REMINGTON & VERNICK ENGINEERS

NOTICE OF ADDENDUM

BROWNING ROAD WATER TRETMENT PLANT IMPROVEMENTS

0424M081

MERCHANTVILLE PENNSAUKEN WATER COMMISSION (MPWC)
PENNSAUKEN TOWNSHIP, CAMDEN COUNTY

ADDENDUM NO. 2

Prospective Bidders for the BROWNING ROAD WATER TREATMENT PLANT IMPROVEMENTS for the PENNSAUKEN TOWNSHIP are hereby notified that **Addendum No. 2** has been issued. **Addendum No. 2** will become part of the Contract Documents.

Any Contract Specifications not containing Addendum No. 2 will be considered informal and non-responsive.

For Addendum No. 2, Clarifications and answers to questions presented by the Prospective Bidders

ADDENDUM NO. 2 consists of:

- Twenty-three (23) pages with clarifications and answers to questions presented by the Prospective Bidders
- Three (3) revised Specification Sections:
    1. Section 400566 "Valves and Piping Appurtenances"
    2. Section 463344 "Peristaltic Metering Pumps"
    3. Section 466616 "Closed-Vessel Low-Pressure-High -Intensity Ultraviolet Equipment"
- Five (5) additional Specification Sections:
    1. Section 066000 "PVC Paneling"
    2. Section 074113 "Metal Roofing Panels"
    3. Section 087000 "Finish Hardware"
    4. Section 099000 "Painting and Finishes"
    5. Section 400567 "Flow Control Valves"
- Revised Bid Form
- Two (2) Cut Sheets:
    1. Dosing Skid,
    2. Series LF909 Reduced Pressure Zone Assemblies
- One (1) Drawing: DWG No. ESK-1
- Seven (7) revised Plan Sheet: C-5, C-6, PP-1, PP-2, PP-3, D-1, D-3,

REMINGTON & VERNICK ENGINEERS

Copies of Addendum No. 2 have been emailed to all prospective bidders who have purchased a set of contract documents.

Sincerely,
REMINGTON & VERNICK ENGINEERS, INC.

By Dennis K Yoder

DENNIS K. YODER, P.E., C.M.E.
Principal – Director of Engineering

DATED: 4/9/2025

REMINGTON & VERNICK ENGINEERS

ADDENDA

BROWNING ROAD WATER TRETMENT PLANT IMPROVEMENTS

0424M081

MERCHANTVILLE PENNSAUKEN WATER COMMISSION (MPWC)
PENNSAUKEN TOWNSHIP, CAMDEN COUNTY

ADDENDUM NO. 2

You are hereby notified in accordance with the paragraph entitled "Addenda and Interpretations" of the above-captioned project that the following has been issued, and the conditions and specifications set forth in said addendum are to be considered as binding as if the same was set forth in the original contract documents.

Failure to use the attached Addendum No. 2 pages will result in rejection of the bid.

The following questions were presented by bidders and are being presented to all plan holders as an addendum:

ATTACH THIS CLARIFICATION TO SPECIFICATIONS WHEN SUBMITTING BID

1. *Which OH door spec do we go by? 08110 or 08330? Fyi they both talk about "steel" doors. Drawing schedule says "aluminum"*

   Response: Overhead doors to be steel as specified in Section 08330.

2. *IFB page 8 pp3.04 Permits states that contractors have to pay for permits. Is that accurate?*

   Response: Any construction or related permit fees will be reimbursable under the allowance line item in the bid form.

3. *Specs call for shingles, drawings show metal roofing. The metal roof details look to be Garland. Garland is prob 3-4 times more than a standard metal roof. Is that what we are using to bid? Also what is the ceiling material calls out PVC but no specification. Trusscore?*

   Response: The structural drawings call for metal roof panel system, and PVC paneling for the ceilings. Please see technical specifications Section 074113 Metal Roof Panels for metal roof panel system. In addition, Section 066000 PVC Paneling has been added to the technical specification set attached herein.

4. *Please clarify the following:*

   a. *Turbidity – the spec says 0-5 NTU, and our previous sizing was based on 1 NTU. This means more organic sand a higher scavenging demand.*
   b. *Design UVT – the spec says range from 70% to 100%, and our previous sizing for browning road was based on 96%*
   c. *1,4-dioxane – There is no influent concentration.*
   d. *Design UV dose and redundancy - it seems confusing they are asking for us to meet full redundancy and 100 mJ/cm2 at 65% UVT as this is not a disinfection job.*

   Response: Section 466616 – Closed-Vessel Low-Pressure/High-Intensity Ultraviolet Treatment equipment has been revised to indicate the following design parameters: turbidity = 1 NTU; design UVT= 96%. Based on water quality analysis the influent concentration of 1,4 Dioxane ranges from 1.48 µg/L (ppb) to 1.55 µg/L and at the POE ranges from 1.24 µg/L to 1.54 µg/L. "d" is not applicable.

5. *Please provide paint spec for chemical containment areas, clear coating required for floors and general painting (CMU walls, pipe, etc.)*

   Response: Section 099000 – Painting, and Finishes is added to the technical specification package and attached herein.

6. *SECTION 085113 - Call out TRACO TR-9900 Double Hung Side Load Thermal Aluminum Windows, drawing S-23 (Window Schedule) call out Glass Block windows. Which type of windows is to be furnished & installed?*

   Response: Please provide and install Glass Block Windows as indicated on the Structural Drawings.

7. *Please provide the manufacturer of the chemical storage tanks.*

   Response: Snyder Industries. Part Number 5990902N_01

8. *Please provide manufacturer of the Lime mixing tank.*

   Response: Pyrz Water Supply Co. Harleysville, PA or equal supplier.

9. *Is it the intension for the contractor to remove existing GAC media form existing tanks and install new GAC media (Owner supplied) when tanks are relocated?*

   Response: MPWC will be responsible for the removal and disposal of the existing carbon media from the existing GAC units before the relocation of the vessels, and adding new media

in the GAC units once relocated in the new building. The Contractor will be responsible for the complete relocation of the GAC vessels from the existing position (outdoor concrete pads) to the final location inside the proposed building, including sitting and leveling. Additionally, the Contractor shall make all the connections to insure a complete and functioning system.

10. *The bid form list 27 bid items but there is measurement and payment section for how you want us to break down our quote for the bid form. Please provide a measurement and payment section*

    Response: Any specification section that has a payment description that does not include a bid item shall be included in the price for the various items and priced out in the schedule of values submission

11. *Division 8 – Openings: 085133 – Aluminum Windows – Spec states all windows are 4 ½ " Double Hung Side Load Thermal Aluminum Window with insect screen – However on drawing S-23 the window schedule states they are 6' Glass block windows. Please provide clarification on which windows to bid.*

    Response: Provide and install Glass Block Windows as indicated on the Structural Drawings.

12. *Division 9 – Finishes: In scope of work T. – Painting schedule contained in section 099100, however no section exists in current specifications. Please provide a Division 9 specification section including the referenced painting schedule for bidding.*

    Response: Section 099000 – Painting, and Finishes is added to the technical specification package and attached herein.

13. *Please provide a detail for the transformer pad.*

    Response: PSE&G will be providing the pre-cast transformer pad.

14. *Please provide the depth of stone around the pad mounted transformer within the enclosure*

    Response: provide 12" of #67 stone with one (1) layer of geotextile fabric, Mirafi (or equal) filter fabric, below the stone. The Contractor shall coordinate the work to be performed with PSE&G.

15. *The site demolition plan does not indicate the removal of any asphalt, please confirm if the existing driveway, in the area of the new driveway is to be removed prior to installation of new pavement.*

    Response: Pavement of the new driveway is required. The removal of the existing asphalt shall be completed as part of the site demolition and the cost shall be included in the same line item.

16. *Door Spec Section 08200 provides the door and frame details but it is missing the necessary door hardware requirements. Please provide a door hardware spec for bidding*

Response: Section 087000 “Finish Hardware” is added to the technical specifications and attached herein.

17. *On drawing C-6 shows relocation of gas main please advise if Bid Item #26’s allowance will cover all costs and fees associated with this work.*

Response: Bid Item #25 “ALLOWANCE FOR COORDINATION WITH PSE&G FOR GAS LINE RELOCATION, MISCELLENEOUS FEES AND ALL WORK ASSOCIATED WITH THE GAS SERVICE” will cover all costs and fees associated with this work.

18. *The requirements in Specification Section 017900 Demonstration and Training: If video recording is truly required, please advise what equipment will require this.*

Response: Video recordings are not required.

19. *Specification 013233 Photographic Documentation: will you require both photos and recordings for preconstruction and monthly?*

Response: The preconstruction photos are for the Contractor’s protection. Photos and videos are required for the preconstruction phase only, not monthly.

20. *Can you please clarify the column material. Specification 051200 Section 2.11A calls for prefabricated building columns but there is also a structural stainless-steel framing specification and the drawing call for just W8x24 columns and a note on Drawing S-1.0 that says all exposed steel to be HDG or stainless unless otherwise shown.*

Response: Proceed with Structural Drawings for all Steel materials. All Metal shall be A992 Steel with HDG finishes unless noted on drawings such as Stainless Steel Bolts and Aluminum Beams.

21. *There are numerous references within the Division 5 specifications regarding testing by a testing agency. Since this is such a small steel job, can we assume a testing agency is not required? If it is required, please advise exactly what tests will be required (shop and field) and for what items and whose responsibility it will be as there are also numerous notes that it will be by the owner.*

Response: Third party testing is responsibility of the contractor per ICC

22. *Specification 051200 Section 1.6B says "Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE" . Since this is a very small steel job, can we assume that this will not be required and that the requirements of Section 051300 will suffice which states "Erector: Company experienced in erecting structural steel work similar to that indicated for the project who has a successful in-service performance with a minimum of 5 continuous years of experience"?*

    Response: This requirement is waived from contract requirements.

23. *There are a lot of exceptional fabricators that are not an AISC fabricator. Since this is a small steel job, can the fabricator be a non AISC fabricator?*

    Response: This requirement is waived from contract requirements.

24. *We assume that Specification 051300 Section 1.4B "Land Surveyor: A surveyor licensed in the State of Virginia who is qualified to determine and verify the top of steel elevations and the edge of slab locations for each elevated framed level and to verify the structure is square, plumb, and level in accordance with AISC tolerances" is not applicable at all to this project?*

    Response: The Land Surveyor requirements are not applicable to this project.

25. *051300 Section 2.4H Non-destructive testing and inspections. These requirements could cost the owner a lot of money on such a small steel job. Please advise if it is truly required.*

    Response: Non-destructive testing and inspections have been eliminated from contract requirements for this project.

26. *051300 2.4M post-installed anchor load testing Section 2.4M: ? "All post-installed anchors in existing concrete, where shown on documents" As nothing is shown, please confirm it is not required. If it is required what are the required loads to be applied to each anchor?*

    Response: Post-installed anchors load testing has been eliminated from the contract requirements for this project.

27. *Specification 055100 Metal Stairs Section 1.1A1 references concrete-filled treads which doesn't match up with the drawing details. We believe this is not required. Please advise.*

    Response: Concrete-fill treads have been eliminated from the contract requirements for this project.

28. *The drawings call out standing seam metal roof panels but the roofing specifications provided are for asphalt shingles. Please clarify.*

Response: Metal roof panels are required per technical specification Section No. #074133.

29. *There are two specification sections for overhead doors (both are for steel doors). The doors are called out as aluminum on the Drawing S-2.4 door schedule. Additionally, both spec sections reference motor operators. We assume they are manually operated as nothing is shown on the electrical drawings. Please clarify both items.*

Response: Steel doors are required, all five overhead doors are to be motor operated. See Electrical Dwg E-3.1.

30. *In addition to the above questions, there are named manufacturers listed in the specifications. We have encountered problems in the past with doors meeting the requirements of AIS. BABA requirements are much stricter. Please confirm if the named manufacturers are BABA compliant.*

Response: List of manufacturers is for basis of design only. Contractor shall submit overhead Doors which are equivalent to the technical specifications.

31. *In addition to the American Iron and Steel Act being applicable to this project , is this project subject to the Build American Buy American Act of 2021?*

Response: This project is subject to the Build America Buy America (BABA) requirements (Please refer to Appendix J of the General Conditions). Therefore, all manufacturers must be BABA compliant.

32. *Specification 085113 Aluminum Windows – please confirm if you want aluminum windows per this specification or glass block windows as shown on the drawings.*

Response: Contractor shall provide and install standard 8" glass block, Contractor to provide submittal prior to ordering materials.

33. *Please provide a painting specification along with a job specific schedule of what requires field painting*

Response: Section 099000 – Painting, and Finishes is added to the technical specification package and attached herein.

34. *The gas piping on Drawing C-5 shows new service from the road and tying into the existing service. The riser diagram on Drawing P-4.2 and plumbing Drawing P-3.1 shows the piping going to the new building including a meter. Will the new gas pipe go to the new building AND to the existing service tie-in point shown on C-5?*

Response: Yes, the new gas pipe will go to the new building (including meter) and to the existing tie-in point shown on C-5.

35. *In addition to the above gas service question, it is our interpretation of the plans and specifications that the new gas service (up to the tie-in and up to and including the meter) will be by the gas company and any associated costs charged by PSE&G will be paid under the allowance. The contractor is only responsible for the coordination. Can you please confirm this.*

Response: Confirmed. Contractor is responsible for coordination and installation downstream of the meter. Contractor shall provide concrete pad, supports, and other appurtenances as necessary to support the new meter set but not provided by the utility company.

36. *Specification 220523 General Duty Valves for Plumbing piping Section 3.2G "Provide an additional six (6) valves of each type and size used in the project to accommodate interferences and/or as directed by Engineer." We assume this is not applicable. If it is, please advise which valves specifically will be required.*

Response: This requirement shall apply to this project. Valves shall be as required by specification 220523 for each type and size of pipe used.

37. *Specification 220529 Hangers and Supports for Plumbing Piping and Equipment. The following items (a-c) are not generally provided with this trade but are typically installed per local building code. If required, this can be costly. Can these requirements be disregarded? If not, please clarify what exactly will be required.*
    a. *Section 1.4A: "Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated".*
    b. *Section 1.5B Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:*
    c. *Section 1.5C Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation"*

Response: Signed and sealed engineering analysis is required where performance requirements and design criteria for supports are specifically indicated.

38. *Specification 220548 Vibration and Seismic Controls for Plumbing Piping and Equipment. Mechanical and Electrical Seismic components are exempt per IBC and ASCE due to being a non-essential facility, risk category III. Please review and amend the seismic requirements.*

a. *Section 1.4B "Delegated-Design Submittal: For vibration isolation and seismic-restraint calculations and details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation and licensed in the State of New Jersey."*
b. *Section 1.5C "Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer"*

Response: Vibration and seismic restraint are not required when the building is not required by code to have seismic restraints for MEP equipment.

39. *Specification 220700 Plumbing Insulation Section 3.3I: "Provide an additional one hundred feet of preformed insulation and fifty square feet of blanket and board type insulation as well as accessories and labor for each size, thickness and type used on the project to accommodate any changes required to resolve interferences or as directed by the Engineer". We assume this is not applicable. If it is, it is impossible to price up. Please narrow down exactly what will be required including accessories or provide an allowance in the bid form to cover this.*

Response: Contractor shall include all costs for additional insulation as stated in the specifications.

40. *Specification 221116 Domestic Water Piping Section 3.2Q: "Provide an additional one hundred feet of piping and accessories and labor for each size of pipe used on the project to accommodate any changes required to resolve interferences or as directed by the Engineer." We assume this is not applicable. If it is, it is impossible to price up. Please narrow down exactly what will be required including accessories, fittings, etc.or provide an allowance in the bid form to cover this.*

Response: Contractor shall include an allowance in his bid for installation of additional insulation as stated in the specifications.

41. *Specification 221316 Sanitary Waste and Vent Piping Section 1.5B: "Design Calculations: Signed and sealed by a qualified professional engineer for selecting seismic restraints." Mechanical and Electrical Seismic components are exempt per IBC and ASCE due to being a non-essential facility, risk category III. Please review and amend the seismic requirements.*

Response: Vibration and seismic restraint are not required when the building is not required by code to have seismic restraints for MEP equipment.

42. *Specification 221316 Sanitary Waste and Vent Piping Section 3.3F: "Provide an additional one hundred feet of drainage and vent piping for each size used on the project to resolve interferences or as directed by the Engineer." Is this applicable?*

Response: Yes. Contractor shall include installation of additional materials in their bid.

43. *Specification 230529 Hangers and Supports for HVAC Piping Section The following items (a-c) are not generally provided with this trade but are typically installed per local building code. If required, this can be costly. Can these requirements be disregarded? If not, please clarify what exactly will be required.*
    a. *Section 1.4A: "Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated" and*
    b. *Section 1.5B "Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components…"*
    c. *Section 1.5C "Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation."*

    Response: Signed and sealed engineering analysis is required where performance requirements and design criteria for supports are specifically indicated. Hangers and supports shall be provided in accordance with applicable codes and standards and the manufacturer's recommendations.

44. *Specification 230548 Vibration and Seismic Controls for HVAC Piping and Equipment Section 1.3B: "Design Calculations: Calculate requirements for selecting vibration isolators and for vibration isolation bases. All calculations shall be signed and sealed by a professional Engineer licensed in the state of New Jersey." Mechanical and Electrical Seismic components are exempt per IBC and ASCE due to being a non-essential facility, risk category III. Please review and amend the seismic requirements.*

    Response: Vibration and seismic restraint are not required when the building is not required by code to have seismic restraints for MEP equipment.

45. *Specification 230700 HVAC Insulation Section 3.3H: "Provide an additional one hundred-fifty feet of preformed insulation and one hundred Fifty square feet of blanket and board type insulation as well as accessories and labor for each size, thickness and type used on the project to accommodate any changes required to resolve interferences or as directed by the Engineer". We assume this is not applicable. If it is, it is impossible to price up. Please advise exactly what will be required including accessories or provide an allowance in the bid form to cover this.*

    Response: Contractor shall include installation of additional materials in their bid.

46. *Specification 231123 Facility Natural Gas Piping: Delegated Design: 1.4C "Design restraints and anchors for natural-gas piping and equipment, including comprehensive*

engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated" and 1.5C "Delegated-Design Submittal: For natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation." Plumbing work will be done in accordance with local codes. Will this truly be required?

Response: Signed and sealed engineering analysis is required where performance requirements and design criteria for supports are specifically indicated. Hangers and supports shall be provided in accordance with applicable codes and standards and the manufacturer's recommendations.

47. *Specification 231123 Facility Natural Gas Piping: 3.4M "Provide an additional thirty feet of gas piping and accessories and installation labor for each size of pipe used on the project to accommodate any changes required to resolve interferences or as directed by the engineer." We assume this is not applicable. If it is, it is impossible to price up. Please advise exactly what will be required including accessories or provide an allowance in the bid form to cover this.*

Response: Contractor shall include costs of installation of additional materials in their bid.

48. *Specification 233113 Metal Ducts: 1.4C "Design Calculations: Calculations, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation for selecting hangers and supports and seismic restraints" HVAC work will be done in accordance with local codes. Will this truly be required? Also Mechanical and Electrical Seismic components are exempt per IBC and ASCE due to being a non-essential facility, risk category III. Please review and amend the seismic requirements.*

Response: Vibration and seismic restraint are not required when the building is not required by code to have seismic restraints for MEP equipment.

49. *Specification 233113 Metal Ducts 3.1G "Provide an extra 100 lbs of ductwork to accommodate ductwork revisions required to resolve interferences or as directed by the Engineer". We assume this is not applicable. If it is, it is impossible to price up. Please advise exactly what will be required (number of pieces, bends, straight pieces, reducers, etc.) or provide an allowance in the bid form to cover this.*

Response: Contractor shall include costs of installation of additional materials in their bid.

50. *Specification 233423 Section 3.1D: "Provide one additional exhaust fan similar to EF-2 as scheduled on the drawings to be used as directed by the Engineer." Is this truly required?*

Response: Additional exhaust fan is not required.

51. *Specification 233713 Section 3.2C: "Provide an additional five diffusers/registers of each type and size used on the project to accommodate ductwork revisions required to resolve interferences or as directed by the Engineer". Is this truly required?*

Response: Additional diffusers are not required.

52. *There is a fire protection general note section on Drawing M-1.0. Please confirm this is not applicable to this project.*

Response: Requirements for Fire Sprinkler protection are not applicable to this project.

53. *What the size and pressure of the existing water main in Frosthoffer Avenue is at the proposed 12" wet tap?*

Response: The water main on Frosthoffer Avenue is 12" ductile iron pipe. Pressure varies from 50 psi to 100 psi.

54. *The electrical site drawing ES-2.1 references a communications feeder conduit ductbank X-X. No detail for this ductbank is shown on the electrical drawings. Please advise the conduit size and quantity or provide a detail for this ductbank.*

Response: Details of the duct bank are shown on sheet E-6.2 Electrical Details.

55. *In addition to the American Iron and Steel Act being applicable to this project, is this project subject to the Build American Buy American Act of 2021?*

Response: Yes this project is subject to Build American Buy American Act. Please see Appendix J in General Conditions.

56. *In reference to Drawing ES-2.1, duct bank section B shows conduits feeding the high service pump building from the temporary 1200A service entrance equipment. This is in contradiction to the single line which shows the load being fed from new panel MDS via duct bank D, E, F and H. Please confirm these conduits in duct B are not required.*

Response: Please make Conduit Schedule item 4 to Spare with nylon pull cord.

57. *Please provide a detail for Cross-Section X-X that is shown on Drawing ES-2.1.*

Response: Please see attached Sketch ESK-1 Ductbank Detail X-X that shows (2) 4" Schedule 40 PVC conduits with long radius elbows for Fiber Optic cable.

58. *In reference to Drawing ES-2.1 duct bank section C shows conduits feeding the existing electrical building from the temporary 1200A service entrance equipment. This is in contradiction to the single line which shows this load being fed from new panel MDS via*

duct banks D,E,F and G. Please confirm these conduits in duct C are not required.

Response: The conduits shall be provided for the temporary feed and will be operational during construction. The conduits that feed the new building are separate and not the same or contradicting.

59. *Please confirm if the stairs for access to the lime tank as shown on Drawing S-5.3 are to be aluminum or steel.*

Response: Stairs are to be constructed from steel that is finished with hot dip galvanized coating.

60. *The 42" high handrail at the transformer enclosure as shown on Drawing D-3Section A, is the handrail to be made out of Aluminum? What diameter is the rail to be 1-1/2" Sch. 40 (O.D. 1.90")? Also, how will the handrail be attached to the top of the wall?*

Response: Railing shall be aluminum construction with a 1.5" diameter aluminum pipe. See Detail 2/S-5.3 for typical construction

61. *Are the existing utility lines that are being abandoned to just be cut and capped or will the lines have to be filled with grout?*

Response: The lines that are being abandoned will have to be cut and capped.

62. *Who will be removing the existing OH Utility poles?*

Response: Utility Company, The contractor is required to coordinate and provide all necessary resources with the local utility (PSE&G) to assist in the removal of the utility poles.

63. *Will the existing plant be offline during construction?*

Response: it is the intent of the specification to have the existing plant remain in operation as long as possible during construction.

64. *Please confirm if the Trojan UV units are to be furnished by the contractor or if they will be supplied by the owner and the contractor just performs the installation.*

Response: The Trojan UV units are to be furnished and installed by the Contractor. The GAC units however, are existing and to be relocated by the Contractor following media removal.

65. *For the installation of the new fire hydrant off the 14" watermain within the Frosthoffer ROW, is it possible to complete the installation using a wet tap? Note #9 on Drawing C-5*

references line stops.

Response: Yes, installation to be complete using a wet tap. No line stop required.

66. *Scope of Work Page 10 Section 1.10, Paragraph B, the pumps for the Klenphos and Sodium Hypochlorite confirming that the pumps are being purchased for the new building only and the term replacing the existing pumps does not refer to purchasing pumps for the old building as well, correct?*

Response: Yes that is correct. New pumps for Klenphos and Sodium Hypochlorite to be supplied and installed for the new building only.

67. *Pertaining to the Peristaltic Metering Pumps in Specification Section 463344, under Part 2 – Products, Section 2.2 Part C – Capacity, please provide information on the following: Discharge Capacity, Discharge Pressure and Process Fluid Viscosity.*

Response: The only chemical feed pump that is peristaltic type is the hydrogen peroxide pump.

1. Hydrogen Peroxide
    a. Peristaltic Metering Pump – WatsonMarlow-QDOS60 approved equal
    b. Discharge Capacity: 7.93 gph.
    c. Discharge Pressure: 100 psig max.
    d. Process Fluid Viscosity at 20 °C: 1.18 mPa*s.

All other chemical feed pumps are diaphragm type metering pumps as specified. Additionally, Section 463344 – 'Peristaltic Metering Pumps" has been revised and attached herein.

68. *Please confirm if the intent of this project is to just construct the proposed driveway extensions and then overlay the entire driveway area as shown on Drawing C-3 or was the intention to remove all of the existing asphalt and construct a new driveway. The hatching on Drawing C-3 shows everything being in dark gray and then on Drawing C-4, the proposal grading runs over the entire driveway area so wasn't sure if this could represent a larger than 2" fill over the existing or design was based on full reconstruction.*

Response: Pavement of the new driveway is required. The removal of the existing asphalt shall be completed as part of the site demolition and the cost shall be included in the same line item. Asphalt shall be removed as needed to achieve the new grading.

69. *Can information be provided on the dosing system for the Hydrogen Peroxide system? There does not seem to be anything in the specifications for this system.*

Response: The dosing skid will be supplied as part of the Trojan UV system. The dosing system shall be housed in a 60"x36"x25" stainless steel enclosure (Model No. SCE-603624FS). The enclosure shall include two (2) Peristaltic Metering Pump – Watson-Marlon

QDOS60 or approved equal, with two (2) pump mount large prom, one (1) calibration cylinder 1000ml ¾ FNPT (Model No. 7302236), one (1) gauge pressure digi transmit n4x (Model No. 3404), one (1) flowmeter (Model No. 5H1B02), one (1) vent, breather enclosure (Model No. M40X1.5 ABS), one (1) 12"wide electrical enclosure (Model No. SCE-1212CHNF) and all connecting piping. A cut sheet of the dosing skid is included as an appendix to this Addendum.

70. *Confirming all the piping that runs between the GAC pressure vessel units is part of the system being supplied by the owner along with all of the valve rack assemblies and the only piping being supplied by the contractor will be everything coming off the valve rack to the below grade runs?*

Response: All GAC vessel assembly piping between the vessels shall be reinstalled at the new location as shown on the plans.

71. *Contract Drawing S-1.0 references Precast Hollow Core Slabs. Based on review of the drawings did not see where these are applicable, please confirm.*

Response: Precast hollow core slabs are not applicable.

72. *Based upon a site visit 2025 with Rich Spafford of MPWC, while looking over the contract drawings he had some concerns that the connection of the new 8" backwash supply piping at the existing Filter Building was on the wrong side of the existing pump and it was possible a new pump might be required to be installed. Please confirm.*

Response: Please refer to the revised sheet C-5 and PP-2 for the revised layout of the 8" backwash supply piping

73. *Do you have Specs for the flow control valve?*

Response: Section 400567 "Flow Control Valves" has been added to the technical specification and attached herein.

74. *Will an office trailer need to be provided for the Owner or engineer as part of this project?*

Response: Office trailer is not required; however it is recommended.

75. *Will the owner be handling all of the concrete testing and soil compaction testing on the project?*

Response: Contractor will be responsible for all concrete testing and soil compacting testing. Any other specialty testing shall be paid under the Allowance if and where directed.

76. *Drawing PP-2 doesn't match Drawing P-3.1 for the water tie-in point. Can you please confirm which one is correct? Or are these two different things? If it is two different things, where does the "to building plumbing system" on PP-2 tie in?*

Response: The water tie-in point on Drawing P-3.1 is the correct one. Sheet PP-2 has been revised and attached herein.

77. *We ask you to consolidate the number of lump sum bid items in the bid form. Ideally, we would like to see one lump sum item and the other unit price items as needed. This eliminates the possibility of bidder error on the bid form. The bid form does not help in any way with the schedule of values produced to make the application for payment.*

Response: RVE understands the Contractor's challenge however unfortunately the lumps sum items will not be replaced with other unit price items for this project.

78. *The bid form has a Certification for American Iron and Steel Requirements of P.L. 112.76 but does not have a BABA form. BABA is more stringent in their requirements. Is this an AIS job or a BABA job? Please clarify.*

Response: This project is subject to the Build America Buy America (BABA) requirements (Please refer to Appendix J of the General Conditions). Additionally, Certification for American Iron and Steel (AIS) as per page P-22 of the Bid form shall be included for this project.

79. *Please provide existing details of concrete foundation, the concrete retaining wall and concrete pad no. 2, which are all to be demolished.*

Response: Existing details for the concrete foundation, concrete retaining wall and concrete pad no. 2 are not available.

80. *SCOPE calls for a 36" x 12" eccentric reducer but sheet C-6 calls out a 36" x 12" reducer. As an AIS/BABA 36" x 12" eccentric reducer is not made, we are assuming a concentric reducer will be acceptable, unless clarified by an addendum.*

Response: A concentric reducer will be acceptable.

81. *Please provide the existing invert elevation (for bidding purposes) of the sewer pipe where it crosses the chlorine contact pipe.*

Response: The sewer pipe does not cross the chlorine contact pipe.

82. *Please provide unit prices or identify the locations where they occur, for offsets for the water mains to avoid potential conflicts with existing piping.*

Response: The offset location is identified on Sheets C-5 and C-6 attached herein. Additionally, sheet D-3, also attached herein, has been revised to include a water main offset detail.

83. *Highway/Curb/Sidewalk/Road Opening/Construction Permits. Please provide an allowance line item in the bid form for these costs, or as required by law, these costs are to be identified, quantified and listed in the bid documents.*

Response: Any construction or related permit fees will be reimbursable under the allowance line item in the bid form.

84. *Keynote #13 on drawings M2.1 & M2.2 indicates that ductwork serving chemical room(s) is to be stainless steel. It looks like several rooms may be for chemical storage, but only the Sodium Hypochlorite Room has keynoted ductwork. We will assume this is the only room that requires stainless steel ductwork unless further clarified by addenda.*

Response: All ductwork in chemical rooms to be stainless steel.

85. *Sheet C-6 – Please clarify Note 9. What 14" x 6" reducing fitting are you looking for? A concentric reducer? A reducing tee? A reducing 90° elbow? Are we performing a wet tap or do you desire a line stop? What is the diameter, material and line pressure the existing pipe we are connecting to?*

Response: The existing pipe is 14" ductile iron pipe, pressure varies from 50psi to 100psi. Contractor shall perform a wet tap and install a 14" x 6" concentric reducer as shown on the revised Sheets C-5 and C-6 attached herein.

86. *Sheet C-6 please clarify the corp. stop items. Is this a corp stop or a 12"x 6" tee with a 6" gate valve?*

Response: The item closer to the gas pipe is a corp. stop. However, the connection with the 6" water line is to be performed with a 12"x6" tee with a 6" gate valve. Please see the revised sheet C-6 attached herein.

87. *SPECS - Polyethylene Pipe Encasement for DIP- as nothing is shown on the drawings, we assume it is not required, unless clarified by an addendum.*

Response: Polyethylene Pipe Encasement for DIP is not required.

88. *SPECS - Pipe testing- it is assumed that all testing will be 150 psi or less.*

Response: Testing shall be no less than 150psi as per the table in 3.4 B. of Section 400519 "Ductile Iron Process Pipe, Fitting and Specials".

89. *We have been informed by our sales rep that Quazite does not offer a 36"Wx36"Lx24"D polymer concrete handhole. Please advise what standard size quazite should be provided in lieu of this size (24"Wx36"Lx26"D or 36"Wx36"Lx36"D).*

Response: Please provide 36"Wx 36"L x 36"D handhole.

90. *We have been informed by our sales rep that Quazite does not offer a polymer concrete handhole. Please advise if a 36"Wx36"Lx36"D handhole should be provided instead.*

Response: Please provide 36"Wx 36"L x 36"D handhole.

91. *We have been informed by our sales rep that Quazite does not offer a 15"x17"x24"D polymer concrete handhole. Please advise if a what size handhole should be provided instead.*

Response: Please provide 17"W x 30"L x 24"D handhole.

92. *The floor plan on drawing E-2.0, and the single line diagram on drawing E-5.1, indicate a new 800A ECB to be furnished ahead of the existing 800A MCB in the existing electrical building switchboard. In an effort to reduce project costs, please advise if it would be acceptable to refeed the existing MCB in the electrical building swtichboard directly from the branch breaker in new switchboard MDS and eliminate the additional 800A ECB in the electrical room.*

Response: Please provide the new 800 Amp MCB to avoid any issues or disruption of electrical service to the plant.

93. *The 1200A main service disconnect is drawn as a fused disconnect on drawing E-5.1 but is listed as "1200A Main Breaker (LSIG) 35 KAIC". Drawing E-6.1 refers to it as "Main Switch 1200A/3P Fusible". Detail 1 on drawing E-6.10 appears to show a combination main switch & CT/Metering cabinet. Please clarify what is to be provided for the service main.*

Response: The 1200A main service disconnect is shown on Drawing E-5.1 as a Enclosed Main Breaker. Provide as detailed and specified.

94. *Drawing ES-2.1 calls out "Temporary 1200A/3P Service Entrance Disconnect, C.T. Cabinet & Metering on Unistrut Rack…". The Nema 3R enslosure rating for these devices conflicts with the Nema 4X enclosure rating shown for these devices on drawing E-5.1. Pease advise which enclosure rating is required.*

Response: Please provide NEMA 4X.

95. *In reference to the above RFI, please advise why the service equipment is listed as "temporary" on site plan ES-2.1.*

Response: The service entrance note listing the equipment rack as Temporary on Drawing ES-2.1 is because the service entrance equipment rack MUST be constructed to address temporary power for the entire project site to maintain plant operations during construction.

96. *Regarding the 800A ECB located ahead of the new ATS: Please advise if this breaker is to be 35 KAIC rated (shown as 35,000 KAIC).*

Response: The minimum 35 KAIC rating is required per PSE&G. The ATS minimum available rating is 42 KAIC per the manufacturer.

97. *The single line diagram on drawing E-5.1 shows a main service entrance disconnect with service grounding ahead of the new ATS. Specification section 263600 - Transfer Switches, Part 1.02 - Aceeptable Manufacturers states "Service entrance automatic transfer switch shall be ASCO Series 3AUS." Please advise if the Service Entrance requirement is applicable.*

Response: Provided the 1200 Amp LSIG enclosed breaker is installed ahead of and adjaent to the ATS. The service entrance rating is not required. If the Enclosed Main Breaker is not provided the sevice entrance rating will be required.

98. *Drawing E-3.5 shows the high service pump disconnect sswitches to be fused at 200A, however; drawing E5.1 shows the pumps to be fed from 175A trip breakers. Please advise if the fuses should be 175A or 200A as shown.*

Response: Please provide as specified.

99. *Ductbank detail B-B on drawing E-6.2 shows conduit and wiring to the high service pump building (conduit tags 4 & 5). We believe these are not required in detail B-B as this ductbank extends from the service rack to the first handhole. Please advise.*

Response: Please see ESK-1 sketch.

100. *Ductbank detail C-C on drawing E-6.2 shows conduit and wiring to the existing electrical building (conduit tags 4 & 5). We believe these are not required in detail C-C. Please advise.*

Response: Ductbank detail C-C indicates 4 as a spare and 5 does not exist.

101. *Please advise if a load center is required to be furnished with the generator. We did not see the requirement listed in specification section 263213. Ductbank details D-D & E-E include a 2" conduit w/ (4) #1 & (1) #6G for generator auxillary power. Additionally, please identify which panel auxillary power for the generator will be fed from.*

Response: Specification Section 263213-2.7 paragraph E indicates to provide a single phase house panel with MCB. Connect to new Panel LP with a 100Amp / 2 pole banch breaker.

102. *Please advise what control wiring is required for the new generator set. Control wiring for the generator is not currently shown on the one-line diagram. Additionally, please add the additional required conduits for control wiring to ductbank details D-D and E-E on drawing E-6.2.*

Response: Please provide (10) 16AWG stranded copper XHHW conductors in pipe #7 in ductbank detail D-D and pipe #6 in ductbank detail E-E from the generator to the ATS for control wiring.

103. *The single line diagram indicates conduit & wire tag 28C (4 sets of (4) #350 MCM + (1)#3/0G in 3" conduit). Ductbank details D-D & E-E indicate 3 sets of (4) #500 MCM + (1) 1/0G in 3-1/2" conduit. Additionally, the 500kW diesel generator is only rated for 750A at 480V, which would require just 2 sets of (4) #500MCM + 1/0G in 3-1/2" conduit. Please advise if the 750A feeder to the emergency generator would be acceptable. If not, please advise which of the other two options shown is required.*

Response: Please provide 28C as indicated on the single line diagram. Use one of the spare 3 1/2" conduits to house the 4th parallel feed.

104. *Ductbank detail K-K indicates a 2" conduit for "solar control wiring". Are we to assume the solar contorl wiring is by others and provide a pull string in this conduit? If not, please advise on the requirements for the solar control wiring.*

Response: The contractor shall provide all required control wiring to maintain the existing solar farm. It shall be the responsibilityof the contractor to coordinate with the existing solar system service company on the installation requirements of all control wiring required for a complete installation.

105. *Ductbank detail K-K indicates 2 sets of (4) #720 KCMIL + (1) #1/0G; however, the solar disconnect switch is rated for 400A amps. Please advise if (2) sets of feeders is required or if (1) set plus one spare conduit with pull string is acceptable. Additionally, please advise if the #720 KCMIL should be #750 KCMIL.*

Response: Please provide (2) sets of (4) 750 KCMIL XHHW and (1) 1/0AWG ground.

106. *Please advise if 120V power is required for the following instruments shown on drawing E-3.1: (2) motor actuate valves on the UV influent pipes, (2) flow meters on the UV influent pipes, (1) flow meter on the backwash supply pipe, (1) flow meter on the GAC effluent pipe. If so, please add to the corresponding electrical panel schedule.*

Response: 120V power is required, control conduits to be provided for each of the above-mentioned equipment as shown on the drawings. Please see revised Section 400566 “Valves and Piping Appurtenances” Subsection 2.2.

107. *Please advise if there are any flow meter requirements on the GAC influent piping. If so, please add to the corresponding electrical panel schedule.*

Response: A flow meter is not required on the GAC influent piping.

108. *Please advise if the fire alarm system will be a stand alone system or if we are required to integrate it with the existing systems in existing buildings. If existing system integration is required, please advise who the existing fire alarm system vendor is. Additionally, if wiring is required between the new FACP and the existing system, please show these wiring requirements in the plans.*

Response: No other structures on the site have a Fire Alarm System. The new Fire Alarm system is a stand alone system with expansion capability to add the other buildings in the future. The remote annunciator shall be located next to the double entry doors adjacent to the Chemical Room, northwest side of the new building.

109. *Please advise if we need interconnect wiring between the new SCADA RTU and an existing SCADA RTU in an existing building. If so, please indicate the existing building we are required to connect to and what the wiring requirements will be.*

Response: The existing SCADA RTU is located in the Main Filter Building (existing) Control Room, Old Filter Building (existing) Control Room and Electric Building (existing).Connect all with minimum 12 strand single mode Fiber Optic cable (OFCP) provide in ductbank X-X.

110. *Please advise on the intent of paragraph P in the MEP Scope of Work section on page 7: "Contractor shall provide a sub-fed service from the existing MCC to the new building…".*

Response: Paragraph P has been removed in its entirety.

111. *SECTION 400567.13 Calls out a Watts Series LF909 Reduced Pressure Zone backflow preventer. It further states the size is 12". We were just made aware that the LF909 only goes to 3". The drawings call for an 8" backflow preventor. Please provide the correct backflow preventer required for this job.*

Response: Please proceed with size 8" backflow preventor as shown on Sheet PP-2. Watts Series LF909 Reduced Pressure Zone flanged backflow preventer (basis of design) or approved equal. A cut sheet is attached herein.

112. *Please provide the size, material, etc. of the chemical feed piping for each system.*

Response: H2O2 Chemical feed lines to be ½" stainless steel. All other chemical feed lines to be ½" PVC.

THIS ADDENDUM MUST BE RETURNED WITH ALL BIDS

I acknowledge receipt of this Addendum:

_____
(Signature)

REVISED SPECIFICATION SECTIONS

SECTION 400566 – VALVES AND PIPING APPURTENANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide gate valves as shown on the drawings and specified herein.

B. Provide check valves as shown on the drawings and specified herein.

C. Provide Flow control valves as shown on the drawings and specified herein

D. Provide ball valves as shown on the drawings and specified herein.

E. Install butterfly valve as shown on the drawings and specified herein

F. Provide wet tap assembly as shown on the drawings and specified herein.

G. Related Requirements:

A. Section 400551 "Common Requirements for Process Valves" for basic materials and methods related to valves commonly used for process systems.

B. Section 466112 “Granular Activated Carbon Vessels”

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Perform Work according to:

A. The State of New Jersey (NJ) Department of Transportation standards.
B. The Municipality of Merchantville-Pennsauken Department of Public Works standards.

2.2 MATERIALS

A. Buried Gate Valves

A. Shall be mechanical joint, resilient wedge iron body gate valves, AWWA, non-rising stem, open right, 2"-12" 200 psi, 14" up to 150 psi working pressure with cast iron telescopic valve boxes with cover marked "Direction of Opening". Gate valves above grade (not buried) shall be mechanical joint, resilient wedge iron body gate valves, AWWA, non-rising stem, open left, 2"-12" 200 psi, 14" up to 150 psi working pressure. Gate valves and valve boxes shall be as manufactured by Mueller Company or equal and shall conform with standards of water department of the Owner.

B. Check Valves

A. Full flow type swing check valves shall have cast iron body with flanged ends rated at 125 lbs. Valves shall be fitted with an external lever and spring mounted on the wall side of each valve. Bronze body ring shall be threaded into the valve port. Valve clapper shall be cast iron, bronze face, and shall swing completely clear of waterway when valve is full open. Hinge pin shall be of 18-8 stainless steel construction and shall be utilized with bronze bushings and O-ring seals. Valves shall be equipped with removable cover plate to permit entry or for complete removal of internal components without removing the valve from the line. Valve rating shall be 175 PSI water working pressure, 350 PSI hydrostatic test pressure. Acceptable Manufacturer: Mueller Co.; Swing type check valve or approved equal.

C. Flow Control Valves

A. The Rate of Flow Control Valve shall automatically throttle and limit flow to a preset maximum rate, regardless of changing line pressure, by sensing the differential across a sized orifice plate. Flow rate is adjustable by changing the pilot set point. When differential pressure across the orifice plate is less than the pilot set-point the rate of valve opens allowing flow to meet the pre-determined demand. If differential pressure across the orifice plate exceeds the pilot set point, the rate of flow valve closes, limiting the flow to a preset maximum.

B. The main valve shall be hydraulically operated, single diaphragm actuated, globe or angle pattern. The valve shall consist of three major components; the body with seat installed, the cover with bearing installed and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from line pressure. Packing glands, stuffing boxes and/or rolling diaphragm technology will not be permitted and there shall be no pistons operating the main valve or pilot controls. No fabrication or welding shall be used in the manufacturing process. Main valve shall comply with NSF/ANSI Standard 61 and certified lead free to NSF/ANSI 372 as a safe drinking water system component.

C. A direct factory representative shall be made available by the equipment supplier for start-up service, inspection and necessary adjustments.

D. The control valve shall be Cla-Val Model Number 40-01, or approved equal.

E. The Rate of Flow Control Valve shall be field calibrated and tested for a maximum backwash flow rate of 1,405 gallons per minute.

D. Ball Valves

A. The carbon fill and discharge valves are 4” diameter full port ball valves, 316 stainless steel construction with TFE seats and seals. A total of four (4) valves are installed, two (2) for carbon fill and two (2) for carbon discharge.

B. Utility valves for the compressed air supply will be bronze or brass or barstock brass body regular port ball valves.

C. The lime slurry chemical feed pump for feeding the lime slurry solution shall be provided with a multi-function discharge valve and a full bore stainless steel ball valves for GAC fill and Discharge.

E. Butterfly Valves

A. The process and utility piping; excluding GAC fill and discharge piping will be equipped with cast iron butterfly valves for flow control. Valves are included as standard in the system and single valves are available as Option. A total of ten (10) 8” diameter butterfly

valves will be instaslled to accommodate the process and backwash control functions. Two (2) valves are needed for backwash control, two (2) valves are needed for influent isolation, two (2) valves for effluent isolation, two (2) valve for staging of the vessels and two (2) valves for the vent function. Butterfly valves in the valve manifold shall be Pratt Model MKII or approved equal. All butterfly valves in the valve manifolds shall contain motorized actuators for automatic operation. Motorized actuators shall be EIM HQ series or approved equal.

F. Tapping sleaves and valves

A. Tapping sleeves and tapping crosses shall be mechanical joint type in accordance with the type of joint specified for water mains hereto before. Lead tipped gaskets shall be used for mechanical joints. Tapping sleeves and crosses shall have ASA 125 lb. outlet flanges. Tapping sleeves and crosses shall be as manufactured by Mueller or approved equal.

B. Tapping valves shall be of same construction as AWWA 175 lb. valves cast iron, Non-Rising Stem (NRS). Resilient wedge gate valves with inlet end 125 lb. Flange or attachments to tapping sleeves or cross end with outlet end mechanical joint with type of joint as specified hereto before for water main. Tapping sleeves shall be equipped with valve boxes as specified for valves and valve boxes hereto before. Unless otherwise directed by the Owner, the direction of opening shall be left. Tapping valves and valve boxes shall be as manufactured by Mueller or approved equal.

G. Filter function valves shall be electrically actuated and shall be provided by the filter equipment manufacturer. Valve size shall be as specified on the attached Equipment Schedule.

H. Valve: The valve shall be designed, manufactured and tested in accordance with AWWA standard ANSI/AWWA C504. Flange end connections shall be ANSI B16.1 for class 125, or Mechanical Joint C111/A21.11 as noted on the drawings. Valve body shall be class 150B cast iron or ductile iron. Disc shall be ductile iron with resilient seat edge. Shaft shall be Type 304 S.S. Body seat ring shall be 304 S.S. Resilient seats shall be field replaceable, located on the valve disc edge and provide a 360-degree continuous, uninterrupted seating surface; valves utilizing glued body seats are not acceptable. Valve shall be Val-Matic Series 2000 or equal. No wafer valves will be accepted.

I. Electric Operator: The actuator shall consist of an electric motor, mechanical gear reduction, absolute position encoder with redundancy, electronic torque sensor, solid state motor controller, electronic control, protection and monitoring package, manual handwheel override and 32-character LCD and local control switches all contained in an enclosure that is sealed to NEMA 4, 4X, 6, IP68. Motor shall be an advanced brushless DC motor designed to energize on either 110VAC single phase. Valve position shall be sensed by an absolute position encoder. Open and close position shall be stored in permanent nonvolatile memory. The encoder shall measure valve position at all times with or without power or the use of batteries. The operator shall be provided with four (4) latched programmable status contacts. Remote control shall be configured as two, three or four wire control for open-stop-close command and be powered by an external 24 VDC to 120VAC power source or by the internal supply of 24VDC. LCD display shall provide valve position and operator status. Electric operator shall be Limitorque QX Series or equal. The supplier of the valve and operator shall be the authorized agent for both the valve and actuator manufacturer, take complete system responsibility and provide a 2-year warranty. Two (2) days startup and one (1) day operator training shall be provided.

J. Where manual actuators are specified in the Equipment Schedule, they shall be handwheel type gear with cast iron housing and handwheel and position indicator.

K. Electrically actuated valves shall be powered by the filter control panel.

2.3 SOURCE QUALITY CONTROL

A. As specified in Section 400551 "Common Requirements for Process Valves."

B. Testing: Test ball valves, gate valves, butterfly valves, check valves according to AWWA C507, AWWA C509, AWWA C504, AWWA C518.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that piping system is ready for valve installation.

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

3.2 INSTALLATION OF VALVES

A. Install valves, actuators, extensions, valve boxes, and accessories according to manufacturer instructions.
B. Firmly support valves to avoid undue stresses on piping.
C. Coat studs, bolts and nuts with anti-seizing lubricant.
D. Clean field welds of slag and splatter to provide a smooth surface.
E. Install valves with stems upright or horizontal, not inverted.
F. Install brass male adapters on each side of valves in copper-piped system and solder adapters to pipe.
G. Install valves with clearance for installation of insulation and to allow access.
H. Provide access where valves and fittings are not accessible.
I. Comply with Division 40 "Process Interconnections" for piping materials applying to various system types.
J. Retain one of the two paragraphs below.
K. Install insulation as indicated on Drawings or in pipe schedule.
L. Gate valves:

1. Handling, installation, jointing and tests shall be as specified for Water Main. All valves shall have stuffing boxes tightened if required and valves open and closed to see that all working parts are in order. Valves shall be set on blocking to ensure position while pouring and to prevent strain on connecting pipe or joints. Valve boxes shall be set directly over valve in vertical position. Fill around valve box by tamping in 8" layers. Reset valve boxes before final grading if required and clean out valve box of all foreign material so as to provide ease of operation.

M. Tapping Valves & Sleeves

1. Excavation and backfill shall be as hereto before specified. Adequate space shall be provided for installation of sleeve and tapping valve with machine. All surfaces on old pipe must be thoroughly prepared. The trench must be kept dry. Contractor shall determine exact location of existing main and other utilities before laying pipe. Tapping sleeves and crosses shall be located free of all services and joints in existing main. The complete installation including tapping sleeves and valves shall be watertight under static pressure. Only experienced personnel shall be used on the work. Any damage to existing main shall be the responsibility of the Contractor. The complete installation shall be in accordance with recommendations and directions of the manufacturer of the tapping machine used. Prior to tapping main, the Contractor and Water Superintendent shall mutually agree as to when the work shall be performed. Plugs removed from existing mains shall be delivered to water plant. The existing main shall be adequately supported during operation. Should the "cutting in" be unsuccessful through the use of tapping sleeves and crosses, Contractor shall, at no cost to Owner, furnish and install each side of the point of connection , an inserted valve under pressure as manufactured by Mueller or approved equal and make a dry connection.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:

A. Test for proper alignment.
B. If specified by valve Section, field test equipment to demonstrate operation without undue noise, vibration, or overheating.
C. Engineer will witness field testing.
D. Prepare test and inspection reports.

PART 4 - QUANTITY AND PAYMENT

4.1 No Separate payment shall be made for Gate Valves, Check Valves, Butterfly Valves, Ball Valves, Flow Control Valves and Cut in Sleeves. Contractor shall include the cost for the valves and all items required for a complete installation in the lump sum bid prices “PROCESS PIPING, VALVES, FITTING AND APPURTENANCES, COMPLETE” as provided in the Bid Form.

END OF SECTION 400563

SECTION 463344 - PERISTALTIC METERING PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Peristaltic-type metering pumps.

B. Related Requirements:

1. Section 260583 "Wiring Connections" for execution requirements for electrical connections to pumps specified by this Section.
2. Section 460553 "Identification for Water and Wastewater Equipment" for nameplates for equipment specified in this Section.

1.2 COORDINATION

A. Coordinate Work of this Section with plant operations.

1.3 SEQUENCING

A. Sequence Work to prevent interference with plant operations.

1.4 SUBMITTALS

A. Product Data:

1. Peristaltic-type metering pumps.
2. Submit pump performance characteristics.
3. Submit electrical characteristics and connection requirements.
4. Submit manufacturer model number, dimensions, service sizes, and finishes.

B. Shop Drawings:

1. Submit detailed and certified dimensional Shop Drawings for materials and equipment, including wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.
2. Signed and sealed by the qualified professional engineer responsible for their preparation.

C. Manufacturer's Instructions:

1. Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.
2. Submit application, selection, and hookup configuration.
3. Submit hanging and support requirements and recommendations.

D. Field Quality-Control Reports: For peristaltic-type metering pumps and accessories.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations and final orientation of equipment and accessories.

B. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.

1.6 QUALITY ASSURANCE

A. Ensure that materials of construction on pump liquid end are compatible with chemicals listed in schedule.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept pumps on-Site in manufacturer's original packaging and inspect for damage.

B. Storage:

1. Store products in areas protected from weather, moisture, or possible damage.
2. Do not store products directly on ground.

C. Handle products to prevent damage to interior or exterior surfaces.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Perform Work according to:

1. The State of New Jersey Department of Transportation standards.
2. The Municipality of Merchantville-Pennsauken Water Commission standards.

2.2 PERISTALTIC-TYPE METERING PUMPS

A. Manufacturers:

1. EMD Millipore Corporation.
2. Omega Engineering, Inc.
3. ProMinent Fluid Controls, Inc.
4. Peabody (Supplied by Trojan)

B. Description: Self-priming peristaltic metering pump.

C. Capacity:
1. The only chemical feed pump that is peristaltic type is the hydrogen peroxide pump, all other chemical feed pumps are diaphragm type metering pumps as specified.
a. Peristaltic Metering Pump – WatsonMarlow-QDOS60 or approved equal
b. Discharge Capacity: 7.93 gph.
c. Discharge Pressure: 100 psig max.
d. Process Fluid Viscosity at 20 °C: 1.18 mPa*s.

D. Operation:

1. Electrical Characteristics: As specified in Section 260583 "Wiring Connections"

E. Controls:

1. Adjustable settings from digital keypad
2. Flow Direction: Toggle switches.

F. Materials:
1. As recommended by manufacturer for chemical and process fluid and dosing chemical.

2.3 ACCESSORIES

A. Tubing:

1. Material:
a. Silicone Rubber: Comply with MIL ZZ-R-765.
b. Tygon.
c. Norprene.

2. Size and Wall Thickness: As indicated on pipe schedule.
3. Pressure Rating: As indicated on Drawings and pipe schedule.

B. Cables: 2-foot pump connecting cable with plug and 10-foot signal input cable.

C. Calibration Column:

1. One graduated calibration column; materials of construction compatible with chemicals being used.
2. Size calibration column for two-minute run time at maximum capacity of largest pump.

PART 3 - EXECUTION

3.1 INSTALLATION OF PERISTALTIC METERING PUMPS

A. Mount pump shelf to wall with stainless-steel expansion bolts as indicated on Drawings.

B. Fasten pump to mounting shelf with stainless-steel bolts.

C. Install power and control and wiring as specified in Section 260583 "Wiring Connections"

D. Flush tubing with clean water.

3.2 FIELD QUALITY CONTROL

A. Pre-operational Check: Before operating system or components, vent air from system to ensure water in pump.

B. Startup and Performance Testing:

1. Test metering pump flow rate by measuring time to fill or by draining calibration column with potable water.
2. Operate each chemical feed system on clear water for continuous period of four hours.
3. Hydrostatically test system piping for leaks at 150 psig.

3.3 DEMONSTRATION

A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

B. Demonstrate system control functions and alarms.

C. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than one day on-Site for installation, inspection, field testing, and instructing Owner's personnel in maintenance of equipment.

D. Equipment Acceptance:

1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
2. Make final adjustments to equipment under direction of manufacturer's representative.

E. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

PART 4 - QUANTITY AND PAYMENT

4.1 Payment for all materials associated with the Peristaltic Metering pump in accordance with the drawings or as directed by the Engineer shall be on a lump sum basis for the item “CHEMICAL TANKS AND FEED SYSTEMS INCLUDING INSTALLATIONS, COMPLETE” as indicated in the Bid Form. Peristaltic Metering Pump Installation

END OF SECTION 463344

SECTION 466616 - CLOSED-VESSEL LOW-PRESSURE/HIGH-INTENSITY ULTRAVIOLET TREATMENT EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Closed-vessel, low-pressure, high-intensity ultraviolet treatment equipment. The Contractor shall furnish and install ultraviolet disinfection equipment, and all appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents. Two (2) Low Pressure UV reactors to be provided each capable of treating a flow of 1,000 gallons per minute (1.44 MGD).

B. Related Requirements:

1. Section 260583 "Wiring Connections" for execution and product requirements for connecting equipment specified by this Section.
2. Section 460553 "Identification for Water and Wastewater Equipment" for nameplates for equipment specified in this Section.

1.2 COORDINATION

A. Coordinate Work of this Section with Work of other Sections.

B. Maintain flow of water and its disinfection until proposed system is tested, approved, and fully operational.

1.3 SUBMITTALS

A. Submit for review, engineering drawings showing the following:
1. Complete description in sufficient detail to permit comparison with the specifications.
2. Dimensions and installation requirements.
3. Descriptive information including catalogue cuts and manufacturer’s specifications for all major components.
4. Electrical schematics and layouts.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of installed UV treatment equipment and accessories.

1.5 QUALITY ASSURANCE

1.6 A. The manufacturer shall validate to New Jersey N.J.A.C. 7:10 Safe Drinking Water Act Rules pertaining to UV disinfection.

1.7 DESIGN REQUIREMENTS

A. Effluent Criteria
1. Average Wet Weather Flow: 2.88 MGD
2. Peak Design Flow: NA
3. Acceptable Turbidity Range: 1 NTU
4. Annual Effluent Temperature Range: 34° F to 104° F
5. Design UVT: 96% at 254 nm adjusted to a 1cm path length.
6. 1,4 dioxane (influent concentration): based on water quality analysis the influent concentration of 1,4 Dioxane ranges from 1.48 µg/L (ppb) to 1.55 µg/L and at the POE ranges from 1.24 µg/L to 1.54 µg/L.
7. 1,4 dioxane (after treatment): less than 0.3 parts per billion (ppb).

B. Performance Criteria
1. The ultraviolet disinfection system shall produce an effluent with 1,4 Di-Oxane concentrations less than 0.3 ppb. Performance shall be verified through performance testing.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.9 WARRANTY

A. Performance Warrantee

1. The UV system furnished under this section shall meet the performance criteria specified in this section. Performance testing will be conducted as specified in this section to determine that the supplied equipment meets the performance criteria.

2. The manufacturer shall provide a performance bond in the amount of the cost of the equipment. Performance bond will be released upon demonstration that equipment meets the performance criteria via performance testing protocol specified in this section.

B. Equipment Warrantee

1. The equipment furnished under this section shall be free of defects in materials and workmanship, including damages that may be incurred during shipping, storage, and installation for a period of two (2) years from date of equipment acceptance.

2. The UV lamps to be warranted for a minimum of 15,000 hours, on a prorated basis.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Perform Work according to:

1. The State of New Jersey Department of Transportation standards.
2. The Municipality of Merchantville-Pennsauken Department of Public Works standards.
3. Merchantville-Pennsauken Water Commission standards.

B. The objective of the performance test is to demonstrate that the equipment, as installed, achieves the design limits, as indicated in the Performance criteria. The duration of the test shall be ten (10) business days. Sampling may be done any time over a three (3) week period.

C. The Owner will perform initial performance testing outlined in this paragraph. Owner will also pay for costs associated with initial performance testing. If additional testing is required to determine whether equipment meets the performance requirements, the manufacturer shall perform and pay for additional tests.

D. Performance Test Procedure

E. One (1) set of samples shall be collected per day for ten (10) business days. A set of samples shall consist of a sample collected prior to treatment by the UV system, and a sample collected after treatment by the UV system. Ten (10) sets of samples shall be taken in a three-week period.

F. Sampling and Testing Procedures

1. Sample collection, preservation, and analysis shall be in accordance with section 9010, 9060 and 9060 B in Standard Methods for The Examination of Water and Wastewater, 19th edition.
2. Samples are to be taken as grab samples, samples taken at a specific time and location, as opposed to composite or blended samples taken over a given time period.

2.2 CLOSED-VESSEL, LOW-PRESSURE, HIGH-INTENSITY ULTRAVIOLET TREATMENT EQUIPMENT

A. Manufacturers:

1. Trojan Technologies (Series UV Flex) or approved equal.

2. Description: Closed-vessel, horizontally orientated UV disinfection system, consisting of following:

    a. UV lamp module with support rack and bracket.
    b. Instrumentation, controls, and power distribution.
    c. UV monitoring system.
    d. Elapsed time meter.
    e. Lamp cleaning system.

3. Provide a UV disinfection system complete with UV modules, control panel, and detection systems, as herein specified.

4. The system shall be designed to allow for complete system shut down or by-pass.

5. The system shall be able to continue providing disinfection while replacing UV lamps, quartz sleeves and ballasts, and while cleaning the sleeves.

6. System shall be configured as shown in the plans fit channel and specified in this section. Any modifications required by manufacturer to furnish and install this equipment shall be considered coincidental to the contract.

7. System design shall be based on the following:

    b. Performance shall be based on providing full redundancy at average wet weather flow.

8. Any deviations from system design basis proposed by supplier must be based on actual performance data provided by supplier.

9. The system shall be hydraulically controlled with manufacturer supplied finger weir.

B. Lamps:

1. Type:

    a. Mercury vapor.
    b. Design: Hot cathode, instant start.
    c. High intensity, low pressure amalgam.
    d. Operated by electronic or magnetic ballasts at multiple power settings.

2. Filament: Clamped design to withstand shock and vibration.

3. Module:

    a. Description: Lamps placed in individual fused-quartz sleeves, and sealed and supported in NEMA 6P stainless-steel frame.
    b. Wiring: Completely enclosed and protected from water.
    c. Base: Metal and ceramic. Resistant to UV and ozone.
    d. Replacement: Capability of replacing lamp without disassembling or removing sleeve.
    e. Furnish mechanical lifting device for individual lamp modules weighing over 55 lb.

4. Sleeves:

    a. Description: Single piece clear fuse quartz tubing. Close one end of each sleeve and seal opposite other end with lamp end seal and O-ring.
    b. Material: Clear Fused quartz
    c. Seal: Stainless-steel nut and O-ring seal.
    d. Configuration: Prevent lamp sleeve from touching steel components.

5. Ballasts:

    a. Comply with ANSI C82.4.
    b. Design: Modular, for quick disconnect and replacement.
    c. Conducted and Radiated Emission: Comply with 47 CFR 15.
    d. Power Output: 1 percent incremental steps from 30 to 100 percent of rated lamp power.

C. Performance and Design Criteria:

1. Flow Rate:
    a. Peak: 2.88 MGD.
2. Acceptable Turbidity Range: 1 NTU
3. Pressure Drop at Peak Flow: 0.1 in H_2O
4. Water Temperature Range: 34 to 104 degrees F.
5. System Pressure: 60 psi (standard), 90psi and 120 psi (optional)
6. Design UVT: 96% at 254 nm adjusted to a 1cm path length.1,4 Di-Oxane: less than 0.3 parts per billion (ppb).
7. Lamps:
    a. Number: 32 operating per chamber AND capable of future expansion to 64 lamps per chamber
    b. Type: Low pressure, high intensity.
    c. UV Transmittance at 254 nm: 96 percent (minimum).
    d. Minimum UV Output per Lamp: 500 W.
    e. Minimum Arc Length: 40 inches.

8. Maximum Ozone Production: Zero.

D. Materials:

1. Metal Components in Contact with Water: Type 304 stainless steel.
2. Components Exposed to UV Light: Quartz.

E. Operation:

1. Electrical Characteristics:
    a. Each bank shall be powered from a Power Distribution Center. Service entrance for power feed termination to be provided.
    b. Maximum total power consumption rating shall be no greater than 42 kW.
    c. Electrical supply to each Power Distribution Center shall be 480 volts, 3 phase, 5 wire.
    d. Electrical supply to the mechanical system center of each reactor shall be 120 V, 1 phase, 2 wire.

e. Electrical supply to the system control center shall be 120 V, 1 Phase, 2 wire plus gnd.
f. Signal wiring interfacing the UV system and the System Control Center (SCC), shall be as shown on the Engineering Drawings.

2. Control Panel:
   a. Enclosure material shall be type 304 Stainless steel.
   b. Each module sub-system shall be wired from the main power distribution blocks into an Earth Leakage Protection Device (ELPD).
   c. All internal components shall be sealed from the environment.
   d. All CPP's to be UL approved with a minimum rating of NEMA 12.
   e. All local fused disconnects or breakers to be supplied by others.

3. Controls:

   a. Description: Automatic flow-and water-quality-paced Allen-Bradley PLC which continuously monitors and controls the UV system's functions. The control system energizes and de-energizes lamps to maintain required UV dosage, and adjusts UV intensity in proportion to water flow rate.
   b. OIS: The operator interface shall be menu driven with automatic fault messages when alarm conditions are annunciated. Complete control and monitoring of the entire system is accomplished through this interface.
   c. Signals: 4 to 20 mA dc.
   d. Furnish programming to perform operations.
   e. Lamp Status Indicators: ON-OFF.

4. Lamp Monitoring System:

   a. Indicate location and operating status of each lamp.

   b. Annunciate remote alarm upon lamp failure.

   c. Alarm history register: gives a record of the 20 most recent alarm conditions, recorded by alarm type, date, and time of accurance.

   d. Alarms shall identify the affected lamps by an address system. The address shall specify the bank, module, and lamps.
   e.

5. UV Intensity Detection System:

   a. Description: Sense and display intensity in each bank of lamp modules between 254.5 and 255.0 nm.
   b. Furnish one UV intensity meter for each bank of lamp modules.
   c. Indicates safe intensity, low intensity, and unsafe intensity by means of color codes on meter face.
   d. Each back shall be capable of being placed in either On, Off or Remote mode.
   e. The UV module banks shall be cycled for equal wear and timed off to minimize bank cycling.

6. Elapsed Time Meter:

a. Description: One nonresettable elapsed time meter for each bank of lamp modules.
b. Operation: Zero to 99,999 hours.
c. Elapsed time of each bank shall be recorded and displayed on the display screen when prompted.

7. Switches: Furnish one HAND-OFF-AUTO switch for each UV bank.
8. Alarms shall be provided to indicate an extreme alarm condition in which the disinfection performance may be jeopardized. The alarms shall include:
   a. LOW UV INTENSITY : shall be preset at the factory for 25% of the intensity after 100 hours burn-in of the lamps. The alarm set point shall be field adjustable. Individual LAMP FAILURE: failed lamps shall be indicated by specific address (i.e. bank # / module # / lamp #).
   b. Two or more adjacent LAMPS FAILURE.
   c. Multiple LAMPS FAILURE.
   d. MODULE FAILURE.
   e. Low UV Dose: shall occur when the design dose is not being delivered.

9. Disconnect Switch: Factory mounted in control panel.

2.3 ACCESSORIES

A. UV Transmittance Analyzer: the UV system shall be equipped with an on-line transmittance measurement device, specifically designed for continuous monitoring of the effluent UV transmittance.

1. Description:

   a. Analyzer, sensor, and sampler, each with a separate NEMA 250 Type 4X enclosure.
   b. Continuously monitor percent UV transmittance of water.

2. Range: Zero to 100 percent transmittance.
3. Accuracy: Plus and minus 1 percent of full scale.
4. Operating Temperature Range: 20 to 120 degrees F.
5. Alarms: HIGH. LOW, and OFF.
6. Display: LCD, with a 60 minute graph.
7. Manufacturer: Trojan
8. Model: Optiview.

B. Dose-Pacing:
1. A dose-pacing system shall be supplied to turn the UV banks on and off in relationship to a 4-20 mA DC signal from an effluent flow monitor as well as a signal from a UVT monitor, which shall be supplied by the UV manufacturer, and individual UV intensity sensors.

2. The system to be dose-paced such that as the flow changes, the design dose delivered is optimized while conserving power.

3. The dose-pacing system shall allow the operator to vary the design dose setting. Logic and time delays shall be provided to regulate the UV bank ON/OFF cycle.

C. Cleaning System:

1. Description:

a. Automatic mechanical/chemical cleaning system, capable of cleaning lamps during disinfection and without removing lamps from unit.
b. Automatically wipe lamp sleeve surface while dowsing lamp sleeve surface with acidic solution.
c. The cleaning system shall be fully operational without requiring either lamps or modules be placed out of service.
d. The system shall be provided with the required cleaning reagents and solutions necessary for initial equipment testing, for equipment start-up, and for one (1) year of operation.

2. Cleaning Cycle: Field adjustable, from once each hour to once each month.
3. Manual Operation: Furnish operator interface.

D. Hydrogen Peroxide Tank and Dosing System

1. Furnish and install a 3,000-gallon nominal capacity dual contained HDLPE primary tank with UV inhibitor and dosing system. The tank shall be contained in a 4,000-gallon secondary tank. Manufacturer: Peabody (supplied by Trojan)

2.4 SOURCE QUALITY CONTROL

A. Provide shop inspection and testing of completed assembly.

B. Owner Inspection:

1. Make completed clarifier equipment available for inspection at manufacturer's factory prior to packaging for shipment.
2. Notify Owner at least seven (7) days before inspection is allowed.

C. Owner Witnessing:

1. Allow witnessing of factory inspections and test at manufacturer's test facility.
2. Notify Owner at least seven (7) days before inspections and tests are scheduled.

D. Certificate of Compliance: If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that facilities are ready to receive floating mechanical mixers.

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

3.2 INSTALLATION OF CLOSED-VESSEL, LOW-PRESSURE, HIGH-INTENSITY ULTRAVIOLET TREATMENT EQUIPMENT

A. According to manufacturer instructions.

3.3 FIELD QUALITY CONTROL

A. Inspection and Functional Testing:

1. Operate UV system for minimum seven consecutive days with plant water.
2. Test and Inspect:

    a. Proper installation and alignment of UV support racks and frames.
    b. Watertightness.
    c. Electrical wiring and connections.
    d. Instrumentation, alarms, and indicators.
    e. ON-OFF and HAND-OFF-AUTO switches and ground fault circuit interrupters.
    f. Lamp removal system.
    g. Lamp cleaning system.

B. Performance Testing:

1. After installed UV equipment has been inspected and functional test has been completed, begin performance testing.
2. Collect samples at or near peak flow rate.
3. Analyze samples for following parameters:

    a. Fecal coliform, MPN per 100 mL, immediately upstream of UV treatment equipment.
    b. Fecal coliform, MPN per 100 mL, immediately downstream of UV treatment equipment.
    c. TSS, immediately upstream of UV treatment equipment.
    d. Percent UV transmittance (UVT) at 254 nm, immediately upstream of UV treatment equipment.

4. Test for 2 continuous days, and collect and analyze samples three times in each 24-hour period.
5. If sample results do not meet specified performance, retest for minimum two additional consecutive days or until acceptable bacteriological results have been obtained.

3.4 DEMONSTRATION

A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

B. Manufacturer Services:

1. Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**Insert**> days on Site for installation, inspection, startup, field testing, and instructing Owner's personnel in maintenance of equipment.

C. Equipment Acceptance:

1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
2. Make final adjustments to equipment under direction of manufacturer's representative.

D. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

PART 4 – QUANTITY AND PAYMENT

4.1 Advanced Oxidation Process:

Payment for all materials and installation associated with the UV system in accordance with the drawings or as directed by the Engineer shall be on a lump sum basis for the item "ADVANCED OXIDATION PROCESS INCLUDING HYDROGEN PEROXIDE FEED SYSTEM AND UV DISINFECTION SYSTEM, COMPLETE" as indicated in the Bid Form. Include all material supplied by the UV vendor including costs for the vessels, valve manifolds, all labor and equipment costs for installation of vessels, valve manifolds, piping, Programmable Logic Controller, piping, and appurtenances delivered to the site as part of the UV system.

4.2 Electrical and Controls Work:

Payment for electrical and controls costs associated with the UV System Equipment for electrical connections, and communication wiring required for a complete project in accordance with the drawings or as directed by the Engineer shall be made on a lump sum basis for the item "INSTRUMENTATION AND CONTROL SYSTEMS" as indicated in the Bid Form.

4.3 SCADA:

Payment for electrical and controls costs associated with the UV System Equipment for connection to the existing control system required for a complete project in accordance with the drawings or as directed by the Engineer shall be made on a lump sum basis for the item "ALLOWANCE FOR SCADA INTEGRATION, COMPLETE" as indicated in the Bid Form.

END OF SECTION 466616

ADDITIONAL SPECIFICATION SECTIONS

SECTION 066000

PVC PANELING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plastic wall liner panels.
B. Plastic ceiling panels.

1.2 RELATED SECTIONS

A. Section 097700 (09 77 00) Special Wall Surfacing

1.3 REFERENCES

A. Canadian Food Inspection Agency (CFIA) Approval
B. ASTME 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
C. ASTM D4226- Standard Test Method for Impact Resistance
D. ASTM G21- Standard Test Method Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
E. City of Los Angeles Research Report: RR 26036

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods

C. Shop Drawings: Submit plan, section and elevation drawings to depict the actual construction of each unit type specified, and to depict proper attachment and installation techniques. Coordinate locations with those indicated on the contract drawings.

D. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Primary products shall be manufactured and supplied by a single manufacturer.
B. Installer Qualifications: Products shall be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
B. Store panels flat.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits. Panels should be installed at temperatures that are within 40F degrees of operating temperature
B. Cold Temperatures – Do NOT install panels at temperature at or below 32F degrees.

1.8 WARRANTY

A. At project closeout, provide to Owner or Owner's Representative an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage. 1. Term: Limited Lifetime.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Parent Manufacturer: MSW Plastics, Inc.
Located at: 140 Minto Road Palmerston, ON N0G2P0
Phone: (888) 418-4679 Fax: (866) 457-9859
B. Partner Manufacturer: US Polymers, Inc.
Located at: 1057 South Vail Avenue Montebello, CA 90640
Email: info@mswplastics.ca Website: www.mswplastics.ca
C. Substitutions: Equivalent product matching the material properties listed herein obtained from a single source.

2.2 PVC WALL PANELS

A. Product: TrusscoreTM PVC Interlocking Liner Panel, or equal

1. Description: Tongue-and-groove, rib-reinforced wall panels with nailing fins.
2. Material: PVC; 100 percent virgin
3. Outside Surface: Flat.
4. Width: 16 inches.
5. Thickness: 1/2 inch.
6. Weight: 0.8 pounds per square foot
7. Surface Burning Characteristics, ASTM E 84: Class A
    a. Flame Spread Index: 10
    b. Smoke Developed Index: 400
8. Color: White
9. Corrosion proof
10. Waterproof, Nonporous

2.3 PVC CEILING PANELS

A. Product: TrusscoreTM PVC Interlocking Liner Panel, or equal

1. Description: Tongue-and-groove, rib-reinforced wall panels with nailing
2. Material: PVC
3. Outside Surface: Flat.
4. Width: 16”
5. Thickness: 1/2 inch.
6. Weight: 0.8 pounds per square foot
7. Surface Burning Characteristics, ASTM E 84: Class A
    a. Flame Spread Index: 10.
    b. Smoke Developed Index: 400.
8. Color: White
9. Corrosion proof
10. Waterproof, Nonporous

2.3 ACCESSORIES

A. Product: TrusscoreTM PVC Trim, or equal

1. Description: J Trim, Outside Corner, Inside Cove, Base Trim, H Divider and F-Channel.
2. Material: PVC, 100 percent virgin
3. Color: White

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install wall and ceiling panels in accordance with manufacturer's instructions at locations indicated on the Drawings.
B. Install wall and ceiling panels plumb, level, square, flat, and in proper alignment.
C. Install trim in accordance with manufacturer's instructions.
D. Ceiling Panels: Anchor ceiling panels with fasteners in accordance with manufacturer's instructions.
E. Wall Panels: Anchor wall panels with construction adhesive and fasteners in accordance with manufacturer's instructions.
F. Fasteners:
    1. Fastening into Wood or Metal: Stainless Steel or Zinc coated, 1 inch, No. 10 pancake head screw.
    2. Fastening into Masonry: Stainless steel, Tapcon 3/16-inch x 1-1/4 inch screws.
    3. Install fasteners in pre-punched holes 16 inches to 24 inches on center into screw flange.
    4. Ensure screw flange lays flat against surface, between screw head and substrate, not deformed around screw heads.
    5. Do not recess screw heads into nailing fins.
    6. Ensure fasteners are not exposed.
    7. Staples: Do not use.
G. Cutting Panels:
    1. Field-cut panels as necessary in accordance with manufacturer's instructions.
    2. Ensure cuts are straight, square, and do not damage panels.

3.4 CLEANING AND ADJUSTMENT

A. Clean with a mild detergent or soap scum remover.
B. Where detergents do not work, low pressure washers with mild soap and a soft cloth may be used.
C. Multi-purpose cleaners may be used, provided they are PVC compatible. Spot test material in an inconspicuous location prior to cleaning.
D. Do not use of abrasive cleaners.
E. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
F. Where damage cannot be repaired, remove and replace damaged Work in accordance with manufacturer's instructions.

3.5 PROTECTION

A. Protect installed products until completion of project.

PART 4 - QUANTITY AND PAYMENT

4.1 No specific payment shall be made for work under this section and all costs for said work shall be incorporated in various items in the bid proposal associated with this work.

END OF SECTION 066000

SECTION 074113

METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and other Contract Documents, listed in the agreement between the Owner and Contractor, apply to this Section.

1.2 SUMMARY

A. Section includes exposed-fastener, metal roof panels.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.
2. Include similar Samples of trim and accessories involving color selection.

D. Qualification Data: For Installer.

E. Product Test Reports: For each product, for tests performed by a qualified testing agency.

F. Field quality-control reports.

G. Sample Warranties: For special warranties.

H. Maintenance Data: For metal panels to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of

similar size and complexity.

B. Panel Manufacturer: Minimum of 10 years experience in manufacturing architectural roof panels in a permanent stationary indoor facility. Provide facility information if requested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Store panels in accordance with manufacturer's recommendations.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.7 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Material and Workmanship Warranty: Manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Paint Finish Warranty from date of Substantial Completion.

1. **30 years for Kynar type finish.**

C. Installer's Warranty: Submit installer's warranty, signed by Installer, covering the Work of this Section, including all components of wall panels for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL ROOF AND WALL PANEL SYSTEMS

A. Basis of Design: **Hefti-Rib**, as manufactured by **Fabral Metal Wall and Roof Systems**

B. Substitutions: Approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. Refer to Manufacturer's product data for specific performance criteria.

1. UL90 Construction #294
2. ASTM B283 no air @ 20 PSI
3. ASTM B331 no water @20 PSI
4. 1HR / 2HR / 3HR firewall assemblies UL U646 / U642 / U643
5. ICC-ES ER-5468 Report
6. UL Class A Fire
7. UL 2218 Class 4 Hail
8. Factory curving available down to 10' radius
9. Perforating available
10. Mitered corners available

2.3 MANUFACTURER

A. Fabral Facilities:

Lancaster, PA 17601
Telephone: 800.477.2741
Website: www.fabral.com

B. Approved Equal

2.4 EXPOSED-FASTENER, METAL PANELS

Profile to match existing metal panel siding on site.

1. Galvalume Steel: AZ50 / AZ55Mar

a. Material Gauge:
   - 22 gauge Galvalume (ASTM A792), 50 ksi yeild strength
   - 0.040" Aluminum (ASTM B209)
b. Exterior Finish: Kynar (or equal)**,** baked on resin based PVDF finish
c. Color: As selected from manufacturer's full range.

2. Rib Spacing: 7.2 inches o.c.
3. Panel Coverage: 36 inches.
4. Panel Height: 1-1/2 inches.

2.5 MATERIALS

A. Metallic-Coated and Painted Steel Sheet aluminum-zinc alloy-coated steel sheet(Galvalume) complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

B. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

2.6 MISCELLANEOUS MATERIALS

A. Snow Guards:
   1. Basis of Design: snow guards as recommended by the approved roofing manufacturer
   2. Substitutions: Approved Equal
   3. Install per manufacturer's recommendations.
   4. Provide "screw and glue" attachment method, using Surebond Everseal **SB-190** (or Approved Equal) adhesive sealant and **stainless steel #10 self-tapping fasteners**.
   5. Minimum spacing between individual snow guards within a row shall be 2'-0"
   6. Minimum spacing between rows of snow guards shall be 10'-0"

B. Miscellaneous Metal Sub-framing and Furring: Provide manufacturer's standard sections as required for support and alignment of metal panel system.

C. Panel Accessories: Provide components required for a complete, weather-tight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

D. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

E. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

F. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.

   1. Sealant Tape
   2. Joint Sealant
   3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.7 FABRICATION

A. Provide panel profile, including major ribs for full length of panel.

B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual"

that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.8 FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. (STD 24-18 GA)

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weather-tight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib or as shown in manufacturers recommendations . Apply panels and associated items true to line for neat and weather-tight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture

of washer.

4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.
6. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

E. Accessory Installation: Install accessories with positive anchorage to building and weather-tight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

PART 4 - QUANTITY AND PAYMENT

4.1 No specific payment shall be made for work under this section and all costs for said work shall be incorporated in various items in the bid proposal associated with this work.

END OF SECTION 074113

SECTION 087000

FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and General provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications Sections apply to work of this section.

1.2 DESCRIPTION OF WORK:

A. Definition: "Finish Hardware" includes items known commercially as builders hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame. Types of items in this section may include (but are not necessarily limited to):

Hinges

Door stop
Lock cylinder and keys
Lock and latch set
Door Closers

Panic Bar

1.3 QUALITY ASSURANCE:

A. Manufacturer: Obtain each kind of hardware data (latch and lock sets, hinges, closers, etc.) from two manufacturers, although several may be indicated as offering products complying with requirements.

1.4 SUBMITTALS:

A. Submit in accordance with SUBMITTALS, Section 01300:

1. Product Data: Submit manufacturer's technical information for each item of hardware. Include whatever information may be necessary to show compliance with requirements, and include instruction for installation and for maintenance of operating parts and finish. Transmit copy of applicable data to Installer.

2. Hardware Schedule: Submit final hardware schedule in the manner and format specified, complying with the actual construction progress schedule requirements. Hardware Schedules are intended for coordination of work.

3. Final Hardware Schedule: Based on builders hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

a. Type, style, function, size and finish of each hardware item.

b. Name and manufacturer of each item.

c. Fastenings and other pertinent information.

d. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.

e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

f. Mounting locations for hardware.

g. Door and frame sizes and materials.

B. Submittal Sequence: Submit schedule at earliest possible data particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by builders hardware, and other information essential to the coordinated review of Hardware Schedule.

C. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of lock has been fulfilled.

D. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of builders hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.

E. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

1.5 PRODUCT HANDLING:

A. Packaging of hardware, on a set by set basis, is the responsibility of the supplier. As material is received by the hardware supplier from the various manufacturers, sort and repackage in containers marked with the hardware set number.

B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control the handling and installation of hardware items which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses, both before and after installation.

1.6 JOB CONDITIONS:

A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic

installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

B. Template: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions are made for the proper installation of hardware.

PART 2 – PRODUCTS

2.1 RESPONSIBILITIES OF BUILDERS HARDWARE SUPPLIER:

A. Submittals: Provide through Contractor required Products Data, Final Hardware Schedule, Separate Keying Scheduled (if required), and samples as specified in Part 1 – General of the Section, unless otherwise indicated.

B. Construction Schedule: Inform Contractor at earliest possible date of estimated times and dates to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing Builders Hardware for purposes of including in construction progress schedule and then comply with this schedule.

C. Products Handling: Package, identify, deliver, and inventory hardware as specified in Part 1 – General of this Section.

D. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of hardware selection: furnish proper types, finishes, and quantities of Builders hardware, including fasteners, and Owner's maintenance tools; and furnish or replace any items of Builders hardware resulting from shortages and incorrect items, at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

2.2 RESPONSIBILITIES OF CONTRACTOR:

A. Submittals: Coordinate and process submittals for Builders Hardware in same manner as submittals for other work.

B. Construction Schedule: Cooperate with Builders Hardware supplier in establishing scheduled dates for submittals and delivery of templates and builders hardware.

C. Coordination: Coordinate builders hardware with other work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and propriety of hardware with supplier.

D. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials. Any hardware items lost, damaged or stolen after being accepted by Contractor shall be replaced at Contractor's expense.

2.3 MATERIALS AND FABRICATION:

A. General:

1. Hand of door: The Drawings show the direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of the door movement as shown.

2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to the Engineer.

a. Manufacturer's identification will be permitted on rim of lock cylinders only.

3. Base Metals: Product hardware units of the basic metal and forming method indicated, using the manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for the applicable hardware units by FS FF-H-106, FS FF-G-111, FS-F-H-116 and FS FF-H-121. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

4. Fasteners: Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

5. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible, including prepared for paint in surfaces to receive painted finish.

6. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for installation where the bolt head or the nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work.

7. Tools for Maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance, and removal and replacement of builders hardware.

2.4 HINGES, BUTTS AND PIVOTS:

A. Templates: Provide only template produced units.

B. Screws: Furnish Phillips flat-head all-purpose or machine screws for installation of units. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins

2. Non-ferrous Hinges: Stainless steel pins.

3. Exterior Doors: Non-removable pins.

4. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.

5. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90” or less in height and one additional hinge for each 30” of additional height.

2.5 LOCK CYLINDERS AND KEYING:

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), integrated with Owner’s existing system.

C. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

D. Comply with the Owner’s Instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

E. Key Material: Provide keys of nickel silver only.

F. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.

1. Furnish one extra blank for each lock.

2. Deliver keys to key control system manufacturer.

3. Deliver keys to Owner’s representative.

2.6 PUSH/PULL UNITS:

A. Concealed Fasteners: Provide manufacturer’s special concealed fastener system for installation; through-bolted for matched pairs, but not for single units.

B. Decorative Units: Provide decorative push/pull sets in the design, finish, and fabricated from the indicated material.

2.7 CLOSERS AND DOOR CONTROL DEVICES:

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of us.

1. Where parallel arms are used, provide closer unit one size larger than recommended for use with standard arms.

B. Combination Door Closures and Holders: Provide units designed to hold door in open position under normal usage.

2.8 HARDWARE FINISHES:

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if not latch-lock sets) for color and texture.

B. Provide finishes which match those established by BHMA or, if none established, match the Engineer's sample and that established as building standard.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".

E. The designations used in schedules and elsewhere to indicate hardware finished are those listed in "Materials & Finishes Standard 1301" by BHMA, including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

F. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

1. Rust-Resistant Finish: For iron and steel base metal, required for exterior work, provide 0.2 mil thick copper coating on base metal before applying brass, bronze, nickel or chromium plated finishes.

PART 3 – EXECUTION

3.1 INSTALLATION:

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Engineer.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drilled and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.2 ADJUST AND CLEAN:

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

D. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and readjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.3 HARDWARE SETS:

HARDWARE SET #1: (Or approved equal)

(3) Hinges:	Stanley FBB-168, 4 ½"x 4 ½", Stainless steel finish, or approved equal.
(1) Lockset	Schlage D Series, Knob type to be determined by owner, Stainless steel finish or approved equal.
(1) Auxiliary Lock	Schlage B Series, Stainless steel finish, or approved equal
(1) Weatherstripping	Nat Guard 720 or approved equal
(1) Threshold	Pemko #2005AT or approved equal
(1) Door Stop	Robert Brooks And Associates GJ452 Aluminum 5" or approved equal
(1) Door Closer	Norton 1601SS or approved equal
(1) Panic Bar	Von Duprin

Note: All door hardware shall be as recommended by the door manufacturer. The above serve as examples of hardware required for this project.

PART 4 - QUANTITY AND PAYMENT

4.1 No specific payment shall be made for work under this section and all costs for said work shall be incorporated in various items in the bid proposal associated with this work.

END OF SECTION 087000

SECTION 099000

PAINTING AND FINISHES

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 surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Clay masonry.
3. Concrete masonry units (CMU).
4. Steel.
5. Cast iron/ Ductile iron/ Ferrous metals
6. Galvanized metal.
7. Aluminum (not anodized or otherwise coated).
8. Wood.
9. Gypsum board.
10. Plaster.
11. Spray-textured ceilings.
12. Cotton or canvas insulation covering.
13. ASJ insulation covering.

B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

B. Sustainable Design Submittals:

1. Product Data for LEED 2009 Credit EQ 4.2: For paints and coatings, showing printed statement of VOC content.

2. Laboratory Test Reports: For paints and coatings, indicating compliance with LEED 2009 Credit EQ 4.2 requirements for low-emitting materials.

C. Samples for Initial Selection: For each type of topcoat product.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Label each coat of each Sample.
3. Label each Sample for location and application area.

E. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Indicate VOC content.

1.4 CLOSEOUT SUBMITTALS

1. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials from the same manufacturer that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Owner’s Representative will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Owner’s Representative will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Owner’s Representative at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner’s Representative specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:

1. Product name and type (description).
2. Batch date.
3. Color number.
4. VOC content.
5. Environmental handling requirements.
6. Surface preparation requirements.
7. Application instructions.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Lead Paint: It is not expected that lead paint will be encountered in the Work.

1. If suspected lead paint is encountered, do not disturb; immediately notify Engineer and Owner.

D. Lead Paint: Lead paint may be present in buildings and structures to be painted. A report on the presence of lead paint is on file for review and use. Examine report to become aware of locations where lead paint is present.

1. Do not disturb lead paint or items suspected of containing hazardous materials except under procedures specified.
2. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated or comparable product from one of the following:

1. Sherwin Williams Company

2. Induron

3. Tnemec Coatings

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with Section 016000 "Product Requirements," and the following:

1. Products are approved by manufacturer in writing for application specified.
2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall provide materials that comply with VOC limits of authorities having jurisdiction and for interior paints and coatings applied at Project site, the following VOC limits exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
5. Floor Coatings: 100 g/L.
6. Shellacs, Clear: 730 g/L.
7. Shellacs, Pigmented: 550 g/L.

C. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers."

D. Colors: **As selected by Owner's Representative from manufacturer's full range**

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

    a. Concrete: 12 percent.
    b. Masonry (Clay and CMU): 12 percent.
    c. Wood: 15 percent.
    d. Gypsum Board: 12 percent.
    e. Plaster: 12 percent.

2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
3. Plaster Substrates: Verify that plaster is fully cured.

4. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal and Ferrous Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Owner's Representative, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces and Clay Masonry:

1. Latex System:

a. Prime Coat: Primer, latex, interior.

1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, or equal, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior, flat.

1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

d. Topcoat: Latex, interior, low sheen.

1) S-W ProMar 200 Zero VOC Latex Low Sheen Eg-Shel, B24-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, eggshell.

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat .

f. Topcoat: Latex, interior, semi-gloss.

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat .

g. Topcoat: Latex, interior, gloss.

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

2. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, or equal, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

d. Topcoat: Light industrial coating, interior, water based, semi-gloss:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

B. Concrete Substrates, Pedestrian Traffic Surfaces:

1. Latex Floor Enamel System:

a. First Coat: Floor paint, latex, slip-resistant, matching topcoat.
b. Topcoat: Floor paint, latex, slip-resistant, low gloss: S-W ArmorSeal Tread-Plex, B90 Series, or equal, at 1.5 to 2.0 mils (0.038 to 0.051 mm) dry per coat.

2. Clear Acrylic System, Gloss Finish:

a. First Coat:

1) S-W H&C Clarishield Water-Based Wet-Look Concrete Sealer, or equal, at 100 to 200 sq. ft. per gal. (2.45 to 4.91 sq. m per liter).

b. Second Coat:

1) S-W H&C Clarishield Water-Based Wet-Look Concrete Sealer, or equal, at 100 to 200 sq. ft. per gal. (2.45 to 4.91 sq. m per liter).

3. Concrete Stain System (Water-based):

a. First Coat: Low-luster opaque finish:

1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, or equal, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

b. Second Coat: Low-luster opaque finish:

1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, or equal, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

C. CMU Substrates:

1. Latex System:

a. Block Filler: Block filler, latex, interior/exterior:

1) S-W PrepRite Block Filler, B25W25, or equal at 75-125 sq. ft. per gal. (1.84 to 3.07 sq. m per liter).

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior, flat:

1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, or equal at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

d. Topcoat: Latex, interior, low sheen:

1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, eggshell:

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, or equal at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.

f. Topcoat: Latex, interior, semi-gloss:

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, or equal at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

g. Topcoat: Latex, interior, gloss:

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

2. Water-Based Light Industrial Coating System:

a. Block Filler: Block filler, latex, interior/exterior:

1) S-W PrepRite Block Filler, B25W25, or equal at 75-125 sq. ft. per gal. (1.84 to 3.07 sq. m per liter).

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

d. Topcoat: Light industrial coating, interior, water based, semi-gloss:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

3. Concrete Stain System (Water-based):

a. First Coat:

1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, or equal at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

b. Second Coat:

1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, or equal at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

D. Metal Substrates (Aluminum, Steel, Galvanized Steel, Ductile Iron, Ferrous Metals):

1. Latex System:

a. Prime Coat: Primer, rust-inhibitive, water based:

1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, or equal at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Water-based acrylic, interior, matching topcoat.

c. Topcoat: Water-based acrylic, semi-gloss:

1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, or equal at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

d. Topcoat: Water-based acrylic, gloss:

1) S-W Pro Industrial Acrylic Gloss Coating, B66-660 Series, or equal at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

2. Water-Based Dry-Fall System:

a. Top Coat: Dry-fall latex, flat:

1) S-W Pro Industrial Waterborne Acrylic Dryfall Flat, B42-181 Series, or equal at 6.0 mils (0.152 mm) wet, 1.5 mils (0.038 mm) dry.

b. Top Coat: Dry-fall latex, eggshell:

1) S-W Pro Industrial Waterborne Acrylic DryFall Eg-Shel, B42-82, or equal at 6.0 mils (0.152 mm) wet, 1.9 mils (0.048 mm) dry.

c. Top Coat: Dry-fall latex, semi-gloss:

1) S-W Pro Industrial Waterborne Acrylic DryFall Semi-Gloss, B42-83, or equal at 5.8 mils (0.147 mm) wet, 2.3 mils (0.058 mm) dry.

3. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, rust-inhibitive, water based:

1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, or equal at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

d. Topcoat: Light industrial coating, interior, water based, semi-gloss:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

4. Waterbased/Alkyd Urethane System:

a. Prime Coat:

1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, or equal at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Water-based acrylic-alkyd, interior, matching topcoat.

c. Topcoat: Water-based alkyd-urethane, semi-gloss, interior:

1) S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, or equal at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

d. Topcoat: Water-based alkyd-urethane, gloss, interior:

1) S-W Pro Industrial Waterbased Alkyd Urethane Gloss, B53-1050 Series, or equal at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

E. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.

1. Latex System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W PrepRite ProBlock Primer Sealer, B51-620 Series, or equal at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry.

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior, eggshell:

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, or equal at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.

d. Topcoat: Latex, interior, semi-gloss:

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, or equal at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, gloss:

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

2. Waterbased/Alkyd Urethane System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W Premium Wall & Wood Primer, B28W8111, or equal at 4.0 mils (0.102 mm) wet, 1.8 mils (0.046 mm) dry.

b. Intermediate Coat: Water-based alkyd-urethane, interior, matching topcoat.

c. Topcoat: Water-based alkyd-urethane, semi-gloss, interior:

1) S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

d. Topcoat: Water-based alkyd-urethane, gloss, interior:

1) S-W Pro Industrial Waterbased Alkyd Urethane Gloss, B53-1050 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

3. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W PrepRite ProBlock Primer Sealer, B51-620 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry.

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

d. Topcoat: Light industrial coating, interior, water based, semi-gloss:

1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

F. Wood Substrates, Pedestrian Traffic Surfaces:

1. Latex Floor Enamel System:

a. First Coat: Floor paint, latex, slip-resistant, matching topcoat.

b. Topcoat: Floor paint, latex, slip-resistant, low gloss:

1) S-W ArmorSeal Tread-Plex, B90 Series, or equal at 1.5 to 2.0 mils (0.038 to 0.051 mm) dry per coat.

G. **Gypsum Board and Spray-Texture Ceiling** Substrates:

1. Latex System:

a. Prime Coat: Primer, latex, interior:

1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, or equal at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.

b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat:

1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

d. Topcoat: Latex, interior, low sheen:

1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, eggshell:

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.

f. Topcoat: Latex, interior, semi-gloss:

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

g. Topcoat: Latex, interior, gloss:

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, or equal, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

2. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, or equal, at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

1) S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

d. Topcoat: Light industrial coating, interior, water based, semi-gloss:

1) S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46-151 Series, or equal at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

PART 4 - QUANTITY AND PAYMENT

4.1 No specific payment shall be made for work under this section and all costs for said work shall be incorporated in various items in the bid proposal associated with this work.

END OF SECTION 099000

SECTION 400567

FLOW CONTROL VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. This specification covers the design, manufacture, and testing of 1-1/2in. (40 mm) through 36 in. (900 mm) Control Valves

B. Related Requirements:

   1. Section 400551 "Common Requirements for Process Valves" for basic materials and methods related to valves commonly used for process systems.

1.2 COORDINATION

A. Coordinate Work of this Section with process piping Work.

1.3 SUBMITTALS

A. Product Data: Flow Control Valves.

B. Source Quality-Control Reports: For flow control valves.

C. Field Quality-Control Reports: For flow control valves.

D. Qualifications Statements: For manufacturer and installer.

E. Manufacturer's Approval: For installer.

1.4 QUALITY ASSURANCE

A. Materials in Contact with Potable Water: Certified to NSF 61 and NSF 372.

B. Manufacturers Qualifications: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

C. Installers Qualifications: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

D. Packing and Shipping

1. Control valves specified herein shall be factory assembled. Any control valve appurtenances, accessories, parts and assemblies that are shipped unassembled shall be packaged and tagged in a manner that will protect the equipment from damage and facilitate the final assembly in the field.
2. Care shall be taken in loading, transporting and unloading to protect control valves, appurtenances, or coatings from damage. Equipment shall not be dropped. All control valves and appurtenances shall be examined before installation and no piece shall be installed which is found to be defective. Any damage(s) shall be repaired.
3. Prior to shipping, the control valves and all associated accessories shall be acceptably packaged and covered to prevent entry of foreign material.
4. All packaged control valves shall be shipped, remain covered and stored on site until they are installed and put into use.

1.6 WARRANTY

A. Furnish five-year manufacturer's warranty for flow control valves and pressure-sustaining valves against cavitation damage.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Perform Work according to:

1. The State of New Jersey Department of Transportation standards.
2. The Municipality of Pennsauken Department of Public Works standards.

2.2 PRESSURE-REDUCING VALVES

A. Manufacturers:
1. CLA-VAL, 40-01 (Basis of design)
2. Clow Valve Company; a subsidiary of McWane, Inc.
3. GA Industries, Inc.

4. Or approved equal.

B. Function

1. The Rate of Flow Control Valve shall automatically throttle and limit flow to a preset maximum rate, regardless of changing line pressure, by sensing the differential across a sized orifice plate. Flow rate is adjustable by changing the pilot set point. When differential pressure across the orifice plate is less than the pilot set-point the rate of valve opens allowing flow to meet the pre-determined demand. If differential pressure across the orifice plate exceeds the pilot set point, the rate of flow valve closes, limiting the flow to a preset maximum.

C. Materials

1. Material Specification for the Rate of Flow Control Valves Main Valve as follows:

Component	Material
Body & Cover	Ductile Iron-ASTM A536.
Main Valve Trim	Stainless Steel.
Seat	Stainless Stee.
Stem, Nut and Spring	Stainless Steel
Seal Disc	Buna-N® Rubber
Diaphragm	Nylon Reinforced Buna-N® Rubber.
Internal Trim Parts	Stainless Steel
End Detail	Flanged (1-1/2" – 36")
Pressure Rating	Class 150 lb. (250psi Max.)
Temperature Range	Water to 180°F

Any other wetted metallic parts: Stainless Steel; Bronze; Brass

Coating Fusion Bonded Epoxy Coating (Interior and Exterior);

D. Manufacturer

1. Main Valve

a. The main valve shall be hydraulically operated, single diaphragm actuated, globe pattern. The valve shall consist of three major components; the body with seat installed, the cover with bearing installed and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from line pressure. Packing glands, stuffing boxes and/or rolling diaphragm technology will not be permitted and there shall be no pistons operating the main valve or pilot controls. No fabrication or welding shall be

used in the manufacturing process. Y-pattern valves shall not be permitted. Main valve shall comply with NSF/ANSI Standard 61 and certified lead free to NSF/ANSI 372 as a safe drinking water system component.

2. Main Valve End Connections:

    a. End Connections for control valve shall be flanged per ASME/ANSI B16.42, Class 150.

3. Main Valve Body:

    a. No separate chamber(s) below the diaphragm shall be allowed between the main valve cover and body. No fabrication or welding shall be used in the manufacturing process.
    b. The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the discs firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hours-glass shaped disc retainers shall be permitted and no V-type or slotted-type disc guides shall be used.
    c. The diaphragm assembly containing a non-magnetic 303 stainless steel stem; of sufficient diameter to withstand high hydraulic pressures and shall be fully guided at both ends by a bearing in the main valve cover and an integral bearing in the valve seat. The valve seat shall be a solid, one-piece design and shall have a minimum five-degree taper on the seating surface for a positive, drip-tight shut off. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from the line pressure. No bolts or cap screws shall be permitted for use in the construction of the diaphragm assembly.
    d. The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The diaphragm's center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 X per layer of nylon fabric and shall be cycled tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position. Bellofram type rolling diaphragms shall not be permitted.
    e. The main valve seat and stem bearing in the valve cover shall be removable. The cover bearing and seat in the 6" and smaller size valve shall be threaded into the cover and body. The valve seat in the 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem,

the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. The valve shall be designed such that both the cover assembly and internal diaphragm assembly can be disassembled and lifted vertically straight up from the top of a narrow opening/vault. Y-pattern valves shall not be permitted. The seat shall be of the solid one piece design. Two piece seats or seat inserts shall not be permitted. Packing glands and/or stuffing boxes shall not be permitted.

4. Pilot Control System:

   a. The rate of flow pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve designed to close when the controlling differential exceeds the adjustable spring setting. The pilot control is normally held open by the force of the compression on the spring above the diaphragm and it closes when the pressure acting on the underside of the diaphragm exceeds the spring setting. The pilot control shall have a second downstream sensing port which can be utilized to install a pressure gauge. Pilot shall comply with NSF/ANSI 61 and certified lead free to NSF/ANSI 372 as a safe drinking water system component.
   b. The pilot control system shall include a strainer, a fixed orifice closing speed and all required control accessories, equipment, control tubing and fittings. No variable orifices shall be permitted. Pilot to be manufactured by control valve manufacturer.
   c. An orifice plate flange assembly shall be included and mounted one to five pipe diameters downstream of the rate of flow control valve. The contractor shall connect the sensing line between the pilot system and the orifice plate assembly.

5. Material Specification for Pilot Control System:

Component	Material
Rate of Flow Pilot Control	
Body & Cover	UNS C87850 Stainless Steel
Pilot Trim	Stainless Steel 303
Rubber	Buna-N®
Connections	FNPT
Pressure rating	400 psi Max.
Temperature Range	Water to 180°F Max.
Pilot Control Tubing	Copper *Stainless Steel, Flexible Braided Stainless Steel*
Pilot Control Fittings	*Stainless Steel*
Orifice Plate Assembly	
Plate Holder	Ductile Iron-ASTM A536 (standard)
Orifice Plate	Stainless Steel 302
Sensing Connections	FNPT

6. Factory Assembly

    a. Each control valve shall be factory assembled.
    b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008.
    c. For all control valves, the factory assembly shall include the complete main valve, pilot valve(s), and all associated accessories and control equipment.
    d. During factory assembly the control valve manufacture shall make all necessary adjustments and correct any defects.

7. Nameplates:

    a. Each Control Valve, associated pilot(s) and orifice plate assembly shall be provided with an identifying nameplate.
    b. Nameplates, depending on type and size of control valve, shall be mounted in the most practical position possible, typically on the inlet side of the valve body.
    c. Nameplates shall be brass and a minimum of 3/32" thick, ¾" high and 2-3/4" long.
    d. Pertinent control valve data shall be etched or stamped into the nameplate. Data shall include control valve Catalog number, function, size, material, pressure rating, end-connection details, type of pilot controls used and control adjustment range.

8. Factory Testing:

    a. Each control valve shall be factory tested.
    b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008
    c. Tests shall conform to approved test procedures.
    d. The standard factory tests shall include a valve body and cover leakage test, seat leakage test and a stroke test. Control valves and pilot valves, in the partially open position, with both ends closed off with blind flanges (valves) and pipe plugs (pilots), shall be subject to an air test. The applied air pressure shall be 90 psi minimum. All air pressure tests shall be applied for a minimum of 15 minutes. No visible leakage is permitted through the valve seat, the pressure boundary walls of the valve body, valve cover, pilot body, pilot cover or the body-cover joint.
    e. Control valve manufacturer shall, upon request, offer additional testing, such as high pressure hydrostatic testing, positive material inspection testing, ferrite testing, liquid penetration inspection testing, magnetic particle examination testing and radiographic examination testing.

E. Product Data
    1. The following information shall be provided:
        a. Control Valve manufacturer's technical product data.
        b. Control Valve manufacturer's Installation, Operation and Maintenance manual (IOM).
    2. Provide specific information on all optional features specified above and confirm that these items are provided.
    3. The valve manufacturer shall be able to supply a complete line of equipment from 1" through 36" sizes and a complete selection of complementary accessories and equipment.

4. The control valve manufacture shall provide a computerized cavitation analysis report which shows flow rate, differential pressure, and percentage of valve opening. Cv factor, system velocity, and if there will be cavitation damage.

2.3 SOURCE QUALITY CONTROL

A. Testing:

1. Leakage Testing:

a. Test each assembled valve hydrostatically at 1-1/2 times rated working pressure for minimum five minutes.
b. Test each valve for leakage at rated working pressure against closed valve.
c. Permitted Leakage: None.

2. Functional Testing:

a. Test each valve to verify specified performance.

B. Owner Inspection:

1. Make completed flow-control valves available for inspection at manufacturer's factory prior to packaging for shipment.
2. Notify Owner at least seven days before inspection is allowed.

C. Owner Witnessing:

1. Allow witnessing of factory inspections and test at manufacturer's test facility.
2. Notify Owner at least sevendays before inspections and tests are scheduled.

D. Certificate of Compliance:

1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. As specified in Section 400551 "Common Requirements for Process Valves."

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

3.2 INSTALLATION

A. As specified in Section 400551 "Common Requirements for Process Valves."

B. Install protective strainers upstream of solenoid valves, PRVs, and pressure-sustaining valves.

3.3 FIELD QUALITY CONTROL

A. As specified in Section 400551 "Common Requirements for Process Valves."

B. Prepare test and inspection reports.

PART 4 – QUANTITY AND PAYMENT

No separate payment shall be made for the flow control valves. Contractor shall include the cost for the items in this section required for a complete installation in the lump sum bid price “PROCESS PIPING, VALVES, FITTING AND APPURTENANCES, COMPLETE” as provided in the Bid Form.

END OF SECTION 400567

REVISED BID FORM

BID FORM

Pursuant to and in compliance with your Advertisement for Bids and the Information for Bidders relating thereto, the undersigned hereby offers to furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary for, or proper for, or incidental to the BROWNING ROAD WATER TREATMENT PLANT IMPROVEMENTS, as required by, and in strict accordance with the applicable provisions of plans and specifications and all addenda issued by the MERCHANTVILLE PENNSAUKEN WATER COMMISSION or its Engineer prior to the date of opening the bids, whether received by the

NOTE: Extension of Unit Prices must be exact.

BASE BID

Item	Quantity	Units	Description	Unit Price	Amount
1	1	LS	MOBILIZATION & DEMOBILIZATION (MAX. 3% PER N.J.A.C. 7:14-2.9)	$	$
2	1	LS	ENVIRONMENTAL AND CULTURAL RESOURCE PROTECTION AND RESTORATION	$	$
3	1	LS	SOIL EROSION AND SEDIMENT CONTROL	$	$
4	1	LS	SITE DEMOLITION, COMPLETE	$	$
5	1	LS	SITE CLEARING, ROUGH GRADING, EXCAVATION, HAULING AND GRADING COMPLETE	$	$
6	2	UN	TEST PIT CONVENTIONAL	$	$
7	1	UN	TEST PIT SOFT DIG	$	$
8	1	LS	CMU TREATMENT BUILDING , COMPLETE	$	$
9	1	LS	SITE PIPING, VALVES FITTINGS HYDRANTS AND APPURTENANCES, COMPLETE	$	$

Item	Quantity	Units	Description	Unit Price	Amount
10	1	LS	GRANULAR ACTIVATED CARBON TREATMENT SYSTEM INSTALLATION, COMPLETE	$	$
11	1	LS	ADVANCED OXIDATION PROCESS, INCLUDING HYDROGEN PEROXIDE FEED SYSTEM AND UV DISINFECTION SYSTEM, COMPLETE	$	$
12	1	LS	CHEMICAL TANKS AND FEED SYSTEMS INCLUDING INSTALLATION, COMPLETE	$	$
13	1	LS	PROCESS PIPING, VALVES FITTINGS AND APPURTENANCES, COMPLETE	$	$
14	1	LS	INSTRUMENTATION AND CONTROL SYSTEM, COMPLETE	$	$
15	1	LS	SUPPLY AND INSTALLATION OF HIGH SERVICE BOOSTER PUMPING, EQUIPMENT AND UPGRADES, COMPLETE	$	$
16	1	LS	AUXILIARY POWER GENERATOR SET AND ASSOCIATED EQUIPMENT , COMPLETE	$	$
17	1	LS	ALL MECHANICAL WORK FOR THE NEW TREATMENT BUILDING, INCLUDING HEATING AND VENTILATING SYSTEMS AND DEHUMIFICATION SYSTEM, COMPLETE	$	$
18	1	LS	ALL ELECTRICAL WORK FOR THE TREATMENT BUILDING IMPROVEMENTS , COMPLETE	$	$

Item	Quantity	Units	Description	Unit Price	Amount
19	1	LS	ALL COLD AND HOT WATER PLUMBING WORK FOR THE TREATMENT BUILDING IMPROVEMENTS AND ACCESSORIES, COMPLETE	$	$
20	1	LS	START-UP, TESTING AND PLACING THE NEW TREATMENT FACILITY INTO PERMANENT SERVICE , COMPLETE	$	$
21	1	LS	INSTALLATION OF NEW SEWER LINE, COMPLETE	$	$
22	1	LS	FINAL SITE RESTORATION AND LANDSCAPING, COMPLETE	$	$
23	1	LS	PROVIDE AND INSTALL BUILDING LIGHTNING PROTECTION, COMPLETE	$	$
24	1	LS	ALLOWANCE FOR SCADA INTEGRATION, COMPLETE	$ 150,000.00	$ 150,000.00
25	1	LS	ALLOWANCE FOR COORDINATION WITH PSE&G FOR GAS LINE RELOCATION, MISCELLENEOUS FEES AND ALL WORK ASSOCIATED WITH THE GAS SERVICE	$ 65,000.00	$ 65,000.00
26	1	LS	ALLOWANCE FOR COORDINATION WITH PSE&G FOR POLE AND ELECTRICAL LINE RELOCATION, SUPPLY AND INSTALLATION OF TRANSFORMER, MISCELLENEOUS FEES AND ALL WORK ASSOCIATED WITH THE ELECTRIC SERVICE	$ 75,000.00	$ 75,000.00
27	1	LS	ALLOWANCE FOR UNFORSEEN CONDITIONS	$ 100,000.00	$ 100,000.00

Item	Quantity	Units	Description	Unit Price	Amount

TOTAL CONSTRUCTION COST, BASE BID Items #1 - #27, Inclusive

$ _____

_____

_____

TOTAL AMOUNT BID WRITTEN OUT

_____

SIGNATURE **NAME & TITLE**

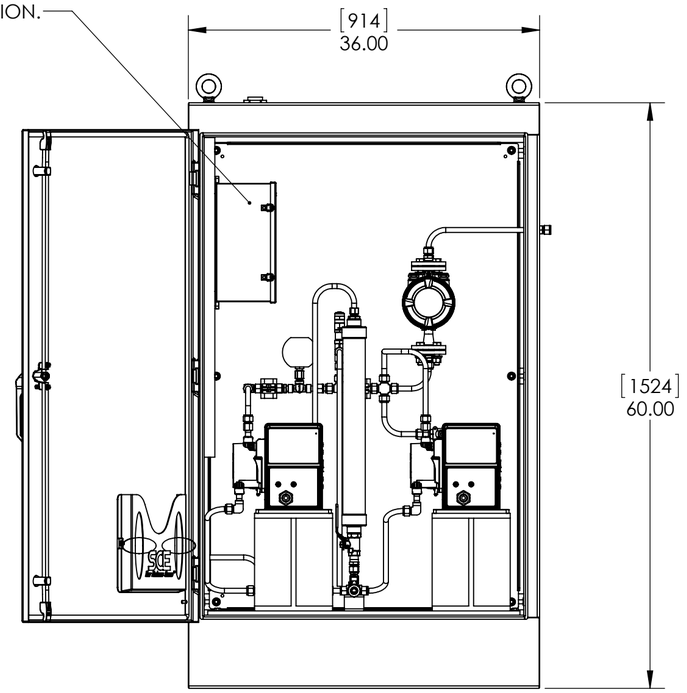
_____

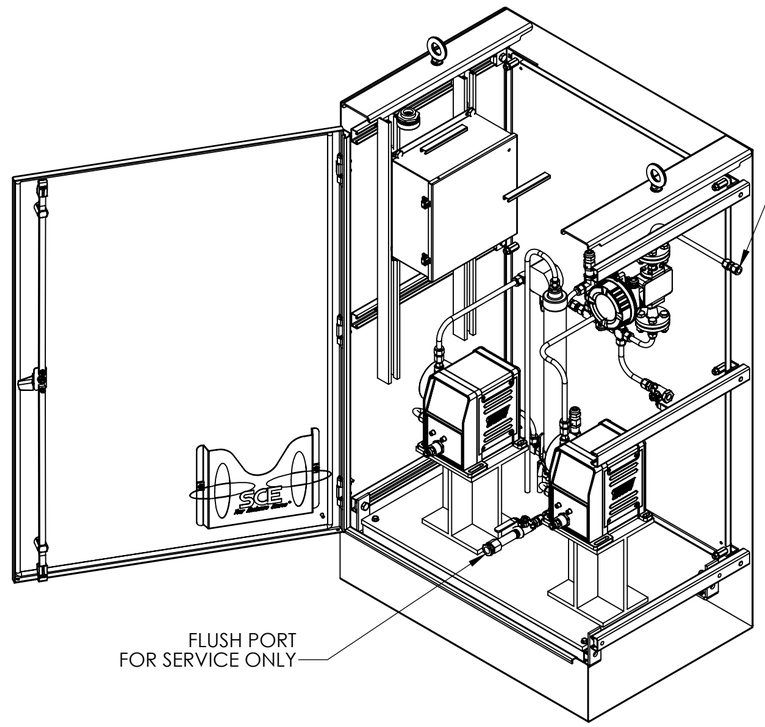
BID DATE **COMPANY NAME**

CUT SHEETS

REV	SHT	ZONE	REVISION DESCRIPTION	LOG NO.	REV BY	CHK BY	APPD BY	DATE YYYY-MM-DD
A			DRAWING RELEASED					

THIS PANEL
OPTIONAL BASED
ON APPLICATION.





TOP AND SIDE HIDDEN FOR CLARITY

USPT P/N 1120A TYPICAL SYSTEM DATA	
TYP. FLOW	0.02-15.9 GPM / 0.076- 60.2 LPM
SIZE	60"X30X"25" (152cmx91cm X63cm)
ELECTRICAL*	120vac/2@20 AMPS(EA)/60Hz
WEIGHT	TBD
	* TWO CIRCUITS (20A EA.)

UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW:
2 PL DEC ± 0.01
3 PL DEC ± 0.005
ANGLE ± 1.0

REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. CRITICAL CHARACTERISTIC

THIRD ANGLE PROJECTION

SolidWorks MAINTAINED DATA. CHANGES SHALL BE INCORPORATED ELECTRONICALLY

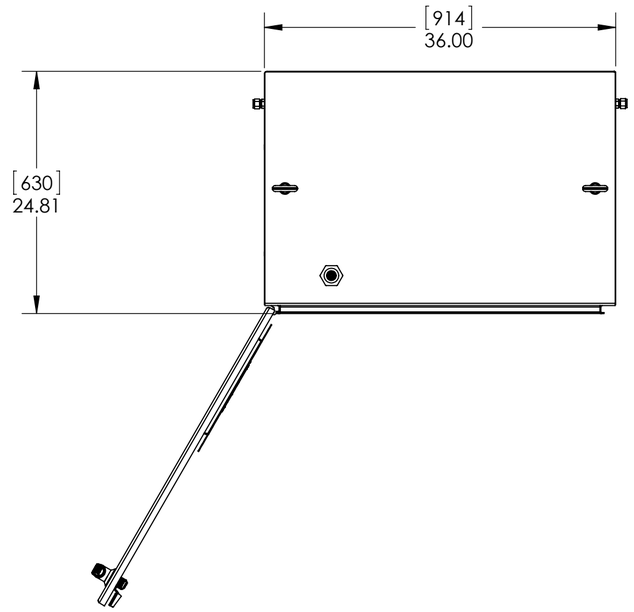
USP technologies

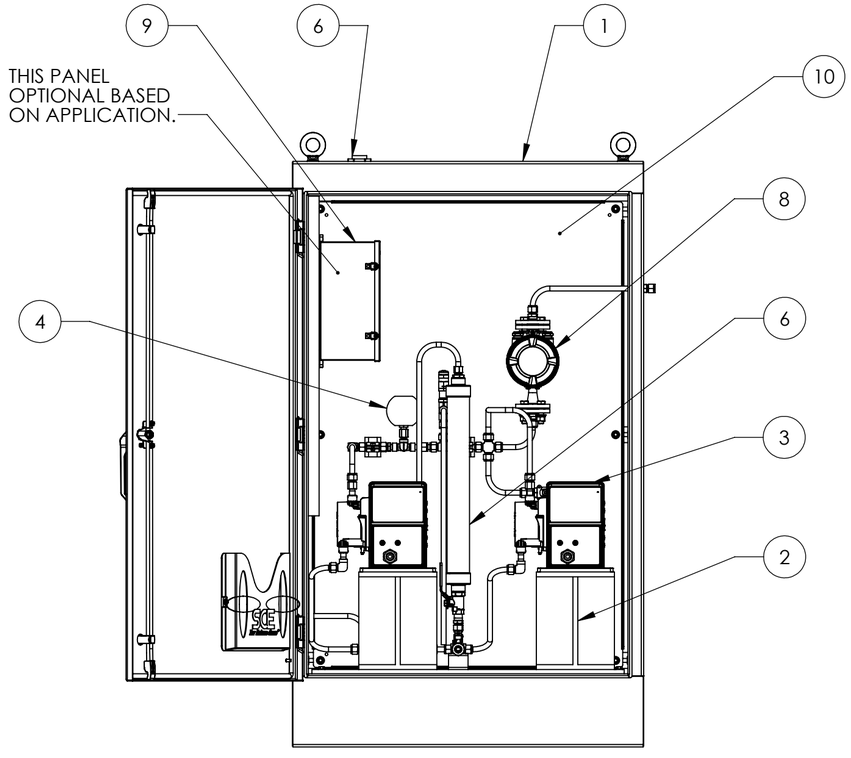
900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION
SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

DRAWN BY		DWG NO.			REV
CREATED ON		1120_A			A
RELEASE LOG #	MASS: 1051.99 lbs	SCALE: 1:12	SHEET 1 OF 7	SIZE C	

CURRENT STATUS: NOT VAULTED





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
38	5300-045	TUBING, WELDED 1/2-.035 4"L	1
10	SCE-60P36F1	PANEL, 32"X48"	1
9	SCE-1212CHNF	ELECTRICAL ENCLOSURE, 12" WIDTH	1
8	5H1B02	FLOWMETER, 5H1B02	1
6	VENT	VENT, BREATHER ENCLOSURE M40X1.5 ABS	1
6	7302236	CALIBRATION CYLINDER 1000mL, 3/4 FNPT	1
5	SS RL4S8 NE	PRV, 1/2" SS	2
4	3404	GAUGE, PRESSURE DIGI TRANSMIT N4X	1
3	9988_A	PUMP, WATSON MARLOW-QDOS60	2
2	8053	PUMP, MOUNT LARGE PROM	2
1	SCE-603624FS	ENCLOSURE, STEEL, 60"X36"X24"	1

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ANGLE ± 1.0

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THIRD ANGLE PROJECTION

SolidWorks MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY

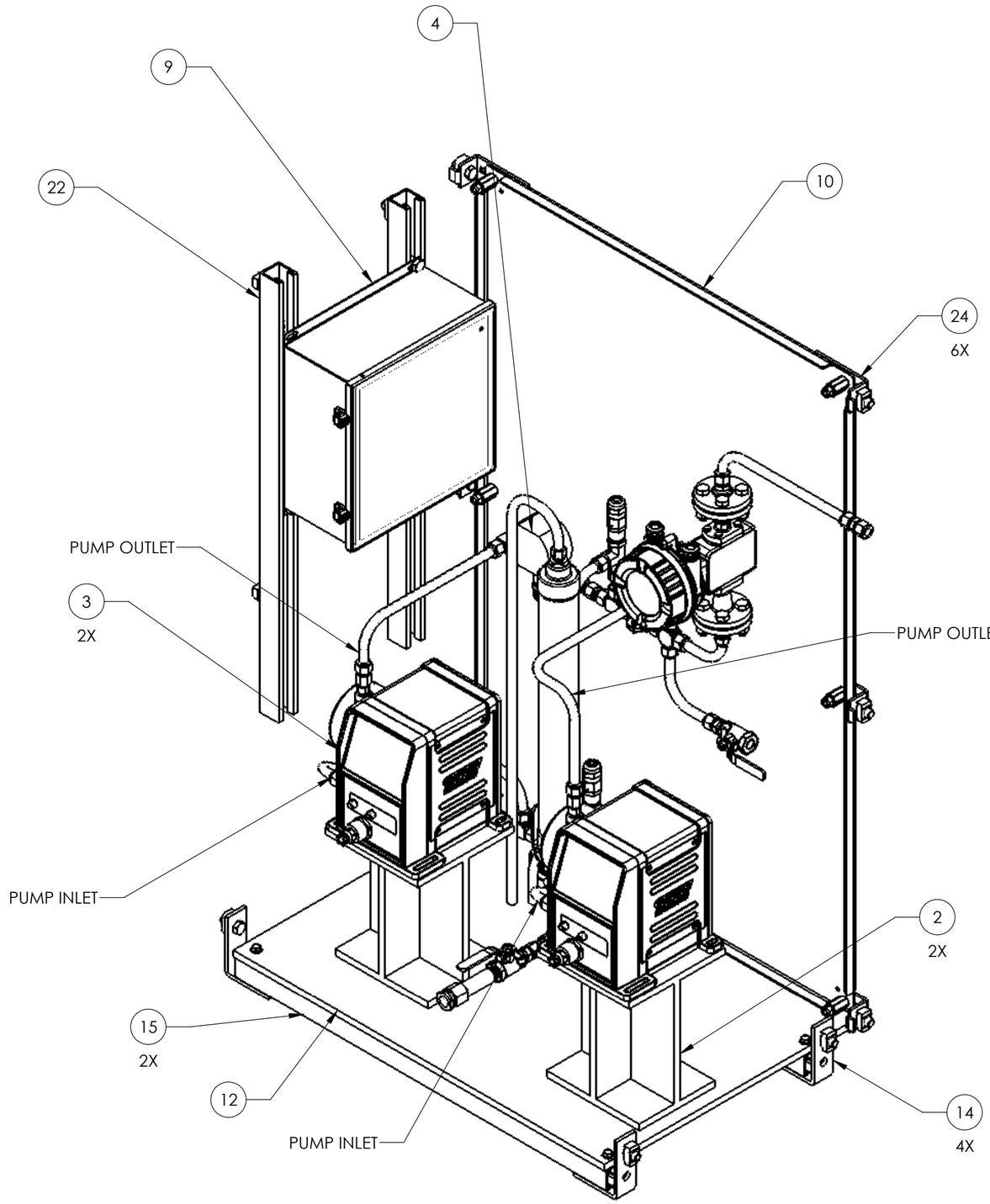
USP technologies
900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION: SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

DRAWN BY	DWG NO.	REV
CREATED ON	1120_A	A
RELEASE LOG #	MASS: 109.38 lbs / SCALE: 1:12 / SHEET 2 OF 7 / SIZE C	

CURRENT STATUS: NOT VAULTED

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
56	4328	UNISTRUT CLAMP ASSY, SSTUBE 1/2	4
55	5114	ELBOW, 90 1/2T UNION SS	1
54	5230	CONNECTOR, 1/2T-1/4FNPT SS	2
53	50915K329	NIPPLE, 3/4 NPT- 1/2"	1
52	5105	ELBOW, 90 1/4 FNPT SS40	1
51	51205K311	SNUBBER, GAGE 1/4" SS	1
50	5313	NIPPLE, 1/4 MNPT x 1.5L SS40	1
48	5231	CONNECTOR, 1/2T-1/4MNPT SS	2
48	5005	TEE, 1/4 FNPT 3000lb SS	1
47	5015	CROSS, 1/2 TUBE UNION SS	1
46	5225	UNION, 1/2 SWAGELOCK TUBE	2
45	5312	NIPPLE, 1/2 MNPT x 4L SS40	1
44	5201	ADAPTER, GARDEN HOSE-1/2NPT SS	1
43	5402	VALVE, BALL VENTED 1/2FNPT SS	3
42	5229	CONNECTOR, 1/2T-1/2MNPT SS	5
41	5009	TEE, UNION 1/2T SWAGELOCK	5
40	5269	ELBOW, 90 1/2T-1/4FNPT SS	2
39	9429-1	CHECK, 1/4MPT ADJ150-300psi SS	4
38	5300-045	TUBING, WELDED 1/2-.035 4"L	1
37	5300-355	TUBING, WELDED 1/2-.035 12.0"L	1
36	5300-240	TUBING, WELDED 1/2-.035 24"L	1
35	5300-139	TUBING, WELDED 1/2-.035 13.9"L	1
34	5300-200	TUBING, WELDED 1/2-.035 20"L	1
33	5300-120	TUBING, WELDED 1/2-.035 12.0"L	1
32	5300-260	TUBING, WELDED 1/2-.035 26.0"L	1
31	5300-090	TUBING, WELDED 1/2-.035 29.5"L	1
30	5300-060	TUBING, WELDED 1/2-.035 6.0"L	3
29	5300-040	TUBING, WELDED 1/2-.035 4"L	1
28	5300-020	TUBING, WELDED 1/2-.035 2"L	8
27	5300-190	TUBING, WELDED 1/2-.035 20.0"L	1
26	93298A130	FLANGE NUT	6
25	STANDOFF	STANDOFF, HEX 3/8-16-1.25"L	6
24	Unistrut_bracket	UNISTRUT BRACKET, 90 1-5/8 SS	6
23	RD HEAD SQ NECK BOLT	BOLT,ROUND HEAD 3/8"-16 X 2.00"L	6
22	4304-036	UNISTRUT CHANNEL, 1-5/8"x1-5/8"x 36"L	2
21	4101	NUT, HEX TI 1/2-13	8
20	4205	WASHER, LOCK TI 1/2	8
19	4204	WASHER, FLAT TI 1/2	8
18	BOLT 2L	BOLT, HEX CAP TI 1/2-13X2 Ti	8
17	Flange	FLANGE, 1/2FLNG-1/2FNPT	2
16	90096A585	SCREW,SELF TAPPING 5/16"-18X1.25	4
15	4304-030	UNISTRUT CHANNEL, 1-5/8"x1-5/8"x32"L	2
14	4303	UNISTRUT BRACKET, 90 1-5/8 SS	4
13	4326	UNISTRUT BOLT, FG 1/2-13 x 1.25"	22
12	9453	TEXTURED HDPE-1/2"X30"X56-3/4"	1
11	4313	UNISTRUT NUT, 1/2 NoSPRG SST	22



UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW:
2 PL DEC ± 0.01
3 PL DEC ± 0.005
ANGLE ± 1.0

REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. CRITICAL CHARACTERISTIC

THIRD ANGLE PROJECTION

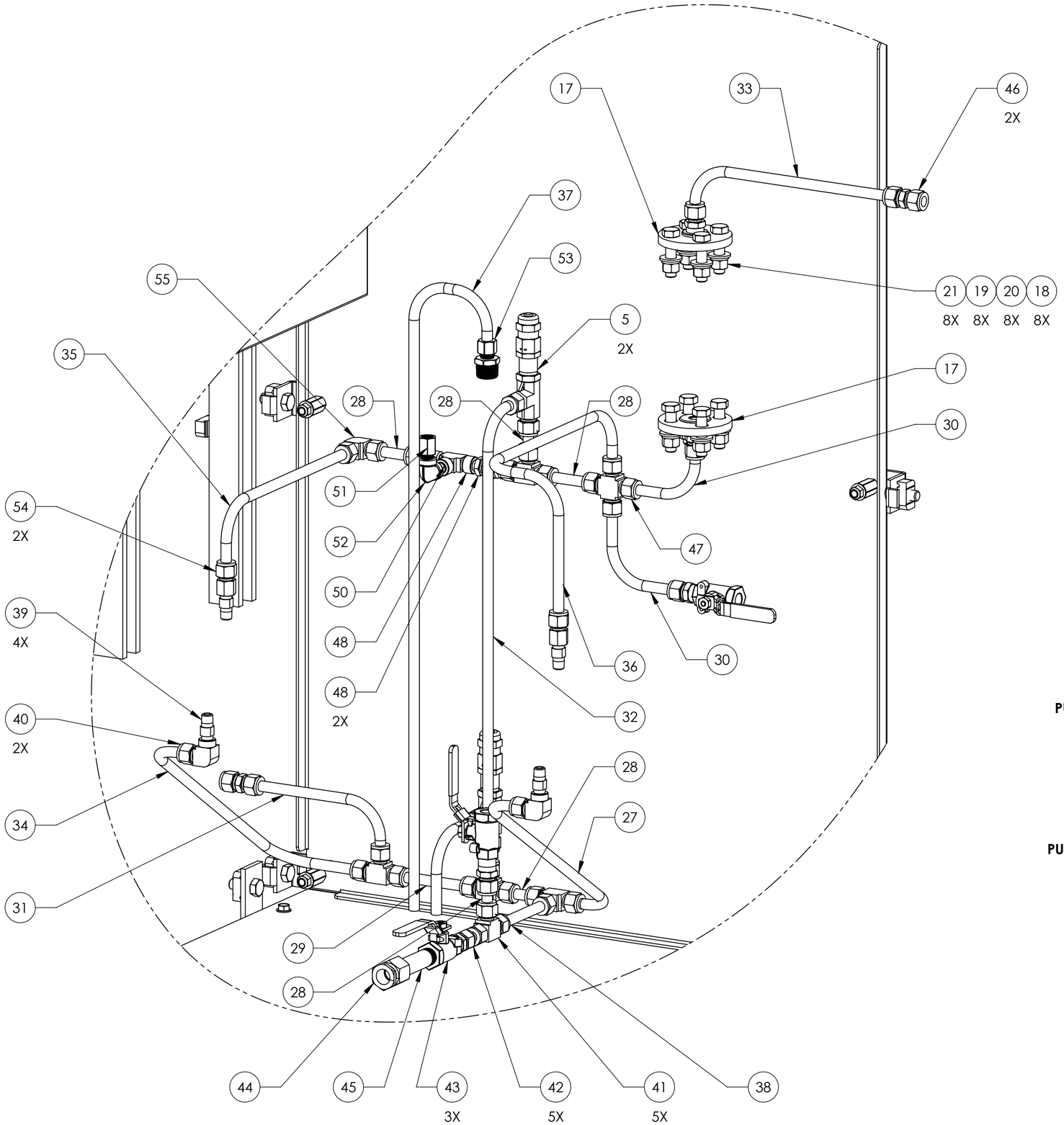
SolidWorks MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY

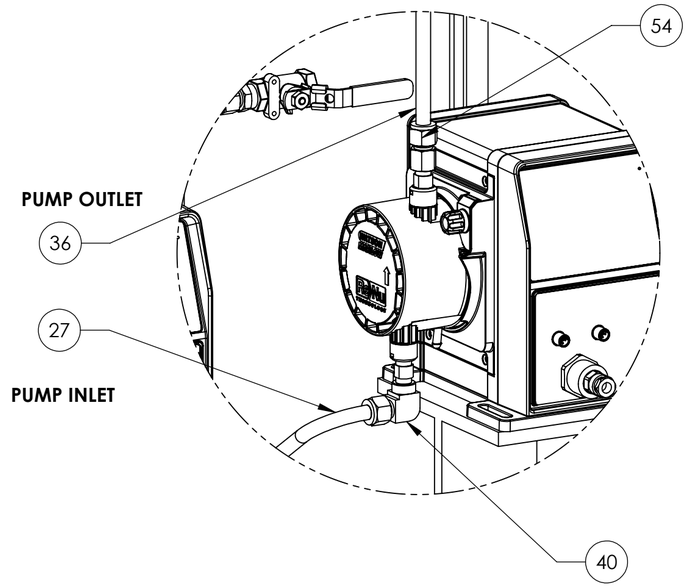
ologies

900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION: SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

DRAWN BY	DWG NO. 1120_A			REV A
CREATED ON				
RELEASE LOG #	MASS: 109.38 lbs	SCALE: 1:6	SHEET 3 OF 7	SIZE C





PLUMBING DETAILS OF PUMP PORTS

NOTE :

1/ ALL THE UNISTRUT CLAMPS (ITEM 56)NEEDS TO BE ASSEMBLED AT REQUIRED LOCATIONS AS SHOWN IN SHEET 5, AFTER THE PLUMBING TREE POSITION IS FIXED.

UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW:
2 PL DEC ± 0.01
3 PL DEC ± 0.005
ANGLE ± 1.0

REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. CRITICAL CHARACTERISTIC

THIRD ANGLE PROJECTION

SolidWorks MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY

DRAWN BY

CREATED ON

RELEASE LOG #

USP technologies

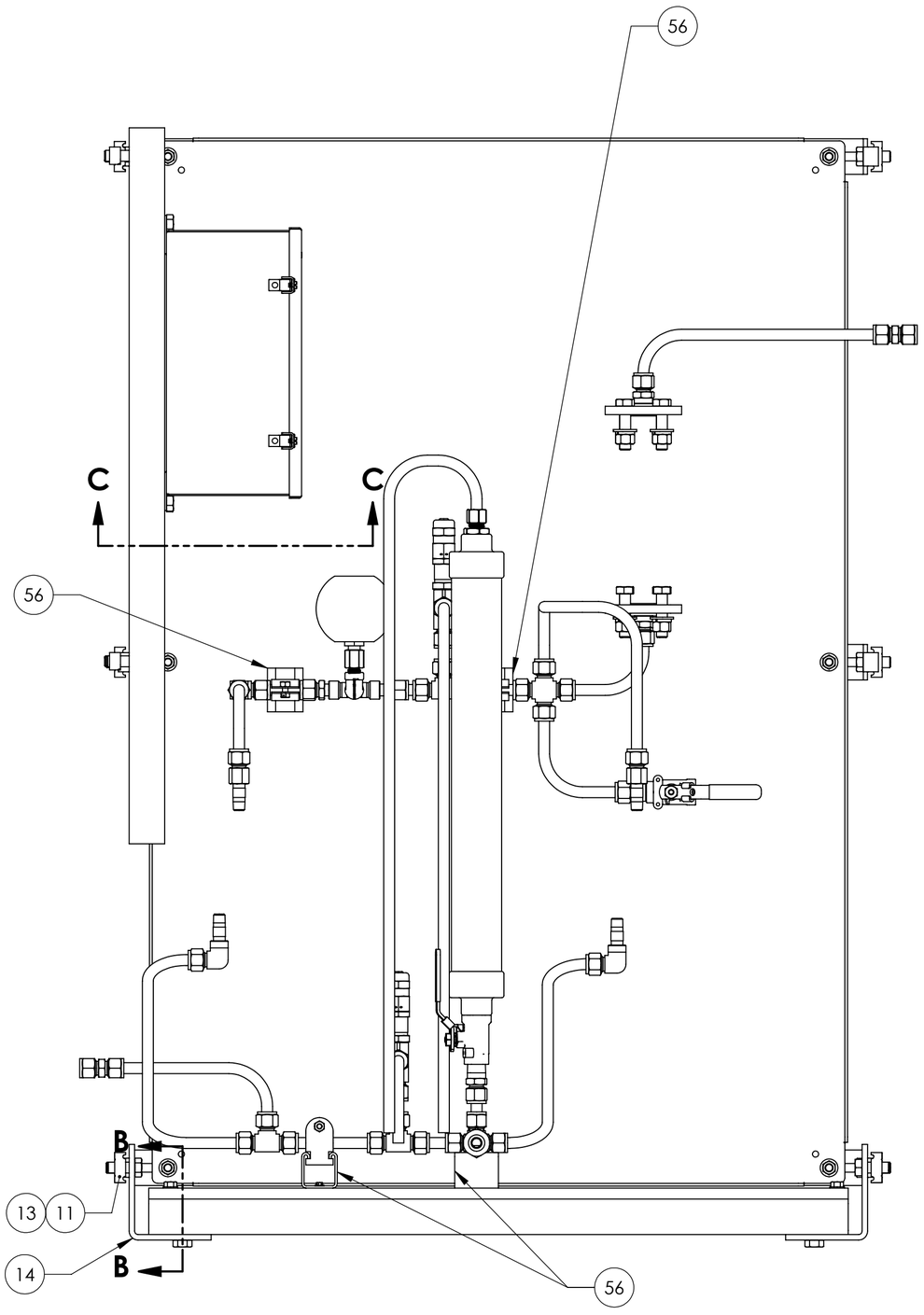
900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION
SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

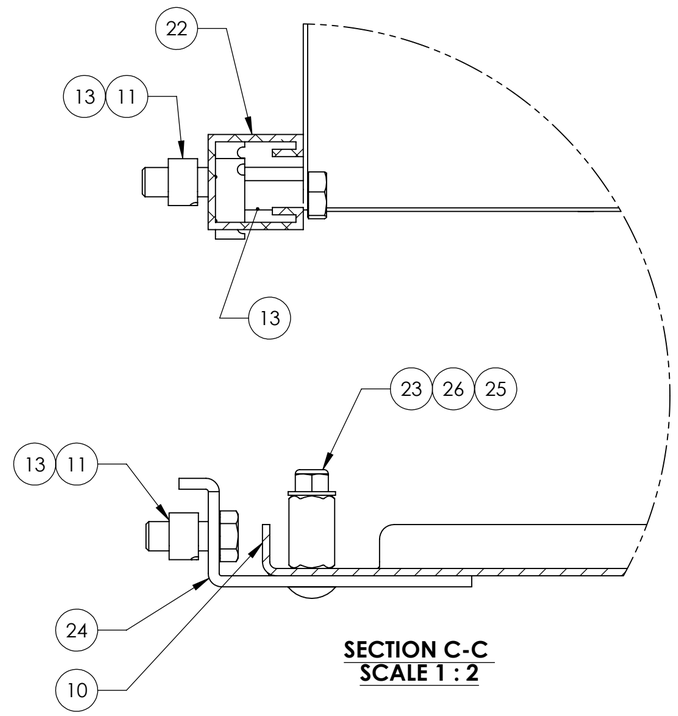
DWG NO. 1120_A

REV A

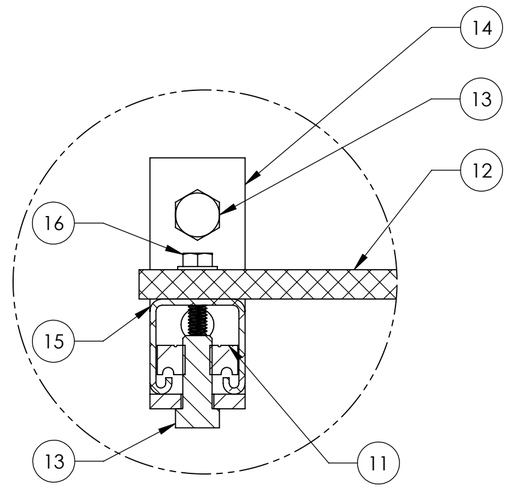
MASS: 109.38 lbs | SCALE: 1:4 | SHEET 4 OF 7 | SIZE C



FRONT VIEW
VIEW SHOWING LOCATIONS OF TUBE CLAMPS ON BACK BOARD ENCLOSURE AND PUMPS HIDDEN FOR CLARITY.



SECTION C-C
SCALE 1 : 2



SECTION B-B
SCALE 1 : 2

TYPICAL ON THE OTHER SIDE OF THE FLOOR SKID MOUNTING CHANNEL ITEM 21

UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW:
2 PL DEC ± 0.01
3 PL DEC ± 0.005
ANGLE ± 1.0

REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. CRITICAL CHARACTERISTIC

THIRD ANGLE PROJECTION

SolidWorks MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY

USP technologies

900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

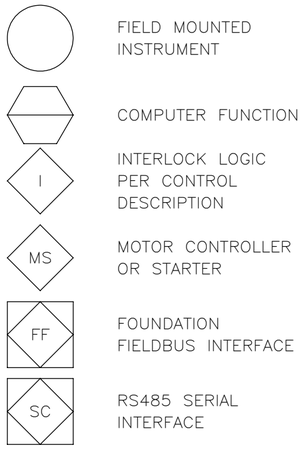
DESCRIPTION
SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

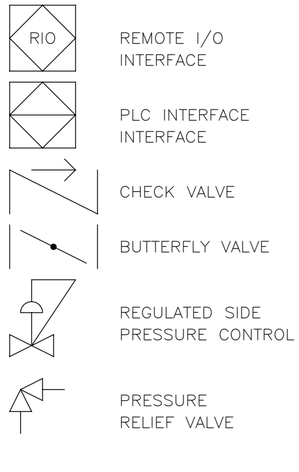
DRAWN BY	DWG NO.	REV
CREATED ON	1120_A	A
RELEASE LOG #	MASS: 109.38 lbs / SCALE: 1:5 / SHEET 5 OF 7 / SIZE C	

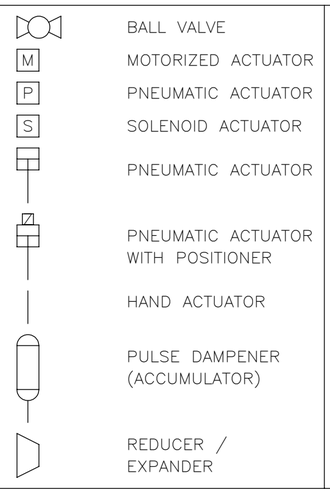
CURRENT STATUS: NOT VAULTED

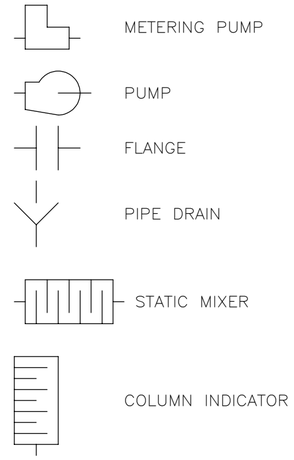
LEGEND

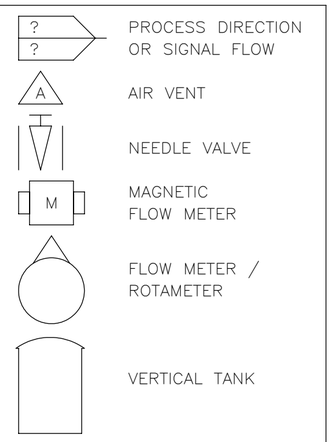
20–XXX →	PIPING SIZE (INCHES) – PROCESS FLOW DESIGNATION (ARROW INDICATES FLOW DIRECTION)
— I —	INSTRUMENTATION SIGNAL
— O —	PROCESS CONTROL SYSTEM DATA HIGHWAY (SOFTWARE OR CONTROL NETWORK)
— F —	FOUNDATION FIELDBUS
— S —	SERIAL NETWORK
———	DIGITAL SIGNAL
— A —	ANALOG SIGNAL











AAL	ANALYSIS ALARM LOW
AALL	ANALYSIS ALARM LOW LOW
AE	ANALYSIS ELEMENT
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATING TRANSMITTER
BV	BALL VALVE
CV	CHECK VALVE
D	DRAIN
DGS	DEGASSING VALVE
FAH	FLOW ALARM HIGH
FAL	FLOW ALARM LOW
FALL	FLOW ALARM LOW LOW
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROL
FIT	FLOW INDICATING TRANSMITTER
FSL	FLOW SWITCH LOW
FV	BUTTERFLY VALVE
HS	HAND SWITCH
IE	CURRENT ELEMENT
IAH	CURRENT ALARM HIGH
IAL	CURRENT ALARM LOW
JC	POWER LEVEL CONTROL
JIC	POWER LEVEL INDICATING CONTROL
LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
LE	LEVEL SWITCH ELEMENT
LI	LEVEL INDICATOR
LIT	LEVEL INDICATING TRANSMITTER
LR	OFF–LOCAL–REMOTE SWITCH FUNCTION
MS	MOTOR STATUS
NV	NEEDLE VALVE
OC	OPEN–CLOSE SWITCH FUNCTION
OR	ORIFICE
PDC	POWER DISTRIBUTION CENTER
PDI	PRESSURE DIFFERENTIAL INDICATOR / GAGE
PI	PRESSURE INDICATOR / GAGE
PMP	PUMP

PIT	PRESSURE INDICATING TRANSMITTER
RAL	UV INTENSITY ALARM LOW
RALL	UV INTENSITY ALARM LOW LOW
RE	UV INTENSITY ELEMENT
RI	UV INTENSITY INDICATOR
RIT	UV INDICATING TRANSMITTER
RT	UV TRANSMITTER
SCC	SYSTEM CONTROL CENTER
SMX	STATIC MIXER
SPC	SKID PACER CONTROL
TAH	TEMPERATURE ALARM HIGH
TAHH	TEMPERATURE ALARM HIGH HIGH
TAL	TEMPERATURE ALARM LOW
TALL	TEMPERATURE ALARM LOW LOW
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TIT	TEMPERATURE INDICATING TRANSMITTER
TSH	TEMPERATURE SWITCH HIGH
TSHH	TEMPERATURE SWITCH HIGH HIGH
TT	TEMPERATURE TRANSMITTER
TVN	TWO WAY VALVE NORMALY CLOSED
UVP	ULTRAVIOLET PROCESSED
UVC	ULTRAVIOLET CHAMBER
UVT	ULTRAVIOLET TRANSMITTANCE
UVU	ULTRAVIOLET UNPROCESSED
VIL	LAMP INDICATOR STATUS
VL	LAMP STATUS
XA	PUMP FAILURE ALARM
YC	CONTROL ENABLE
ZA	POSITION ALARM
ZC	POSITION CONTROLLER
ZI	POSITION INDICATION
ZIC	POSITION INDICATING CONTROLLER
ZLC	LIMIT SWITCH CLOSED
ZSC	POSITION SWITCH CLOSED
ZSO	POSITION SWITCH OPEN
ZT	POSITION TRANSMITTER

NOTES:

1/ NOT TO SCALE

UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW:
2 PL DEC ±
3 PL DEC ±
ANGLE ±

REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. CRITICAL CHARACTERISTIC

THIRD ANGLE PROJECTION

SolidWorks MAINTAINED DATA CHANGES SHALL BE INCORPORATED ELECTRONICALLY

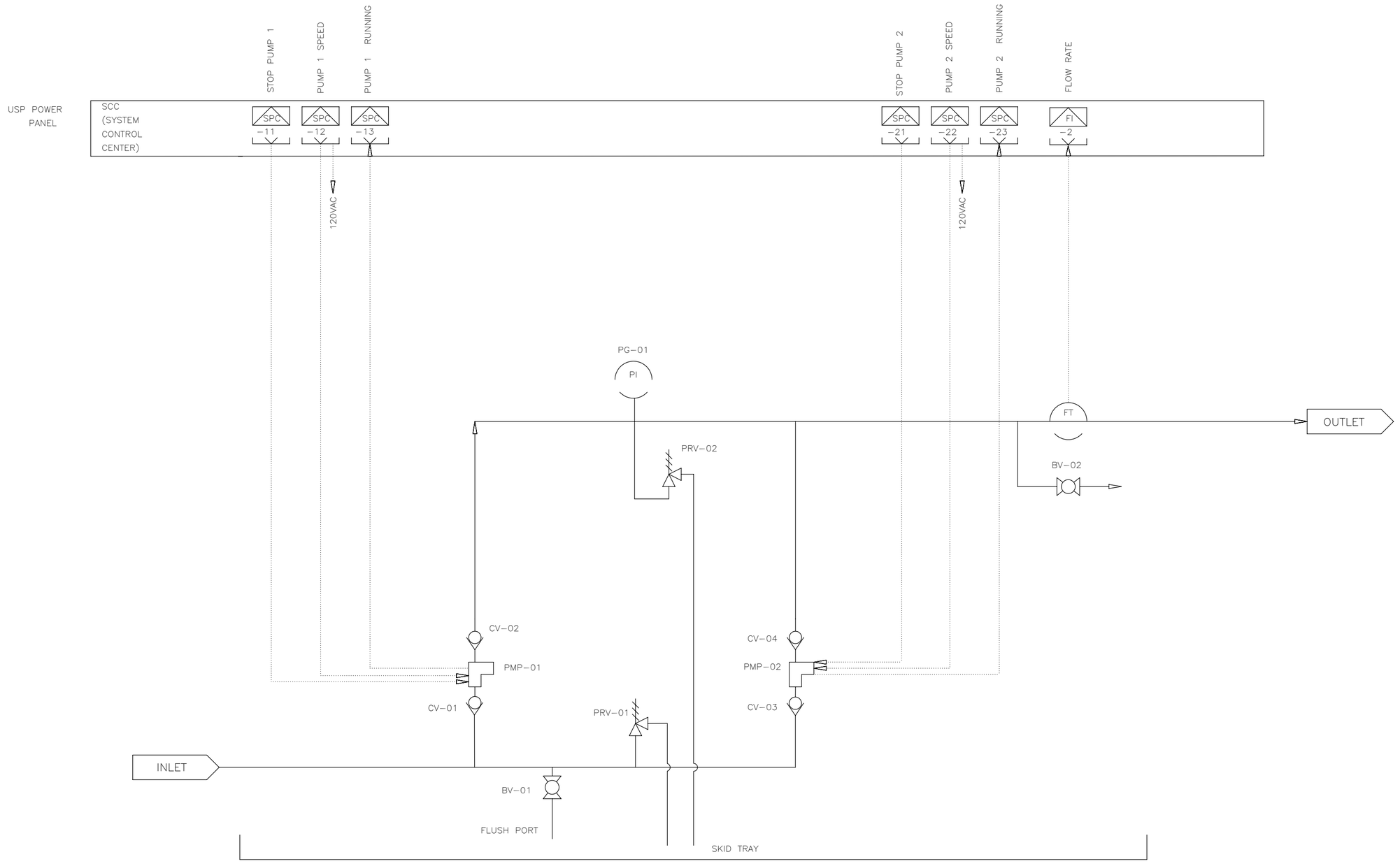
USP technologies

900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION: SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

DRAWN BY	DWG NO. 1120_A			REV A
CREATED ON				
RELEASE LOG #	MASS: lbs	SCALE: 1:5	SHEET 6 OF 7	SIZE C

CURRENT STATUS: NOT VAULTED



UNLESS OTHERWISE SPECIFIED:
DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-2009

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3 PL DEC ±
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REMOVE ALL BURRS, ALL CORNERS R 0.010" OR BREAK EDGE. ▷ CRITICAL CHARACTERISTIC

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900 CIRCLE 75 PARKWAY, SUITE 1330, ATLANTA, GA 30339

DESCRIPTION
SYSTEM, 1/2"SS 2P1D STEEL ENCLOSURE

DWG NO. 1120_A

REV A

MASS:TBD | SCALE: 1:10 | SHEET 7 OF 7 | SIZE C

CURRENT STATUS: NOT VAULTED

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

LEAD FREE*

Series LF909

Reduced Pressure Zone Assemblies

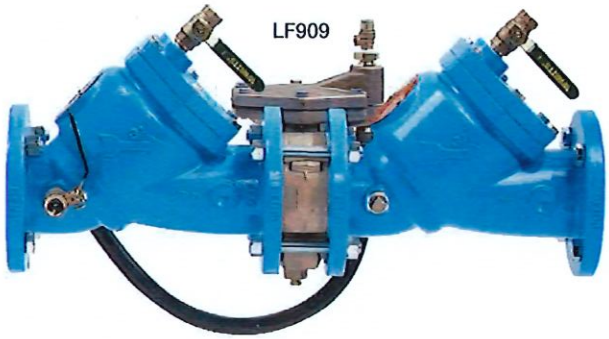
Sizes: 2½" – 10" (65–250mm)

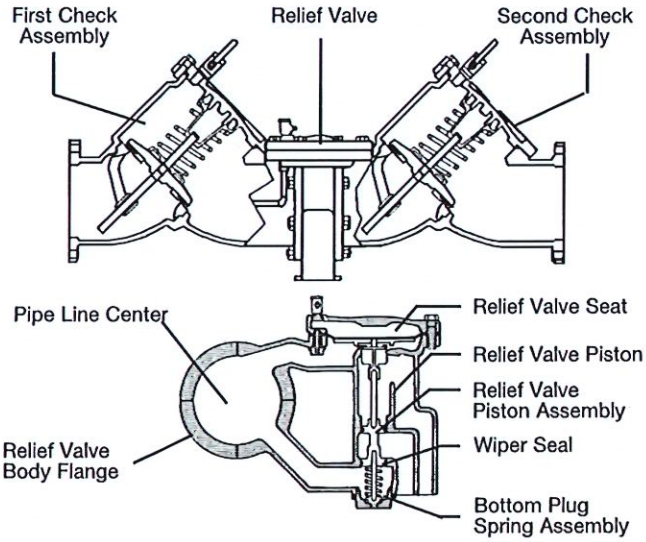
Series LF909 Reduced Pressure Zone Assemblies are designed to provide cross-connection control protection of the potable water supply in accordance with national plumbing codes. This series can be utilized in a variety of installations, including health hazard cross-connections in plumbing systems or for containment at the service line entrance. With its exclusive relief valve design incorporating the "air-in/water-out" principle, it provides substantially improved relief valve discharge performance during the emergency conditions of combined backsiphonage and backpressure with both checks fouled. The LF909 features Lead Free* construction to comply with Lead Free* installation requirements.

Series LF909 is also available with SentryPlus™ Alert technology to detect catastrophic relief valve discharge that could potentially cause flooding, and issue a multi-channel alert (call, e-mail, text) to selected users so they can take action to avoid potentially costly flooding.

Features

- Replaceable seats
- Stainless steel internal parts
- No special tools required for servicing
- Captured spring check assemblies
- Fused epoxy coated & lined checks
- Industrial strength sensing hose
- Field reversible relief valve
- Air-in/water-out relief valve design provides maximum capacity during emergency conditions





Now Available
WattsBox Insulated Enclosures.
For more information, send for literature ES-WB.

NOTICE
Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Available Models & Options

Suffix:

LF –	without shutoff valves
NRS –	non-rising stem resilient seated gate valves
OSY -	UL/FM outside stem & yoke resilient seated gate valves
QT-FDA –	FDA epoxy coated quarter-turn ball valves
S-FDA –	FDA epoxy coated strainer
ALERT	with SentryPlus™ Alert flood detection system

Note: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary.

WATTS®

Materials

Check Valve Bodies: FDA epoxy coated cast iron

Seats: Stainless steel

Trim: Stainless steel

Relief Valve Body: 2½"-3" (60-80mm) Lead Free* cast copper silicon alloy
4"-10" (100-250mm) FDA epoxy coated cast iron

Test Cocks: Lead Free* copper silicon alloy

Pressure — Temperature

Temperature Range: 33°F-110°F (0.5°C-43°C) continuous, 140°F (60°C) intermittent

Maximum Working Pressure: 175psi (12.06 bar)

Standards

AWWA C511-92

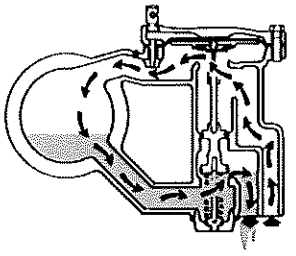
IAPMO PS 31, SBCCI (Standard Plumbing Code)

USC manual for Cross-Connection Control, 8th Edition

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

How It Operates

The unique relief valve construction incorporates two channels: one for air, one for water. When the relief valve opens, as in the accompanying air-in/water-out diagram, the right-hand channel admits air to the top of the reduced pressure zone, relieving the zone vacuum. The channel on the left then drains the zone to atmosphere. Therefore, if both check valves foul, and simultaneous negative supply and positive backpressure develops, the relief valve uses the air-in/water-out principle to stop potential backflow.



Approvals

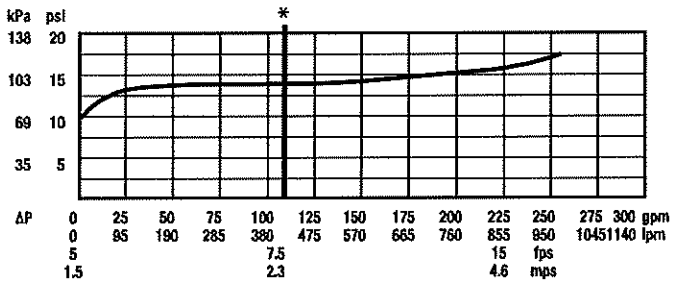
1013 B64.4

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

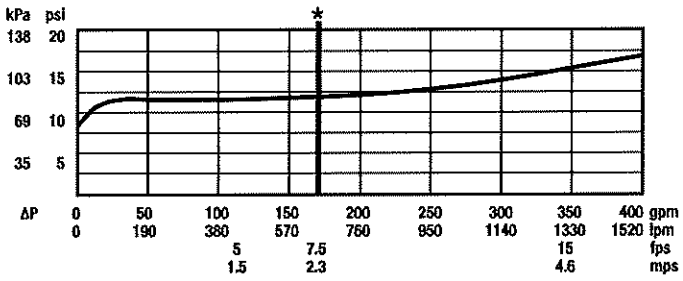
Capacity

*Typical maximum flow rate (7.5 feet/sec.)

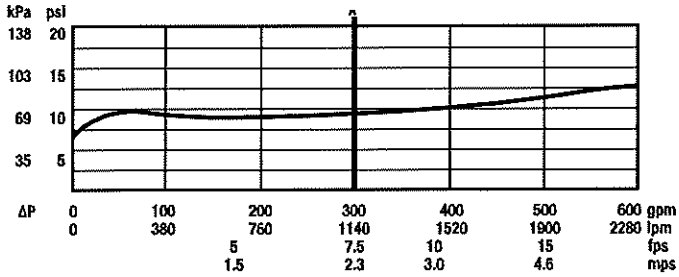
2½" (65mm)



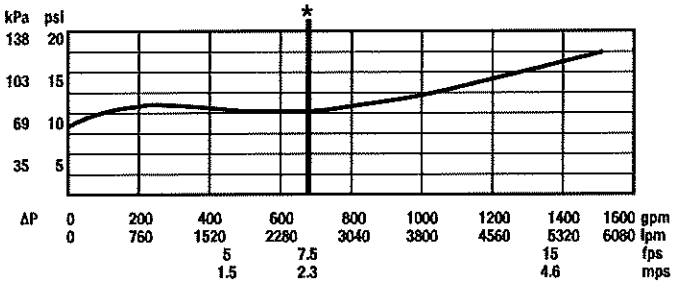
3" (80mm)



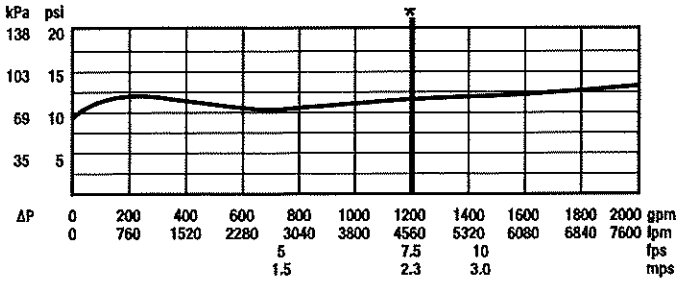
4" (100mm)



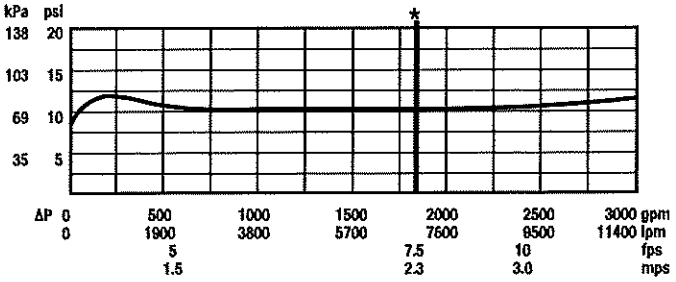
6" (150mm)



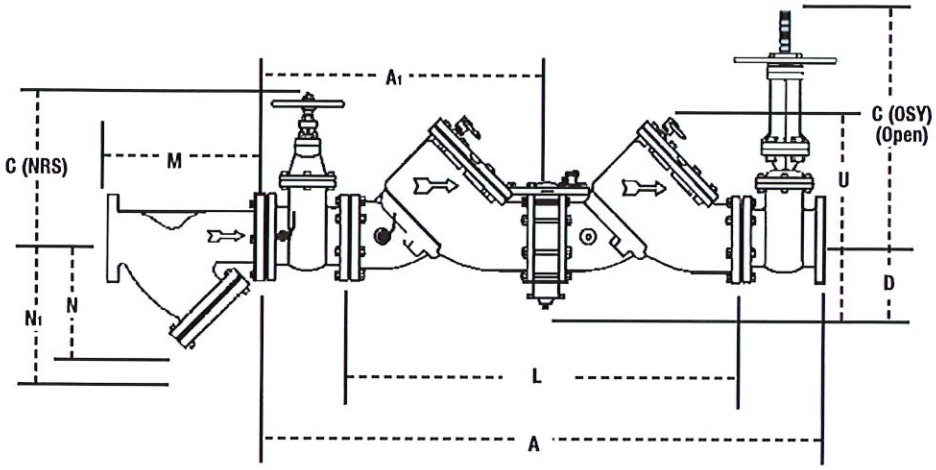
8" (200mm)

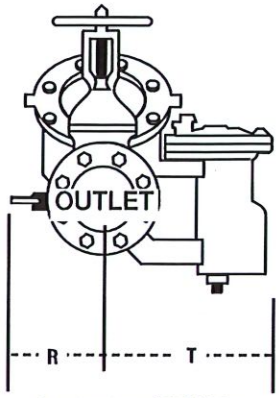


10" (250mm)

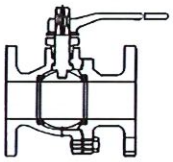


Dimensions — Weights





Quarter-turn (QT) Valve



Watts G-4000 Series
Ball Valves
Send for F-G4000

NOTE: Valve may be furnished with (2) OSY or (2) NRS Shutoffs.

NOTE: Relief valve section is reversible, therefore, can be on either side and is furnished standardly as shown.

SIZE (DN)		DIMENSIONS																WEIGHT					
						C clearance for check																	
		A		A1		(OSY)*		(NRS)		D		L		U		R		R (QT)		T		NRS		OSY		QT	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.	lbs.	kgs.	lbs.	kgs.
2½	65	41¼	1048	20⅝	524	16⅜	416	9⅜	238	5¼	133	26⅛	663	11	279	4	102	16	406	9 1/16	230	195	88.4	198	89.8	182	82.6
3	80	42¼	1073	21¼	540	18⅞	479	10¼	260	5¼	133	26⅛	663	11	279	5	127	16	406	9 1/16	230	225	102	230	104	190	86
4	100	55⅛	1400	27⅝	702	22¾	578	12 5/16	310	6	152	37	940	14	356	6	152	19¾	502	14⅜	365	455	206	470	213	352	160
6	150	65½	1664	32¾	832	30⅛	765	16	406	6	152	44½	1130	16	406	11	279	26	660	14⅜	365	718	326	798	362	762	346
8	200	78½	2000	39⅜	1000	37¾	959	19 15/16	506	9¾	248	55¼	1403	21	533	11¼	286	11¼	286	19¼	489	1350	612	1456	660	2286	1037
10	250	93⅝	2378	46⅞	1190	45¾	1162	23 13/16	605	9¾	248	67⅜	1711	21	533	12½	318	12½	318	21	533	2160	980	2230	1011	3716	1685

*UL, FM approved backflow preventers must include UL/FM approved OSY gate valves.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

Strainer Dimensions

SIZE (DN)		DIMENSIONS						WEIGHT	
		M		N1†		N			
in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
2½	65	10	254	10	254	6½	165	28	12.7
3	80	10⅛	257	10	254	7	178	34	15.4
4	100	12⅛	308	12	305	8¼	210	60	27
6	150	18½	470	20	508	13½	343	133	60
8	200	21⅝	549	22¾	578	15½	394	247	112
10	250	26	660	28	711	18½	470	370	168

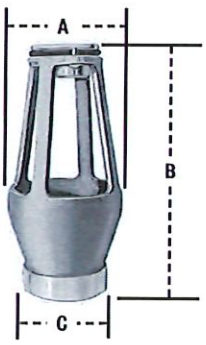
† – Dimension required for screen removal

Air Gap Dimensions

When installing a drain line on Series 909 backflow preventers that are installed horizontally, use 909 AG series air gaps.

IRON BODY MODEL NO.	ORDERING CODE	SERIES/SIZES	DIMENSIONS						WEIGHT	
			A		B		C			
			in.	mm	in.	mm	in.	mm	lbs	kgs
909AG-F	881378	1¼" – 3" 009/909 1¼" – 2" 009 M1 2" 009 M2	4⅜	111	6¾	171	2	51	3.25	1.47
909AG-K	881385	4" – 6" 909 8" – 10" 909 M1	6⅜	162	9⅝	244	3	76	6.25	2.83
909AG-M	881387	8" – 10" 909	7⅜	187	11¼	286	4	102	15.5	7.03

For flange size backflow preventers installed vertically (flow down), a fabricated air gap is recommended.



Specifications

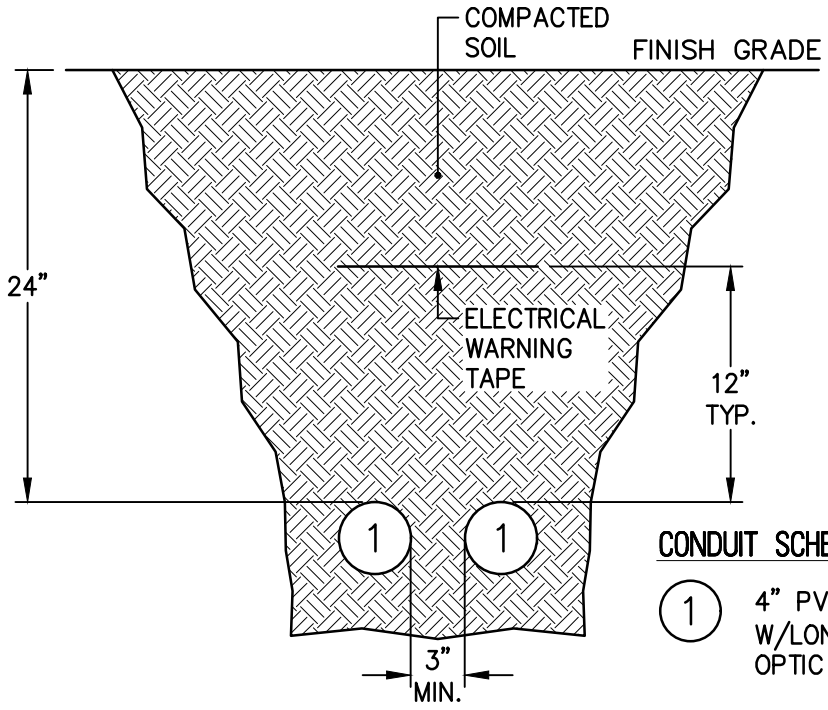
A Reduced Pressure Zone Assembly shall be installed at each cross-connection to prevent backsiphonage and backpressure backflow of hazardous materials into the potable water supply. The assembly shall consist of a pressure differential relief valve located in a zone between two positive seating check valves and captured springs. Backsiphonage protection shall include provision to admit air directly into the reduced pressure zone via a separate channel from the water discharge channel. The assembly shall include two tightly closing shutoff valves before and after the valve and test cocks. The Lead Free* Reduced Pressure Zone Assembly shall comply with state codes and standards, where applicable, requiring reduced lead content. The assembly shall meet the requirements of ASSE Std. 1013; AWWA Std. C511-92; CSA B64.5; and UL Classified File No. EX3185. Listed by IAPMO (UPC). Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. The assembly shall be a Watts Series LF909.

For additional information, visit our web site at: Watts.com

USA: Tel: (978) 689-6066 • Fax: (978) 975-8350 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Watts.com

ES-LF909L 1910

DRAWING



CONDUIT SCHEDULE:

1	4" PVC SCHEDULE 40 CONDUIT W/LONG RADIUS ELBOWS FOR FIBER OPTIC CABLE. PROVIDE PULL CORD.

11 DUCT BANK DETAIL X-X

N.T.S.

NO.	REVISION	DATE	BY	CHK. BY
1	DEVICES ADDED PER FIRE SUB-CODE OFFICIAL	4/25	K.M.	

REMINGTON & VERNICK ENGINEERS
24 GA 28003800
2059 SPRINGDALE ROAD, CHERRY HILL N.J. 08003
(856) 795-9595, FAX (856) 795-1882, WEB SITE ADDRESS: WWW.RVE.COM

SCALE	DATE	DRAWN BY	DSGN. BY	CHK'D. BY	DWG. NO.	SHEET NO.
NTS	4/3/2025	R.D.	K.M.		ESK-1	E-6.2

DWG FILE PATH/NAME
P:\Projects\Camden County\0424M081\Sheets\E-6.2 Electrical Details