. See Section 017300 “Execution” for inspecting and testing requirements.

B. Disinfection, Flushing, and Sampling:

1. Pipeline

a. Disinfect pipeline installation in accordance with AWWA C651.

b. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is no higher than that generally prevailing in existing system or is acceptable for domestic use.

c. Disposal:
   1) Legally dispose of chlorinated water.
   2) When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.
   3) After final flushing and before pipeline is connected to existing system or placed in service, employ an approved independent testing laboratory to sample, test, and certify that water quality meets quality standards of North Carolina Department of Environmental Quality.

2. Backwash Equalization Tank

   a. Disinfect tank installation in accordance with AWWA C652-11.
   b. Upon completion of retention period for disinfection, flush tank until chlorine concentrated water has completely left the tank.
   c. Disposal:
      1) Legally dispose of chlorinated water.
      2) When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.
      3) After final flushing and before tank is placed in service, employ an approved independent testing laboratory to sample, test, and certify that water quality meets quality standards of North Carolina Department of Environmental Quality.

3. RO Equipment

   a. All RO piping and equipment must be disinfected prior to being put into service. **Membranes shall not be loaded into pressure vessels during the disinfection process**.
   b. Piping shall use AWWA C651
   c. Upon completion of retention period required for disinfection, flush pipeline until chlorine concentration in water leaving pipeline is not detected.
   d. Disposal:

      1) Legally dispose of chlorinated water.
      2) When chlorinated discharge may cause damage to environment, apply neutralizing chemical to chlorinated water to neutralize chlorine residual remaining in water.
      3) After final flushing and before pipeline is connected to existing system or placed in service, employ an approved independent testing laboratory to sample, test, and certify that water quality meets quality standards of North Carolina Department of Environmental Quality.

END OF SECTION 331300

Section 400563 – Ball Valves

SECTION 400563 - BALL VALVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Rubber-seated ball valves.
2. Plastic ball valves.
3. High Pressure manually operated valves
4. Vee-Port ball control valves

B. Related Requirements:

1. Section 220523 “General-Duty Valves for Plumbing Piping”: Miscellaneous plumbing valves as required by Project.

2. Section 400551 “Common Requirements for Process Valves”: Basic materials and methods related to valves commonly used for process systems.

1.3 SUBMITTALS

A. As specified in Section 400551 “Common Requirements for Process Valves”: Submittal requirements for compliance with this Section.

1.4 QUALITY ASSURANCE

A. Test valves in accordance with AWWA C504, API 598, MSS SP61 as applicable for types listed herein.

B. Provide Installation Inspection and Operator Training per Section 400551 “Common Requirements for Process Valves.”

C. Provide testing and inspection certificates.

PART 2 - PRODUCTS

2.1 AWWA RUBBER-SEATED BALL VALVES - Tag Type BV1

A. Manufacturers:

1. Pratt, Val-Matic.
2. Substitutions: As specified in Section 016000 “Product Requirements”.

B. 4 Inches through 60 Inches:

1. AWWA C507, Class 150.
2. Minimum Working Pressure: As indicated on valve schedule.
3. Design minimum fluid velocity: 35 feet per second.
4. Maximum Process Fluid Temperature: As indicated on valve schedule.
5. Body:
   a. Material: Ductile iron, ASTM A536.
   b. Seats: Rubber.
6. Ball:
   a. Material: Ductile iron, ASTM A536.
   b. Surfacing: Stainless steel Nickel-chrome.
7. Bearing Seal, O-Rings, and Packing: Buna-N.
8. Shaft and Attachment Pins: Type 316 stainless steel.
9. Bearings: PTFE-lined with fiberglass backing.
10. Shaft Seals: Self-lubricating and self-adjusting.
11. Connecting Hardware: Type 316 stainless steel.
12. End Connections:
    a. Flanged: Comply with ASME B16.1.
13. Operator: As indicated on approved Drawings or associated details.

2.2 THERMOPLASTIC BALL VALVES – Tag Type BV2

A. Manufacturers:

1. Spears.
2. Substitutions: None allowed

B. Description:

1. Minimum Working Pressure: As indicated on valve schedule.
2. Maximum Process Fluid Temperature: 150 deg. F.
3. Ports: Full size.
4. End Connections:
   a. Flanged: Comply with ASME B16.1.
   b. Union.
5. Ball valves for chlorine gas and chlorine solution shall be vented type. Valves shall be vented to the upstream side of the valve.

C. Operator: As indicated on approved Drawings or associated details.

D. Materials:

1. Body and Ball: PVC, ASTM D1784; CPVC, ASTM D1784; Polypropylene, ASTM D4101; PVDF, ASTM D3222.
2. Seats: PTFE.

E. Locks: As indicated on approved Drawings or associated details.

2.3 HIGH PRESSURE MANUALLY OPERATED BALL VALVES- Tag Type BV3

A. Manufacturers:

1. Apollo
2. Nibco
3. Substitutions: As specified in Section 016000 “Product Requirements”.

B. Description:

1. Comply with MSS SP 72, ANSI B16.10, B16.34, B16.5, ASTM A380
2. Cleaned, tested, and passivated per ASTM A380
3. Minimum Working Pressure: 200 psi
4. Body: unibody or two piece, bolted
5. Ball: full port, floating, self-adjusting.
6. Seats: Resilient and replaceable
7. Stem: blow out proof, O ring sealed.
8. End Connections: ANSI Class 150 Flange

C. Actuator:

1. Lever.

D. Materials:

1. Body: ASTM A351 CF8M Type 316 SS.
2. Ball: ASTM A276 Type 316 SS
3. Seats: PTFE
4. Stem: 316 SS
5. Stem Seal: PTFE

2.4 VEE-PORT BALL CONTROL VALVES (TAG VPBV)

A. Service: Use V-port ball valves for flow-modulating applications on the RO membrane units’ valves, as shown on the Drawings.

1. RO Feed water control valve
2. Concentrate control valve
3. Stage one permeate backpressure valve

B. Manufacturers:

1. Flowserve/Valtek,
2. Fisher,
3. DeZurik,
4. Flowtek,
5. Tyco
6. Substitutions: As specified in Section 016000 “Product Requirements”.

C. Description:

1. Comply with MSS SP 25, ANSI B16.10, B16.34, B16.5, ANSI/FCI 70.2, ASTM A380
2. Cleaned, tested, packaged per ASTM G93.
3. Passivated per ASTM A380
4. Minimum Working Pressure: 250 psi
5. Maximum Temperature Rating: 150 Deg. F.
6. Body: unibody
7. Ball: v-port, floating, self-adjusting.
8. Seats: reinforced, replaceable, ANSI Class VI shut-off.
9. Stem: blow out proof, O ring sealed. removable bottom shaft cover for maintenance purposes
10. End Connections: ANSI Class 150 Flange, Raised Faced
11. Stem Seals/Packing:
    a. Multiple Chevron Rings
    b. mechanically retained
12. Bearings: Type 316 or 317 SS with PTFE bonded fabric or filament wound glass with Teflon lining.

D. Actuator:

1. Electric, modulating, as specified in Section 400557 “Actuators for Process Valves and Gates.”

E. Materials:

1. Body: ASTM A351 CG8M Type 317 SS or ASTM A351 CF8M Type 316 SS.
2. Ball: ASTM A351 CF8M Type 317 SS with Tungsten Carbide Overlay
3. Seats: Reinforced PTFE
4. Seat Ring: RPTFE/Graphite
5. Stem: 17-4 PH SS
6. Stem Seal/Packing: PTFE

2.5 SOURCE QUALITY CONTROL

A. Section 014000 “Quality Requirements”: Requirements for testing, inspection, and analysis.

B. As specified in Section 400551 “Common Requirements for Process Valves”.

C. Testing: Test ball valves according to AWWA C507.

PART 3 - EXECUTION

3.1 INSPECTION

A. As specified in Section 400551 “Common Requirements for Process Valves”: Submittal requirements for compliance with this Section.

3.2 INSTALLATION

A. According to AWWA C507.

B. As specified in Section 400551 “Common Requirements for Process Valves”.

END OF SECTION 400563

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
VPBV-4211	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 1	Provided by MSS[2]
VPBV-4221	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 2	Provided by MSS
VPBV-4231	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 3	Provided by MSS
VPBV-4241	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 4	Provided by MSS
VPBV-4251	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 5	Provided by MSS
VPBV-4261	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 6	Provided by MSS
VPBV-4271	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 7	Provided by MSS
VPBV-4281	16	VPBV	modulating	electric	RO Feed Water Control Valve RO Membrane Unit 8	Provided by MSS
VPBV-4215	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 1	Provided by MSS
VPBV-4225	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 2	Provided by MSS
VPBV-4235	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 3	Provided by MSS
VPBV-4245	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 4	Provided by MSS
VPBV-4255	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 5	Provided by MSS
VPBV-4265	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 6	Provided by MSS

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
VPBV-4275	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 7	Provided by MSS
VPBV-4285	12	VPBV	modulating	electric	Stage 1 Permeate Backpressure Valve RO Membrane Unit 8	Provided by MSS
VPBV-4219	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 1	Provided by MSS
VPBV-4229	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 2	Provided by MSS
VPBV-4239	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 3	Provided by MSS
VPBV-4249	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 4	Provided by MSS
VPBV-4259	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 5	Provided by MSS
VPBV-4269	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 6	Provided by MSS
VPBV-4279	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 7	Provided by MSS
VPBV-4289	6	VPBV	modulating	electric	Concentrate Control Valve RO Membrane Unit 8	Provided by MSS
BV-4960	1	BV-3	open/closed	manual	RO Permeate Feed for Carbon Dioxide System - Drain	
SV-4940A	1	BV-3	open/closed	solenoid	Carbon Dioxide Gas Feed to Solution Feed enclosure	COSS[3]
SV-4940B	1	BV-3	open/closed	solenoid	Carbon Dioxide Gas Feed to Solution Feed enclosure	COSS
SV-4940C	4	BV-3	open/closed	solenoid	Carbon Dioxide Solution Feed System	COSS
BV-4101A	1"	BV-1	open/closed	manual	RO Feed Pump 1 Pressure Gauge	
BV-4101B	1"	BV-1	open/closed	manual	Cartridge Filter 1 Inlet Pressure Gauge	
BV-4101C	1"	BV-3	open/closed	manual	Cartridge Filter 1 Outlet Pressure Gauge	
BV-4102A	1"	BV-1	open/closed	manual	RO Feed Pump 2 Pressure Gauge	
BV-4102B	1"	BV-1	open/closed	manual	Cartridge Filter 2 Inlet Pressure Gauge	
BV-4102C	1"	BV-3	open/closed	manual	Cartridge Filter 2 Outlet Pressure Gauge	
BV-4103A	1"	BV-1	open/closed	manual	RO Feed Pump 3 Pressure Gauge	
BV-4103B	1"	BV-1	open/closed	manual	Cartridge Filter 3 Inlet Pressure Gauge	
BV-4103C	1"	BV-3	open/closed	manual	Cartridge Filter 3 Outlet Pressure Gauge	
BV-4104A	1"	BV-1	open/closed	manual	RO Feed Pump 4 Pressure Gauge	
BV-4104B	1"	BV-1	open/closed	manual	Cartridge Filter 4 Inlet Pressure Gauge	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4104C	1"	BV-3	open/closed	manual	Cartridge Filter 4 Outlet Pressure Gauge	
BV-4106A	1"	BV-1	open/closed	manual	RO Feed Pump 6 Pressure Gauge	
BV-4106B	1"	BV-1	open/closed	manual	Cartridge Filter 6 Inlet Pressure Gauge	
BV-4106C	1"	BV-3	open/closed	manual	Cartridge Filter 6 Outlet Pressure Gauge	
BV-4107A	1"	BV-1	open/closed	manual	RO Feed Pump 7 Pressure Gauge	
BV-4107B	1"	BV-1	open/closed	manual	Cartridge Filter 7 Inlet Pressure Gauge	
BV-4107C	1"	BV-3	open/closed	manual	Cartridge Filter 7 Outlet Pressure Gauge	
BV-4108A	1"	BV-1	open/closed	manual	RO Feed Pump 8 Pressure Gauge	
BV-4108B	1"	BV-1	open/closed	manual	Cartridge Filter 8 Inlet Pressure Gauge	
BV-4108C	1"	BV-3	open/closed	manual	Cartridge Filter 8 Outlet Pressure Gauge	
BV-4109A	1"	BV-1	open/closed	manual	RO Feed Pump 9 Pressure Gauge	
BV-4109B	1"	BV-1	open/closed	manual	Cartridge Filter 9 Inlet Pressure Gauge	
BV-4109C	1"	BV-3	open/closed	manual	Cartridge Filter 9 Outlet Pressure Gauge	
BV-4002B	3	BV-2	open/closed	manual	Carrier Water Pump No. 2 Discharge	
BV-4002A	3	BV-2	open/closed	manual	Carrier Water Pump No. 2 Suction	
BV-4000	3	BV-2	open/closed	manual	Carrier Water Header	
BV-4003	3	BV-2	open/closed	manual	Carrier Water Suction Header	
BV-4001A	3	BV-2	open/closed	manual	Carrier Water Pump No. 1 Suction	
BV-4001B	3	BV-2	open/closed	manual	Carrier Water Pump No. 1 Discharge	
BV-4600A	3	BV-2	open/closed	manual	Antiscalant Fill Pipe Isolation Valve	
BV-6705	2	BV-2	modulating?	electric	Fluoride Feed System	
BV-6710A	2	BV-2	open/closed	manual	Fluoride Feed System	
BV-6710B	2	BV-2	open/closed	manual	Fluoride Feed System	
BV-6710C	2	BV-2	open/closed	manual	Fluoride Feed System	
BV-6720A	2	BV-2	open/closed	manual	Fluoride Feed System	
BV-6720B	2	BV-2	open/closed	manual	Fluoride Feed System	
BV-7010	2	BV-2	open/closed	manual	Gravity thickening and recycle pump station (sump pump discharge)	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4606	2	BV-2	open/closed	manual	Antiscalant Pad Drain	
BV-4802A	2	BV-2	open/closed	manual	RO Lime Feed System - Fill	
BV-4802B	1	BV-2	open/closed	manual	RO Lime Feed System - Fill Drain	
BV-4802C	1	BV-2	open/closed	manual	RO Lime Dilution Water - Drain	
BV-4895	2	BV-2	open/closed	manual	RO Lime Containment Drain	
BV-4920A	2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4920B	2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4920C	2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4506A	2	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-4506B	2	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-4507A	2	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-4507B	2	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-4508	1.25	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-4509	1.25	BV-2	open/closed	manual	RO Cleaning Eductor System	
BV-XXXX	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-XXXX	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-7217	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-7218	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-7209	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-7210	1	BV-2	open/closed	manual	Thickener Feed Pump Station	
BV-6711A	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6711B	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6711C	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6711D	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6711E	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6712A	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6712B	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6712C	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6712D	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-6712E	1	BV-2	open/closed	manual	Fluoride Feed System	
BV-3090	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	West Filters 5 to 8	
BV-3100	1	Bronze Ball Valve per See Section	open/closed	manual	West Filters 5 to 8	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
		220523.12				
BV-3110	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	West Filters 5 to 8	
BV-3120	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	West Filters 5 to 8	
BV-3130	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	East Filters 5 to 8	
BV-3140	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	East Filters 5 to 8	
BV-3150	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	East Filters 5 to 8	
BV-3160	1	Bronze Ball Valve per See Section 220523.12	open/closed	manual	East Filters 5 to 8	
BV-4001	1	BV-2	open/closed	manual	RO Raw Water Panel Isolation Valve	
BV-4112B	1	BV-3	open/closed	manual	RO Feed Water Panel Pressure Gauge - Units 6-10	
BV-4111B	1	BV-3	open/closed	manual	RO Feed Water Panel Pressure Gauge - Units 1-5	
BV-4600B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4600C	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605C	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605F	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605G	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605E	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605	1	BV-2	open/closed	manual	Reverse Osmosis System	
BV-4601	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4602A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4602B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4602C	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4605D	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4603A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4603B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4603C	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4604B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4604A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4610A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4610B	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4612A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4612B	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4612C	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4611A	1	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4710A	1	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4710B	1	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4710C	1	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4810A	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4810B	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4811A	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4811B	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4812A	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4812B	1	BV-2	open/closed	manual	RO Lime Feed System	
BV-4813A	1/2	Bronze Ball Valve per See Section 220523.12	open/closed	manual	RO Lime Dilution Water - Pressure Gauge Isolation	
BV-4800	2	BV-2	open/closed	Motor	RO Lime Dilution Water	
BV-4801A	2	BV-2	open/closed	manual	RO Lime Feed System - Fill	
BV-4801B	1	BV-2	open/closed	manual	RO Lime Feed System - Fill Drain	
BV-4801C	1	BV-2	open/closed	manual	RO Lime Dilution Water- Drain	
BV-4801D	2	BV-2	open/closed	manual	RO Lime Feed System - Calibration Column Isolation	
BV-4430A	1	BV-2	open/closed	manual	RO Lime Injection Fitting	
BV-4430B	1	BV-2	open/closed	manual	RO Lime Injection Fitting	
BV-4430C	1	BV-2	open/closed	manual	RO Lime Injection Fitting	
BV-4900	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4900A	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4900B	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4900C	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4900D	1 1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4900E	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4900F	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4930A	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4930B	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4940A	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4940B	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940C	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4940D	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940E	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940F	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940G	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940H	1	BV-3	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4940J	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4940K	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4940L	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Switch Isolation	COSS
BV-4940M	1/2	BV-3	open/closed	manual	RO Carbon Dioxide Feed System - Pressure Gauge Isolation	COSS
BV-4723	3/4	BV-2	open/closed	manual	Antiscalant Feed Injection Point	
BV-4623	3/4	BV-2	open/closed	manual	Sodium Bisulfite Feed Injection Point	
BV-4005A	3/4	BV-2	open/closed	manual	Spare Port RO Pretreatment Chemicals	
BV-4005D	3/4	BV-2	open/closed	manual	Spare Port RO Pretreatment Chemicals	
BV-4611D	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4611E	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4611B	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4621	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4610C	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4623	3/4	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4712B	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4711C	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4711D	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4711E	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4711B	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4721	3/4	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4910	5/8	To Be Selected by COSS	open/closed	manual	RO Carbon Dioxide Feed System	COSS
BV-4112A	1”	BV-3	open/closed	manual	RO Feed Water Panel Inlet - Units 6-10	
BV-4111A	1”	BV-3	open/closed	manual	RO Feed Water Panel Inlet - Units 1-5	
BV-3510	1”	BV-1	open/closed	manual	Filter backwash system	
BV-3520	1”	BV-1	open/closed	manual	Filter backwash system	
BV-4400	1”	BV-3	open/closed	manual	RO Permeate Water Panel	
BV-4410	1”	BV-1	open/closed	manual	RO Concentrate Water Panel	
BV-4212	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Feed Pressure Gauge	Provided by MSS
BV-4213A	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4218	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Concentrate Pressure Gauge	Provided by MSS
BV-4216	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4215A	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4215B	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Combined Permeate Pressure Gauge	Provided by MSS
BV-4222	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Feed Pressure Gauge	Provided by MSS
BV-4223A	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4228	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Concentrate Pressure Gauge	Provided by MSS
BV-4226	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4225A	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4225B	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Combined Permeate Pressure Gauge	Provided by MSS
BV-4232	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Feed Pressure Gauge	Provided by MSS
BV-4233A	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4238	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Concentrate Pressure Gauge	Provided by MSS

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4236	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4235A	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4235B	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Combined Permeate Pressure Gauge	Provided by MSS
BV-4242	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Feed Pressure Gauge	Provided by MSS
BV-4243A	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4248	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Concentrate Pressure Gauge	Provided by MSS
BV-4246	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4245A	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4245B	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Combined Permeate Pressure Gauge	Provided by MSS
BV-4252	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Feed Pressure Gauge	Provided by MSS
BV-4253A	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4258	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Concentrate Pressure Gauge	Provided by MSS
BV-4256	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4255A	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4255B	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Combined Permeate Pressure Gauge	Provided by MSS
BV-4262	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Feed Pressure Gauge	Provided by MSS
BV-4263A	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4268	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Concentrate Pressure Gauge	Provided by MSS
BV-4266	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4265A	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4265B	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Combined Permeate Pressure Gauge	Provided by MSS
BV-4272	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Feed Pressure Gauge	Provided by MSS
BV-4273A	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4278	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Concentrate Pressure Gauge	Provided by MSS

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4276	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4275A	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4275B	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Combined Permeate Pressure Gauge	Provided by MSS
BV-4282	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Feed Pressure Gauge	Provided by MSS
BV-4283A	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Stage 1 Concentrate Pressure Gauge	Provided by MSS
BV-4288	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Concentrate Pressure Gauge	Provided by MSS
BV-4286	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Stage 3 Feed Pressure Gauge	Provided by MSS
BV-4285A	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Stage 1 Permeate Pressure Gauge	Provided by MSS
BV-4285B	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Combined Permeate Pressure Gauge	Provided by MSS
BV-4515A	1”	BV-2	open/closed	manual	Cleaning System Cartridge Filter Pressure Differential Gauge	
BV-4515B	1”	BV-2	open/closed	manual	Cleaning System Cartridge Filter Pressure Differential Gauge	
BV-4515C	1”	BV-2	open/closed	manual	Cleaning System Cartridge Filter Sample Tap	
BV-4520	1”	BV-3	open/closed	manual	RO Cleaning System Pressure Gauge	
BV-4535	1”	BV-2	open/closed	manual	Permeate Flush Pump Discharge Pressure Gauge	
BV-4701A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4701C	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4701B	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4702A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4702C	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4702B	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4700	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4700B	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4703A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4703B	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4703C	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4704B	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4704A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4712A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4711A	1 1/2	BV-2	open/closed	manual	RO Bisulfite Feed System	

	Ball Valve Schedule					
Valve Designation	Size (inches)	Valve Type	Operator Type	Actuator Type	Service	Supplier[1]
BV-4214A	1”	BV-3	open/closed	manual	RO Membrane Unit 1 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4224A	1”	BV-3	open/closed	manual	RO Membrane Unit 2 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4234A	1”	BV-3	open/closed	manual	RO Membrane Unit 3 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4244A	1”	BV-3	open/closed	manual	RO Membrane Unit 4 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4254A	1”	BV-3	open/closed	manual	RO Membrane Unit 5 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4264A	1”	BV-3	open/closed	manual	RO Membrane Unit 6 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4274A	1”	BV-3	open/closed	manual	RO Membrane Unit 7 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4284A	1”	BV-3	open/closed	manual	RO Membrane Unit 8 Stage 2 Concentrate Pressure Gauge	Provided by MSS
BV-4010	2”	BV-2	open/closed	manual	RO Carrier Water Air Bleed	
BV-4011	2”	BV-2	open/closed	manual	RO Carrier Water Air Bleed	
BV-4012	3”	BV-2	open/closed	manual	RO Carrier Water Air Bleed	
BV-4613	3/4"	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4614	3/4"	BV-2	open/closed	manual	RO Anti-Scalant Feed System	
BV-4704C	1 1/2”	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4711F	3/4"	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-4722	3/4"	BV-2	open/closed	manual	RO Bisulfite Feed System	
BV-6400	2”	BV-2	open/closed	manual	Chlorine Dioxide Batch Tank Fill Line	

Notes:
1 If Alternate #4 is selected, remove all BFVs associated with the RO system, including: RO membrane units, feed system, permeate and membrane backpressure, cleaning and flushing system, concentrate control, chemical systems (carbon dioxide, lime, antiscalant, and bisulfite), cartridge filters, carrier water piping, and RO panel piping.
2 MSS = Membrane System Supplier
3 COSS = Carbon Dioxide System Supplier

Response to Questions Received During Bidding Phase

RESPONSE TO QUESTIONS RECEIVED DURING BIDDING PHASE

1. QUESTION: Regarding valve selection: It has come to our attention that the RO system will not work properly if certain valve types are selected as per the P&ID. May the MSS have the authority to provide a system with valve types differing from the P&ID?
   RESPONSE: *We anticipate the RO system will function properly with the proposed valves. We are amenable to fielding questions for specifics valves the MSS believes will hinder RO system functioning. Please develop a proposal using the valves required in the plans and specifications. If there is a conflict, please refer to the contract language for precedence.*

2. QUESTION: The title of Specification Section 331300.01 – Disinfecting of Water Process Basins appears to be for disinfecting structures; however, all the references in the specification is for process piping and valves. Special Procedures for Maintenance of Plant Operations and Sequence of Construction Specification Section Para 013513.54.1.4.H.4 calls for developing disinfection plan for filter boxes. Please provide specifications listing treatment criteria for disinfecting the structures and list any structure other than filter boxes that needs to be disinfected via addendum.
   RESPONSE: *Backwash Equalization Tank disinfection procedures have been added to Section 331300.01. See Section 466113, Paragraph 3.4 for disinfecting the filter media and underdrains.*

3. QUESTION: It is our interpretation that the Recycle Pump Station can be shut down for as long as necessary to perform the work required inside and to demolish and reinstall the effluent pipeline running out of the west wall. If this is incorrect, please provide the MOPO parameters necessary to estimate any temporary operations that may be required
   RESPONSE: *The recycle pumping equipment is currently not in service; however, the effluent flow from the lagoon passes through the Recycle PS wetwell structure and into the outfall discharge piping. In order to work inside the Recycle pump station wetwell, the lagoon effluent flow would need to bypass the station. The Contractor should plan on using temporary bypass piping and/or pumping to allow for work in the wetwell.*

4. QUESTION: It is our interpretation that the Owner will isolate and drain the Recycle Pump Station prior to the Contractor performing any work inside it. If this is incorrect, please notify us via addendum.
   RESPONSE: *The Contractor should plan on using bypass pumping to allow for work inside the Recycle PS wetwell. The Contractor will be required to drain and clean the pump station wetwell, as necessary, to perform the required improvements*

5. QUESTION: Similarly, it is our interpretation that the Owner will isolate and drain the Sludge EQ Basin prior to the Contractor the required modifications and that the Basin can be shut down for the duration necessary to perform the work. If this is incorrect, please notify us via addendum and provide the necessary MOPO parameters to estimate any temporary operations that may be required.
   RESPONSE: *The Owner will be responsible for isolating, draining and cleaning the EQ Basin (as necessary) to allow for the Contractor to perform required improvements. Time allowed for work within the basin will be limited, as determined by the Owner, with the allowable duration dependent on the plant operating conditions at that time.*

6. QUESTION: It is our interpretation that the PVC Distribution and Collection laterals at the Clarifiers are to only require supports as indicated on the drawings and that the spacing requirements for the support of PVC pipe given in Specification Section 400507 does not apply. Additionally, there are no supports indicated for the PVC Sludge drawoff piping and locations in the central sludge drawoff zone where there are no means of providing supports to meet requirements provided in Section 400507. It is our interpretation that all sludge drawoff piping interior to Clarifiers is to be supported as spacings and locations recommended by the Clarifier manufacturer. If either of these are not correct, please notify us via addendum and provide revised drawings indicating lateral and sludge pipe support requirements.
   RESPONSE: *Collection lateral supports shall be designed and furnished by the System Supplier per Section 464361, Paragraph 2.3D. The sludge draw-off pipes shall be supported off the concentrators using appropriate Type 304 stainless steel wall brackets and/or pipe hangers per Section 464361, Paragraph 2.3E.2. Distribution lateral supports to be concrete blocks. Spacings and locations of all supports to be recommended by the System Supplier. Specification revised per this Addendum.*

7. QUESTION: Please refer to Note 6 on Contract Drawing M-CL-13 and Paragraph 2.3.A.2 of Section 46 43 61 which detail the vortex breaker which is to be installed on the new 30" RW piping in the Vortex Chamber of each Clarifier Basin. Given work period constraints associated with the Clarifier Basins in Section 013513.54, the first set of Clarifier Basin repairs will be required to be complete by February 28, 2021. The new 30" RW piping will require the new Filter and Rapid Mix facilities to be operational, which will not occur by February 28, 2021. As such, the modified/repaired Clarifier Basin will need to be fed via the 20" RW piping from the existing Rapid Mix facilities as contemplated by Notes 4 & 6 on Contract Drawing M-CL-4. It is our understanding that it is acceptable to operate modified/repaired Clarifier Basin via the existing 20" RW piping without means of a vortex breaker. If this is incorrect, please notify us via addendum.
   RESPONSE: *This understanding is confirmed.*

8. QUESTION: Please refer to Paragraph 1.4.Q of Section 013513.54 which states that a second PLC installed on a temporary basis is required for the sequenced repair/modification work of the Clarifiers. Per the Contract Documents, the East Clarifier Basin repair/modifications are to include new PLC Panel (PLCNWTP-7) and the West Clarifier Basin repair/modifications are to include new PLC Panel (PLCNWTP-8). It is our understanding that if these new PLC Panels are installed as part of the repair/modifications to their respective Clarifier Basins and that if at least one fiber optic network communication connection is made between these panels and an operational PLC panel on the SCADA/control network (full fiber optic ring not necessary for interim operation) then a temporary second PLC is not required. If this is incorrect, please notify us via addendum and provide further details on the requirements of the temporary second PLC.
   RESPONSE: *This understanding is confirmed.*

9. QUESTION: Please reference Specification 466323.13 page 4, Section 1.04 SUBMITTALS, A.9. We assume the chlorine and chloramine tolerant requirements are not applicable to this project, and are a carry-over from a previous project specification.
   RESPONSE: *These requirements have been removed.*

10. QUESTION: The SST Gate Schedule in Specification Section 400559.23 indicates for weir gates WG-1015/6/7/8 to be self-contained but Drawing M-RM-2 illustrate these gates as if they are not self-contained with pedestal type actuators. It is our interpretation that these weir gates are to be self-contained. If this is not correct, please notify us via addendum and provide a revised SST Gate Schedule.
    RESPONSE: *WG-1015, 1016, 1017 and 1018 will be self-contained weir gates.*

11. QUESTION: The Butterfly Valve Schedule in Specification Section 40 05 64 states that the pneumatic butterfly valves associated with the Filter System are to be Type BFV1 with flanged bodies, but Specification Section 466123.11-2.4L states they are to be wafer body style. It is our interpretation that Filter System pneumatic valves are to be provided per 466123.11-2.4L. If this is not correct, please notify us via addendum and provide revised specifications.
    RESPONSE: *Section 466123 has been modified to clarify.*

12. QUESTION: Section 2 on Drawing M-CL-12 depicts the 6" PVC sludge pipe with flanges as if it were ductile pipe. It is our interpretation that flanges will only be required on this PVC line where necessary to connect to the valves. If this is not correct, please notify us via addendum.
    RESPONSE: *The sludge extraction pipes shall be Schedule 80 PVC. Flanges shall be provided as needed for connecting to valves. Section 464361 has been modified to clarify.*

13. QUESTION: Section 3 on Drawing M-CL-13 indicates for the exterior Sludge pipe to be PVC, but Specification Section 464361-2.3E.1 states that the exterior sludge pipe is to be carbon steel. Additionally, Section 3 also states the plug valves are to be "PVC," but no specification exists for PVC plug valves. It is our interpretation that the exterior sludge piping is to be PVC and plug valves are to be iron body per Section 400562. If either of these are incorrect, please notify us via addendum and provide revised drawings and specifications.
    RESPONSE: *Plug valves shall be cast iron body per Section 400562. Sheet M-CL-13 has been modified to clarify.*

14. QUESTION: In Section 464361, 1.8D, Table 1, consider revising the effective settling area of each basin to 6,298 FT^2.
    RESPONSE: *While this numbers in this Table will not be changed, we note a typographical error in the table alignment. Please see updates to Section 464361.*

15. QUESTION: Section 464361, 1.8H indicates when plant flow is less than capacity of each train provided, use either of the two treatment trains. Please consider instead operating all trains at all times, no matter the flow. If this is not acceptable, then ensure SuperPulsators continue to pulse when taken off-line to ensure the sludge bed remains "fluffy" and does not settle and compact at the bottom of the clarifier basin. Suez will provide guidance in O&M on how long each unit may remain offline with pulsing; and how long before the basin must be drained.
    RESPONSE: *Paragraph 1.8H.1 has been revised to indicate System Supplier to provide additional guidance.*

16. QUESTION: Please revise Section 464361, 1.10G to indicate clarified water will be collected at in collection launders and channels instead of at a single point in each clarifier.
    RESPONSE: *Paragraph 1.10G has been revised accordingly.*

17. QUESTION: Section 123553.13. indicates metal as the material to be used for the casework in Lab A-109, yet the plans on sheet A-RO-12 indicate wood part numbers to be used for the lab casework. Please confirm which material is to be used in Lab A-109 for the casework shown.
    RESPONSE: *Laboratory casework shall be wood casework. See this addendum.*

18. QUESTION: Paragraph 123553.13-2.6 A.1a Indicates Durcon as the basis of design for epoxy resin countertops. Please confirm that Kewaunee Scientific is an acceptable manufacturer for the epoxy resin countertops.
    RESPONSE: *Kewaunee Scientific countertops are acceptable. See this addendum.*

19. QUESTION: Specification Section 464361, Paragraph 1.10H.2, delete “The performance requirements shall overlap with equipment warranty.”
    RESPONSE: *Deletion is approved, specification revised per this Addendum.*

20. QUESTION: Specification Section 464361, Paragraph 1.12E.5, delete “… If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the Owner.”
    RESPONSE: *Deletion is approved, specification revised per this Addendum.*

21. QUESTION: Specification Section 464361, Paragraph 2.3D.1. we note “Collection Lateral supports are 316SS, while Distribution lateral supports are 304SS.” Please note the equipment for these two support systems is identical, so care will be needed in shipment and storage at the site to ensure the GC knows which is which, and where each is to be installed
    RESPONSE: *Requirement for shipment and storage of collection and distribution lateral supports is noted, specification revised per this Addendum.*

22. QUESTION: Specification Section 464361, Paragraph 2.3E.2, Sludge withdrawal supports are specified Type 304SS wall brackets and/or pipe hangers; however, are within 2-feet of the water level. Shall we supply SS316?
    RESPONSE: *316SS for sludge withdrawal supports is approved, specification revised per this Addendum.*

23. QUESTION: Section 3 on Drawing M-CL-13 states for the CA pipe to be copper, but all other drawings indicate for CA pipe to be HDPE. It is our interpretation that all CA piping is to be HDPE. If this is not correct, please notify us via addendum and provide revised drawings indicating transition in pipe material types.
    RESPONSE: *All CA pipe shall be HDPE, drawing revised per Addendum.*

24. QUESTION: Reference Drawing M-CL-3: Section 1 has a callout stating, "Existing stilling baffles (not shown) to be demolished (typ)". Please provide the dimensions of these baffles, quantity of baffles in each basin, and the materials in which these baffles are constructed of (wood, masonry block, plastic, concrete, etc).
    RESPONSE: *The existing stilling baffles are constructed from bent metal sheets. There are approximately 20 triangular shaped baffles per clarifier basin. Each baffle is approximately 24" high and runs the full length of the basin from the center wall to the north/ south basin wall.*

25. QUESTION: Parts of the existing 12" Drain are hatched inside the distribution channel on Drawing M-CL-2 signifying these segments are to be demolished. Looking at Section 2 on Drawing M-CL-3, these same segments of the 12" Drain are not hatched. It is our understanding that these existing 12" Drain lines are to remain as is and no demolition is required. Please address in a future addendum if this is incorrect.
    RESPONSE: *The existing 12" drain pipes in the distribution channels will not be demolished. A SS cover plate will cover the drain openings in each distribution channel as shown on M-CL-7 and M-CL-8.*

26. QUESTION: What is the location of plug valve PV-7214, shown in the pipe schedule?
    RESPONSE: *Delete PV-7214 from valve schedule table, per this addendum.*

27. QUESTION: The specs and drawings are calling for a 3250kW at 480V. CATERPILLAR does not have a unit in this size range and in order to quote the next size up (3900kW), we could only offer a 4160V alternator. This, as you mentioned earlier in 2019, is not desired by the customer. We would like to propose a 3000kW, 480V unit from CAT. The CAT controller inherently offers a kW relay to send a signal if overloaded as well as additional provisions can be added to monitor load levels which we could add. Please advise if a 3000KW would be considered by the design team and customer.
    RESPONSE: *3000kW is not acceptable.*

28. QUESTION: The Air Release Valve Schedule in Specification Section 40 05 78.10 indicates for a "Hood" to be provided for one of the AVRVs at the Backwash EQ Basin shown on M-BET-2, but does not state for a "Hood" to be provided on the other valves of identical installation at this structure and no information is provide regarding this hood. It is our interpretation that this note was included in error and can be deleted. If this is not correct, please notify us via addendum and provide revised specifications for hood.
RESPONSE: *An outlet hood with screen is required for both 3" AVRV's immediately upstream of the check valves at the backwash pumps. The Air Release Valve Schedule shall be revised accordingly.*

29. QUESTION: The Check Valve Schedules in Specification Sections 40 05 65.23, 40 05 65.33, and 40 05 65.35 do not contain CV-3510/3520 at the Backwash EQ Tank. Please provide revised Check Valve Schedule indicating applicable Check Valve Types for these valves.
RESPONSE: *CV-3510/3520 are Globe Body Silent Check Valves. Check Valve Schedule in Section 40 05 65.35 shall be revised accordingly.*

30. QUESTION: Regarding Section 463633, the drawings show a bulk bag unloader with a flexible screw conveyor, but they aren't mentioned in the specs.
RESPONSE: *See Addendum #5 for revised Section 463633 and drawings.*

31. QUESTION: Regarding Section 463633, if the bulk bag unloader is part of the project, is it forklift loaded, or loaded by an integral I-beam with trolley and hoist?
RESPONSE: *See Addendum #5 for revised Section 463633.*

32. QUESTION: Regarding Section 463633, there is no mention of a control panel in the specs.
RESPONSE: *See Addendum #5 for revised Section 463633.*

33. QUESTION: Regarding Section 463633, what kind of height room do we have to work with, provided the bulk bag unloader is part of the system?
RESPONSE: *See Addendum #5 for revised Section 463633.*

34. QUESTION: Regarding Section 463633, load cells are also shown in the drawing, but aren't mentioned in the specs.
RESPONSE: *See Addendum #5 for revised Section 463633.*

35. QUESTION: Detail B on Drawing M-D-4 indicates for a ball check valve to be installed prior to the chemical injection assembly, but no specifications were provided regarding ball check valves. Please provide applicable specifications via addendum.
RESPONSE: *Drawing M-D-4 has been updated to provide additional information on these ball check valves.*

36. QUESTION: Please advise what the (2) symbols represent on the 30" BWW line depicted on sheet M-FL-3. They appear to be solid sleeves but it doesn't appear they would be required at these locations.
    RESPONSE: *It is assumed that this question is in reference to the piping immediately upstream of the first 45 degree bend in each 30" BWW line. The approximately 2.5 ft MJ x MJ spool piece shown is not necessary and a single length of DI pipe (MJ x MJ) can be used to extend to the 90 degree bend at the center of each set of filters.*

37. QUESTION: Sheet M-FL-3 appears to depict (2) mechanical joint x plain end 45 bends on the 30" BWW line depicted on sheet M-FL-3. Please confirm (2) 30" mechanical joint x plain end 45 bends are required.
    RESPONSE: *All 45 degree bends on the 30" BWW line are intended to be MJ x MJ. The 45 degree bends in question are to be MJ x MJ.*

38. QUESTION: Please provide a scale for detail H on sheet M-D-5.
    RESPONSE: *Invert EL. of the 16" FTW pipe at fitting no. 454 referenced on sheet C-YP-5 is 47.9. With this additional information, a scaled drawing for Detail H on sheet M-D-5 is not needed.*

39. QUESTION: Detail "H" on Drawing M-D-5 calls for a custom fabricated splash guard at the end on the filter to waste air gap, details for what this is intended to be could not be found. Please provide a detail and specifications for the custom fabricated splash guard.
    RESPONSE: *Details for the custom-fabricated splash guard shall be added via addendum to the callout in Detail "H" on Drawing M-D-5.*

40. QUESTION: Drawing M-FL-1, 2, and Section 1/M-FL-4 show the 10"-AS-SS304 line coming from the West side of Filter Building and stopping. The callout leader states it is coming from the Existing Air Scour Blower, but there are not any details nor routing from the building to the blower. Please provide the location of the Existing Air Scour Blower referenced along with routing details and cut sections for the remainder of the line outside of the building.
    RESPONSE: *Callouts indicating location of connection to the existing air scour line and elevations along the outside walls of the clarifiers shall be added via addendum to C-YP-5.*

41. QUESTION: Drawing M-FL-3, Section 4/ M-FL-5, and table on page 9 of Spec 40 05 78.10 show a 1" ARV for the 16"-FTW-DI line but Drawing I-FL-2 shows a 3" AVRV for the same air valve. Please confirm the 1" ARV is the correct size and type air valve to provide
    RESPONSE: *The 1" ARV is the correct size and type air valve to provide.*

42. QUESTION: Drawing I-FL-2 shows an isolation valve (PV-3124) prior to the 3" AVRV mentioned in previous question, but it is not shown in the plug nor ball valve lists provided in the Specifications. Please confirm this valve is a 1" plug valve and add it to the plug valve list in Spec 40 05 62.
    RESPONSE: *PV-3124 is a 1" plug valve. This valve will be added to the plug valve list in Spec 40 05 62 via addendum.*