

RECEIVED

JUN 20 2017

PUBLIC SERVICE  
COMMISSION

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

THE APPLICATION OF SOUTH HOPKINS )  
WATER DISTRICT TO INCUR )  
INDEBTEDNESS OF \$765,000.00 FOR THE )  
REHABILITATION OF TWO (2) WATER )  
TANKS AND FOR A CERTIFICATE OF )  
CONVENIENCE AND PUBLIC )  
NECESSITY )

CASE NO. 2017-00237

RESPONSE TO DEFICIENCY LETTER AND MOTION TO HOLD IN  
ABEYANCE

The applicant, **SOUTH HOPKINS WATER DISTRICT** (the “District”), files this response to the deficiency letter of June 15, 2017, and moves the Commission to hold the application in abeyance pending a response from the Division of Water.

Applicant submits as follows:

1. 807 KAR 5:001: Section 18(1)(g): attached hereto is the District’s notice to the State Local Debt Officer at the Department of Local Government. A follow up letter was mailed to the Commissioner of the Department of Local Government per that Department’s directive. Both are attached.
2. 807 KAR 5:001: Section 15(2)(b)- the District has no franchise agreements. Although no permit is necessary for tank maintenance, a

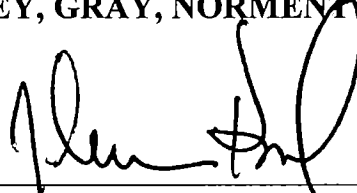
DW-1 form will be submitted to the Division for Water for the installation of a mixing system.

3. 807 KAR 5:001 – Section 15(2)(d)(2) – the plans and specifications for the cleaning and painting of the elevated tank are attached as Exhibit B. The plans and specifications for the cleaning and painting of the ground tank are attached as Exhibit C. There are no drawings for Exhibits B and C. The drawing, plans and specifications for the installation of the mixing system in the ground tank are attached as Exhibit D.
4. KRS 322.340 - The only drawing attached was supplied by the vendor for the mixing system. Applicant is in contact with its consultant, Jay Hoffman of Wet or Dry Inspection Services in Campbellsburg, Kentucky to determine compliance with this item.

WHEREFORE, Applicant submits the foregoing information and requests that the Application be held in abeyance pending approval from the Division of Water and compliance with Deficiency Item 4.

**DORSEY, GRAY, NORMENT & HOPGOOD**

By



J. Christopher Hopgood

318 Second Street

Henderson, KY 42420

Telephone: (270) 826-3965

Telefax: (270) 826-6672

Counsel for South Hopkins Water District

[chopgood@dkgnlaw.com](mailto:chopgood@dkgnlaw.com)

**DEFICIENCY ITEM 1**

DORSEY, GRAY, NORMENT & HOPGOOD

ATTORNEYS-AT-LAW

318 SECOND STREET

HENDERSON, KENTUCKY 42420

JOHN DORSEY (1920-1986)  
STEPHEN D. GRAY  
WILLIAM B. NORMENT, JR.  
J. CHRISTOPHER HOPGOOD  
S. MADISON GRAY  
DAVIS L. HUNTER

TELEPHONE  
(270) 826-3965  
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[www.dkgnlaw.com](http://www.dkgnlaw.com)

June 15, 2017

Department of Local Government  
Mr. Jodie Williams  
1024 Capital Center Drive  
Suite 340  
Frankfort, KY 40601

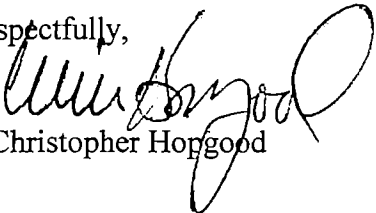
Re South Hopkins Water District

Dear Ms. Williams:

I understand you are the State Local Debt Officer for the South Hopkins Water District. Please be advised that the South Hopkins Water District has been approved for a KIA loan in the amount of \$765,000 to rehabilitate two water tanks. I have filed an Application for Certificate of Convenience and Public Necessity with the Public Service Commission.

This letter is written notice to you that we are seeking approval for the financing with KIA and a certificate of public convenience and necessity for the water tank rehabilitation. The application with the attached loan approval is on file with the Public Service Commission, Case Number 2017-00237. If you would like a hard copy or if you need other information, please advise.

Respectfully,

  
J. Christopher Hopgood

DORSEY, GRAY, NORMENT & HOPGOOD

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June 19, 2017

Department of Local Government  
Commissioner Sandra K. Dunahoo  
1024 Capital Center Drive  
Suite 340  
Frankfort, KY 40601

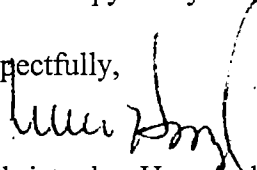
Re South Hopkins Water District

Dear Commissioner Dunahoo:

I have been directed to contact you as the State Local Debt Officer for the South Hopkins Water District. This letter supplements the letter of June 15, 2017, mailed by my office to Jodie Williams of your office. Please be advised that the South Hopkins Water District has been approved for a KIA loan in the amount of \$765,000 to rehabilitate two water tanks. I have filed an Application for Certificate of Convenience and Public Necessity with the Public Service Commission.

This letter is written notice to you that we are seeking approval for the financing with KIA and a certificate of public convenience and necessity for the water tank rehabilitation. The application with the attached loan approval is on file with the Public Service Commission, Case Number 2017-00237. If you would like a hard copy or if you need other information, please advise.

Respectfully,



J. Christopher Hopgood

**DEFICIENCY ITEM 3**

**Contractor shall provide a holiday free coating system.**

All roof rafters, beams, supports, sidewall connections that have not been seal welded shall be sealed with a NSF-61 approved caulking material. So as to create a smooth unbroken area that cannot be accessed by moisture. All of these areas shall be sealed following the application of the finish coat. Once it has cured to a point that it can withstand traffic without causing damage.

**Tank Exterior:**

100% of the tank exterior shall be abrasive blasted to an SSPC-SP10

**a. Rust-Oleum Industrial**

Primer Rust-Oleum 9380 to a DFT of 3-5 mils  
Gray  
Intermediate Rust-Oleum 9370 to a DFT of 3-5 mils  
Buff  
Finish Rust-Oleum 9400 to a DFT of 2-3 mils  
Teardrop  
DFT shall not be less than 10 mils

**b. Tnemec Co**

Primer Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.  
Red  
Intermediate Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.  
Beige  
Finish Tnemec Series 73/ High Gloss to a D.F.T. of 3.0-5.0 mils.  
Teardrop  
DFT of the exterior 9 mils

Exterior color OWNER will determine them. The DFT specified shall be obtained additional coats shall be applied at the contractors expense, to achieve the specified DFT

00013-3A

**Cleaning & Painting 150,000 Elevated Tank**  
**Complete Rehab & Riser Replacement**  
**Hwy 98**  
**Containment/Lead abatement**

Historical overview of the structure:

The tank was built 1968 by Universal manufacture and is approximately 97 ' with a head range of 28' During initial construction the tank interior was coated with wax/grease, by an unknown contractor. The exterior coating is lead containing

It shall be the contractors responsibility to determine the most appropriate means for applying coatings to the exterior and interior of the tank (with exception of the specified roll coat to all interior welds). If tank surfaces are rolled, roller nap inclusions in the coating shall not be allowed. All roller nap and other foreign objects shall be removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. Any and all touched up areas shall color match exactly to the surrounding coatings.

Any and all runs, drips, sags, curtains, etc shall be brushed out during application or removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. Any and all touched up areas shall color match exactly to the surrounding coatings.

- Install new cable, float, indicator board, piping...as needed
- New frost free roof vent
- Tank shall be contained and all coatings removed and replaced
- Replace sign as is
- Grout around base of riser:

Grout shall non-shrink type, mixed according to manufactures directions, applied and struck off even.

**Tank Interior:**

The tank interior coating shall be blasted to an SSPC-SP 10 in all damaged areas from containment, with the remainder blasted to an SSPC-SP 7

The interior of the tank shall be abrasive blasted to an SSPC-10 Near-White Metal:

a. Rust-Oleum Industrial

Primer Rust-Oleum W 9200 Primer to a DFT of 5.0-8.0 Mils  
Marlin Blue

Finish Rust-Oleum W 9293 Finish to a DFT 5.0-8.0 Mils  
White

All weld seams shall receive an additional roll coat to a DFT of 5.0-8.0 Mils  
**Prior to finish application**

Total DFT shall not be less than 10 Mils not including the weld seams which shall be a minimum of 5 mils greater.

00013-1B

b. Tnemec Co.

Primer Tnemec Series 20-1255 to a DFT of 5.0-8.0 mils  
Belge

Finish Tnemec Series 20-1255 to a DFT of 5.0-8.0 mils  
White

All weld seams shall receive an additional roll coat to a DFT of 5.0 mils  
**Prior to finish application Red**

Total DFT shall not be less than 10 Mils not including the weld seams which shall be a minimum of 5 mils greater.

**The roll coat is to be applied prior to the application of the finish coat. A minimum of one full day (24 hours) shall pass prior to the application of the finish coat.**

**Contractor shall provide a holiday free coating system.**

All roof rafters, beams, supports, sidewall connections that have not been seal welded shall be sealed with a NSF-61 approved caulking material. So as to create a smooth



unbroken area that cannot be accessed by moisture. All of these areas shall be sealed following the application of the finish coat. Once it has cured to a point that it can withstand traffic without causing damage.

**Tank Exterior:**

100% of the tank exterior shall be abrasive blasted to an SSPC-SP10

a. Rust-Oleum Industrial

Primer Rust-Oleum 9380 to a DFT of 3-5 mils

**Gray**

Intermediate Rust-Oleum 9370 to a DFT of 3-5 mils

**Buff**

Finish Rust-Oleum 9400 to a DFT of 2-3 mils

**Teardrop**

DFT shall not be less than 10 mils

b. Tnemec Co

Primer Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

**Red**

Intermediate Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

**Beige**

Finish Tnemec Series 73/ High Gloss to a D.F.T. of 3.0-5.0 mils.

**Teardrop**

DFT of the exterior 9 mils

Exterior color OWNER will determine them. The DFT specified shall be obtained additional coats shall be applied at the contractors expense, to achieve the specified DFT

00013-2B

**Cleaning & Painting 150,000 Ground Tank**

**Complete Rehab**

**Hwy 62**

**Containment/Lead abatement**

The tank was built 1968 by Universal manufacture and is approximately 24 ' During initial construction the tank interior was coated with wax/grease, by an unknown contractor. The exterior coating is lead containing

It shall be the contractors responsibility to determine the most appropriate means for applying coatings to the exterior and interior of the tank (with exception of the specified roll coat to all interior welds). If tank surfaces are rolled, roller nap inclusions in the coating shall not be allowed. All roller nap and other foreign objects shall be removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. Any and all touched up areas shall color match exactly to the surrounding coatings.

Any and all runs, drips, sags, curtains, etc shall be brushed out during application or removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. Any and all touched up areas shall color match exactly to the surrounding coatings.

- Install new cable, float, indicator board, piping...as needed

- New frost free roof vent
- Tank shall be contained and all coatings removed and replaced
- Replace sign as is
- Grout around base of riser:

Grout shall non-shrink type, mixed according to manufactures directions, applied and struck off even.

**Tank Interior: All Grease shall be removed and steel degreased prior to beginning blasting. Hot water high pressure washer and degreaser(submit product for review)**

6. The interior of the tank shall be prepared in accordance with AWWA D102-97. The interior shall be solid abrasive blasted, and shall be abrasive blasted with a low silica (0.1%) low dust containing material in accordance with SSPC- SP 10 "Near White Metal Blast Cleaning". Once the surface has been prepared, all weld seams shall be investigated. Any welds found to be deficient or that could result in structural failure, or any pits discovered as a result of surface preparation. Shall be rewelded (followed by grinding of repair to create a flush, consistent surface with the existing steel), pits shall be welded if greater than one half the thickness of the steel wall.

All roof seams that are not seal welded shall be sealed with an approved material that has the elongation factors to compensate for thermal contraction and expansion as weather changes. Backer rod may be utilized in areas larger than 1/4" then filled with material to create a clean continuous seam.

7. 2. As blast cleaning proceeds, it may become necessary to fill some of the deeper pits in the roof, shell, and floor plates as well as angles behind the compression rings and elsewhere as determined by inspector. Pits found one third to two thirds the thickness of the steel shall be filled with a material approved by the Consultant

00013-1C

8. prior to application the filler shall be applied to blast cleaned surfaces and shall be DEVCON plastic steel Mfg. number 10110. Filling shall be neatly trowled into pits and voids and smoothly finished flush with the adjacent surfaces. Painting over of these areas will not be allowed until this material has fully cured. Welding new 1/4 steel plate over the pit may also repair pits. All plate welding shall be seal welded and ground smooth to create a transition between the plate and the existing steel surface.

The interior of the tank shall be abrasive blasted to an SSPC-10 Near-White Metal:

a. Rust-Oleum Industrial

Primer Rust-Oleum W 9200 Primer to a DFT of 5.0-8.0 Mils

Marlin Blue

Finish Rust-Oleum W 9293 Finish to a DFT 5.0-8.0 Mils

White

All weld seams shall receive an additional roll coat to a DFT of 5.0-8.0 Mils

**Prior to finish application**

Total DFT shall not be less than 10 Mils not including the weld seams which shall be a minimum of 5 mils greater.

b. Tnemec Co.

Primer Tnemec Series 20HS to a DFT of 5.0-8.0 mils

\_\_\_\_\_ **Beige**  
Finish \_\_\_\_\_ Tnemec Series 20HS to a DFT of 5.0-8.0 mils  
\_\_\_\_\_ **White**

\_\_\_\_\_ All weld seams shall receive an additional roll coat to a DFT of 5.0 mils

\_\_\_\_\_ **Prior to finish application** \_\_\_\_\_ **Red**

\_\_\_\_\_ *Total DFT shall not be less than 10 Mils not including the weld seams which shall be a minimum of 5 mils greater.*

\_\_\_\_\_ **The roll coat is to be applied prior to the application of the finish coat. A minimum of one full day (24 hours) shall pass prior to the application of the finish coat.**

\_\_\_\_\_ **Contractor shall provide a holiday free coating system.**

\_\_\_\_\_ All roof rafters, beams, supports, sidewall connections that have not been seal welded shall be sealed with a NSF-61 approved caulking material. So as to create a smooth unbroken area that cannot be accessed by moisture. All of these areas shall be sealed following the application of the finish coat. Once it has cured to a point that it can withstand traffic without causing damage.

\_\_\_\_\_ **Tank Exterior:**

\_\_\_\_\_ 100% of the tank exterior shall be abrasive blasted to an SSPC-SP10

\_\_\_\_\_ a. Rust-Oleum Industrial

\_\_\_\_\_ Primer \_\_\_\_\_ Rust-Oleum 9380 to a DFT of 3-5 mils

\_\_\_\_\_ **Gray**

\_\_\_\_\_ Intermediate \_\_\_\_\_ Rust-Oleum 9370 to a DFT of 3-5 mils

\_\_\_\_\_ **Buff**

\_\_\_\_\_ Finish \_\_\_\_\_ Rust-Oleum 9400 to a DFT of 2-3 mils

\_\_\_\_\_ **Teardrop**

\_\_\_\_\_ DFT shall not be less than 10 mils \_\_\_\_\_

\_\_\_\_\_ 00013-2C \_\_\_\_\_

\_\_\_\_\_ b. Tnemec Co

\_\_\_\_\_ Primer \_\_\_\_\_ Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

\_\_\_\_\_ **Red**

\_\_\_\_\_ Intermediate \_\_\_\_\_ Tnemec Series 69 to a D.F.T. of 3.0-5.0 mils.

\_\_\_\_\_ **Beige**

\_\_\_\_\_ Finish \_\_\_\_\_ Tnemec Series 73/ High Gloss to a D.F.T. of 3.0-5.0 mils.

\_\_\_\_\_ **Teardrop**

\_\_\_\_\_ DFT of the exterior 9 mils \_\_\_\_\_

\_\_\_\_\_ Exterior color OWNER will determine them. The DFT specified shall be obtained additional coats shall be applied at the contractors expense, to achieve the specified DFT

00013-3C

**Surface Preparation**

1.1 a. In all cases, surfaces shall be primed and or treated, as specified the same day they are prepared. A prepared surface, which becomes corroded or contaminated, shall be re-prepared before painting at no additional cost to the OWNER.

b. Dust from cleaning operations shall be properly removed by dry methods such as vacuuming or dry air blast, while not reducing the quality of the cleaned surface.

c. CONTRACTOR shall have on the job at all times at least one (1) copy of the latest SSPC pictorial standards, which shall be followed.

d. For ferrous metals, surface preparation shall consist of on or more of the methods contained in the methods supplied.

e. Abrasives utilized for blasting operations shall contain less than 0.01% free silica during and following blasting operations. Contractor is responsible for all cleanup and removal of blasting media following operations, as well as total removal from Owners' site. Media shall be profiled and documentation submitted to Consultant prior to media leaving site.

f. Abrasive shall be of the correct size to create the desired profile from the coatings manufactures data sheet.

**Equipment and Procedures**

1.2 a. At least 10 days prior to commencing field painting, the CONTRACTOR shall submit to CONSULTANT for review and acceptance a list of major items of equipment and procedures he proposes for painting.

b. The CONTRACTORS procedure for painting shall include the chronological sequence of operations.

c. Equipment list shall include make and capacity of compressor, make and capacity of abrasive blasting and spraying equipment.

d. Compressor shall be capable of delivering a minimum of 100 psi at the nozzle, at maximum working height of tank during blasting operations.

e. Effective oil and water separators, and a air drier shall be used in all lines serving spray painting and abrasive blasting operations to remove oil and moisture from the compressed air.

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00013-4

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**Mixing of Coatings:**

1.3. Owner shall designate an area where all coatings shall be stored and mixed only. All mixing shall be done over a double tarped area. Any and all spills shall be reported to the Owner immediately at the time of incidence. Contractor shall bear responsibility, as well as all costs associated with cleanup and removal of any contaminated area (s).

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**1.1 Painting**

a. Skilled, experienced painters on properly prepared surfaces shall do all painting. All surfaces, which are not to be coated, shall be protected.

b. The CONTRACTOR shall be responsible for the compatibility of all paints used in work.

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**2.2 Ventilation**

a. Ventilation is essential to remove vapors during application and curing of coatings.

b. Ventilation shall be exhausted from lowest portion of tank with top openings kept clear.

c. During coating applications the capacity of the ventilating fans shall be at least 400 cfm per gallon of coating applied per hour.

d. The ventilation requirements are to ensure proper curing of the applied coatings and are not to be taken as requirements to insure worker safety.

e. Following the application of the final interior coating the tank shall be force ventilated by mechanical means from the lowest possible point for a minimum of 48 hours, ventilation shall be such that it creates a total turn over on the interior of the tank a least once per hour.

### 2.3 Quality Assurance

A. Manufacture: Provide products manufactured by the following:

1. Rust-Oleum Industrial Mark Sholtes 502-451-2226
2. Tnemec Jerry Petro 877-348-8427

Alternate products may be considered, Contractor shall submit in writing detailed explanation for requesting product change, along with pricing of product. If product is accepted any and all savings shall revert back to owner. Contractor shall bear any and all costs associated with evaluation of product by consultant, which may include but not limited too research, and testing by independent laboratories for product performance, and equality of those specified

Only approved thinners from coatings manufacture shall be used at all times. Any and all spills shall be reported to the Owner immediately at the time of incidence. Contractor shall bear responsibility, as well as all costs associated with cleanup and removal of any contaminated area (s).

00013-5

### B. Applicator Qualifications

1. All coatings related work shall be performed only by competent blasters and painters. If workmen exhibit lack of experience they may not be allowed to work on project. Consultant has final determination on workmen & foreman assigned to project

### C. Reference Standards:

1. SSPC or NACE surface preparation standards shall be on-site clearly visible to all workmen.
2. A copy of project specifications shall be on job site at all times for workmen.

### 2.5 Submittals:

Copy of manufactures technical information for coatings used on project. Shipping list with batch numbers for all coatings and thinners as well as shelf life delivered to site. MSDS sheets for all products on site shall be on site at all times.

### 2.6 Product Delivery, Storage and Handling:

A. Deliver all materials to job site in original, new and unopened containers. Bearing the manufactures name and label.

1. Name of material
2. Manufactures Stock number and date of manufacture
3. Manufactures name
4. Contents by volume

5. thinning instructions
6. Application instructions
7. Color name and number

**B. Storage of materials:**

8. Store only acceptable project materials on project site
9. Store according to manufactures recommendation
10. Comply with all State and Federal health and fire hazard regulations.
11. MSDS sheets shall be in a bound set on job-site at all times, available to emergency personnel if required.

**2.7 Environmental Requirements for application of coatings:**

12. Apply paints only when temperature of surfaces to be painted and surrounding air temps are between 55 and 90 degrees Fahrenheit unless otherwise permitted by paint manufactures printed instructions.
13. Application of coatings will not be permitted in snow, rain, fog, mist or when the relative humidity exceeds 85%; or when the surface temp of substrate is less than 5 degrees Fahrenheit above the dew point; or to damp or wet surfaces.
14. Painting will not be allowed during periods of inclement weather.

00013-6

15. The CONTRACTOR at all times shall provide adequate illumination in areas where painting operations are in progress. **Lighting shall be OSHA approved and explosion proof.**

**3.1 Disinfection:**

After curing at least the minimum number of days required by the paint manufacture, the CONTRACTOR shall wash the Head tank interior with an adequate volume of water to thoroughly wet all the interior surfaces including those above the high water level. All water will be removed and disposed of in accordance with approved regulations.

1. It is the CONTRACTORS responsibility after washing and curing to completely disinfect the interior portion of the tank, AWWA C652 Method 2 ONLY. . If acceptable to KY Division of Water, If not acceptable then method 1 or 3 shall be used at no additional expense to owner. The Owner shall take and send water samples to the laboratory, but shall assume no responsibility for the sampling technique or the care of the samples. The stored tank water shall comply with Current STATE, USEPA, and AWWA standards for organic, inorganic, and biological contaminants as influenced by the operations of the CONTRACTOR.

**3.2 Warranty:**

CONTRACTOR shall provide a two-(2) year minimum warranty on all aspects of work performed on project. A Third Party firm designated by the owner shall conduct warranty inspection prior to end of warranty. Any deficiencies shall be corrected at no cost to the owner; all costs for repair shall be incurred by the contractor and shall include the use of outside inspection personnel to verify to owner that repair work has been completed as needed. The owner shall hold at their discretion a 5 % retainage until after the warranty inspection and any repair work has been completed. If warranty has not been completed or is not performed the OWNER following the warranty period shall pay the 5 % retainage to contractor. Retainage shall not bear any interest for the time period.



Tideflex Technologies  
 600 North Bell Avenue  
 Carnegie, PA 15106-0548 USA

ANALYSIS BY: Michael Duer, P.E.

**TIDEFLEX MIXING SYSTEMS (TMS)**

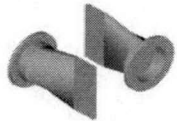
Reservoir Name: 0.15MG Standpipe  
 Reservoir Dimensions: 26' Dia. x 37.7'  
 Reservoir Capacity: 0.15 MG  
 End User: South Hopkins W.D., KY  
 Contact: Jon Blalock  
 Consultant: Wet or Dry  
 Contact: Jay Hoffman  
 Red Valve Rep: Wascon  
 Contact: Josh Cravins

**PRELIMINARY  
 TMS  
 DIMENSIONS**

Diameter: 26 ft  
 Depth to Overflow: 37.7 ft  
 Depth to HWL (Water Depth): 37 ft  
 Depth to LWL: 33.22 ft  
 Floor Penetration off Side Wall: 1 ft (ASSUMED)

Projected Volume 0.15 MG

INLET PIPE SIZE 6 in  
 OUTLET PIPE SIZE 6 in  
 Common (COM) or Separate (SEP) COM  
 TMS MANIFOLD SIZE 6 in



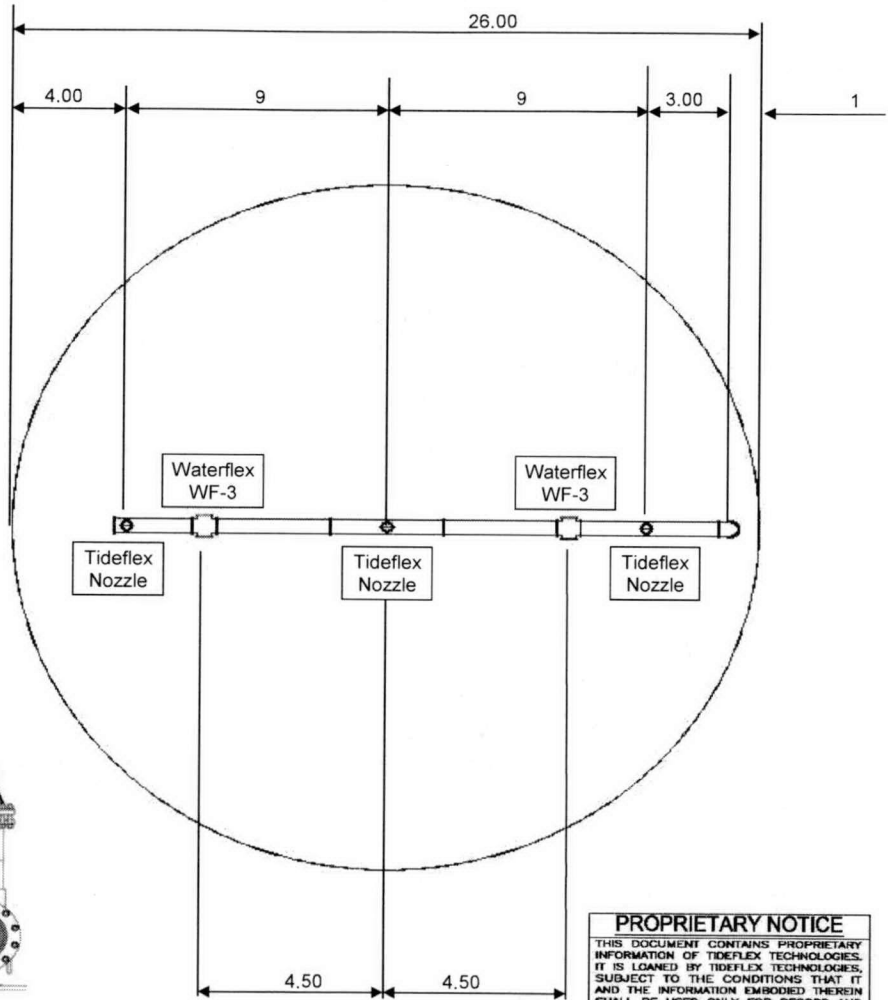
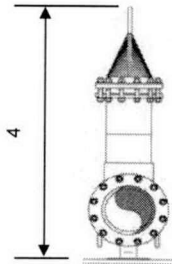
**TIDEFLEX INLET NOZZLES**

Quantity 3  
 Size 4 inch  
 Hydraulic Code 51  
 Elevation Above Floor 4 ft



**WATERFLEX OUTLET VALVES**

Quantity 2  
 Size 6 inch



**PROPRIETARY NOTICE**  
 THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF TIDEFLEX TECHNOLOGIES. IT IS LOANED BY TIDEFLEX TECHNOLOGIES, SUBJECT TO THE CONDITIONS THAT IT AND THE INFORMATION EMBODIED THEREIN SHALL BE USED ONLY FOR RECORD AND REFERENCE PURPOSES. IT SHALL NOT BE USED OR CAUSED TO BE USED IN ANY WAY PREJUDICIAL TO THE INTERESTS OF TIDEFLEX TECHNOLOGIES. IT SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART, OR DISCLOSED TO ANYONE WITHOUT THE DIRECT WRITTEN PERMISSION OF TIDEFLEX TECHNOLOGIES AND SHALL BE RETURNED UPON REQUEST.



Coatings used:

\_\_\_\_\_  
\_\_\_\_\_  
Interior:

\_\_\_\_\_  
\_\_\_\_\_  
Exterior:

Prep:

\_\_\_\_\_  
Interior: SSPC-SP XXXXXX

\_\_\_\_\_  
\_\_\_\_\_  
Exterior: SSPC-SP XXXXXX

00017-2

Section 16  
RED VALVE MIXING SYSTEM

All accessories for the Hydrodynamic Mixing system with the exception of the Duckbill Valves may be supplied by the contractor. All items must be submitted to consultant for review. It is the intent that steel piping shall be used for this project

00016-1

General

The specifications in this section include components of the Reservoir Hydrodynamic Mixing System with the exception of the individual Variable Orifice Duckbill Check Valves.

- 11269.1 Series TF-2 Tideflex Check
- 11269.2 Series TF-1 Tideflex Check Valve
- 11269.3 Series 35 Tideflex Check Valve
- 11269.4 Series 351 Tideflex Check Valve
- 11269.5 Series 37 Tideflex Check Valve
- 11269.6 Series 37G Tideflex Check Valve
- 11269.7 Series 39 Tideflex Check Valve
- 11269.8 Series WF-3 Waterflex Check Valve

The Hydrodynamic Mixing System Valves shall be supplied by the Duckbill Check Valve Manufacturer. Approved manufacturer is Red Valve Company, Inc.

Referenced Standards

American National Standards Institute (ANSI)  
B16.1 – Cast Iron Pipe Flanges and Flanged Fittings

B16.5 – Pipe Flanges and Flanged Fittings  
B36.10 – American National Standard Weights and Dimensions of Welded and Seamless Wrought Steel Pipe

American Society for Testing and Materials (ASTM)

A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

A234 – Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

A351 – Standard Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts

A536 – Standard Specification for Ductile Iron Castings

C110 – Ductile Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water

D1330 – Standard Specification for Rubber-Sheet Gaskets

D1784 – PVC/CPVC Pipe Compounds

D1785 – PVC Pipe, Schedules 40, 80 & 120

D2466 – PVC Solvent Cement

D2855 – PVC Solvent Joints

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D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Fittings

D3915 – PVC Pipe Fitting Compounds

**American Iron and Steel Institute (AISI)**

AISI 304 – 304 Stainless Steel Plate

AISI 316 – 316 Stainless Steel Plate

AISI 1040 – Carbon Steel Plate

American Water Works Association (AWWA)

C110 – Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water

C200 - AWWA Standard for Steel Water Pipe 6" and Larger

C207 – Standard for Steel Pipe Flanges for Waterworks Service – Size 4 In. to 144 In.

C220 – AWWA Standard for Stainless Steel Pipe, 4" and Larger

C900 – AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In. for Water Distribution

C905 – AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In Through 48 In. for Water Transmission and Distribution

C906 – AWWA Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 In Through 63 In. for Water Distribution

National Sanitation Foundation (NSF)  
NSF Standard 14 – Plastic Piping System Components and Related Materials  
NSF Standard 61 – Drinking Water System Components – Health Effects

Polyvinyl Chloride (PVC) Pipe and Fittings

All PVC pipe and PVC fittings shall be a minimum schedule 40.

PVC pipe and fittings shall conform to AWWA C900/C905 and be NSF61 approved for potable water.

PVC pipe compounds shall be in accordance with the standards listed in the section Referenced Standards.

PVC solvent and solvent joints shall be in accordance with the standards listed in section Referenced Standards.

Field solvent welding will not be allowed unless approved by the Consultant

All pipe joints that are to be field connected shall be PVC Van Stone type flanges. Flange drilling to be in accordance with ANSI B16.1/B16.5.

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All fittings shall have the same pressure rating as the pipe unless otherwise noted.

High Density Polyethylene (HDPE) Pipe and Fittings

2 Inches and Smaller – Pipe shall be manufactured from a PE 3408 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material will meet the specifications of ASTM D3350-99 with a cell classification of PE:345464C. Pipe shall have a manufacturing standard of ASTM D2737 (CTS). Pipe shall be DR 9 (200psi WPR) unless otherwise specified on the plans. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipes shall be suitable for use as pressure conduits, and per AWWA C901, have nominal burst values of three times the Working Pressure Rating (WPR) of the pipe. Pipe shall also have the following agency listing of NSF 14.

4 Inches and Larger - Pipe shall be manufactured from a PE 3408 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material will meet the specifications of ASTM D3350 with a cell classification of PE:345464C. Pipe shall have a manufacturing standard of ASTM F714. Pipe O.D. sizes 4" to 24" shall be available in both steel pipe sizes (IPS) and ductile iron pipe sizes (DIPS). Pipe O.D. sizes 26" to 54" shall be available in steel pipe sizes (IPS). Pipe shall be DR 17 (100psi WPR) for pipe sizes up to 36" unless otherwise specified on the plans. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipes shall be suitable for use as pressure conduits, listed as NSF 14, and per AWWA C906 Pressure Class (PC) 100 have a nominal burst value of three and one-half times the Working Pressure Rating (WPR) of the pipe.

Pipe fittings and flanged connections, to be joined by thermal butt-fusion, shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

Field fusion welding will not be allowed unless specified or approved by the Consultant.

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Socket fusion, hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.

Butt Fusion Fittings - Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99, and approved for AWWA use. Butt Fusion Fittings shall have a manufacturing standard of ASTM D3261. Molded & fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records. All fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

Electro fusion Fittings - Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99. Electro fusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All electro fusion fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

Flanged pipe sections for mechanical joining shall be comprised of HDPE flange adapters and Ductile Iron slip-on backup rings. Flange adapters shall conform to PE 3408 HDPE, Cell Classification 345464C as determined by ASTM D3350-99. Ductile Iron slip-on backup rings shall conform to ASTM A536-84.

Flanged pipe sections for mechanical joining shall be comprised of HDPE flange adapters and Ductile Iron Glass Reinforced Polypropylene Encapsulated slip-on backup rings. Flange adapters shall conform to PE 3408 HDPE, Cell Classification 345464C as determined by ASTM D3350-99. Ductile Iron slip-on backup rings shall conform to ASTM A536-84 and be encapsulated with glass reinforced polypropylene.

Flanged pipe sections for mechanical joining shall be comprised of HDPE flange adapters and Stainless Steel 316 slip-on backup rings. Flange adapters and shall

conform to PE 3408 HDPE, Cell Classification 345464C as determined by ASTM D3350-99. Stainless Steel 316 slip-on backup rings shall conform to ASTM A351CF8M.

### Carbon Steel Pipe and Fittings

Carbon steel pipe and fittings shall conform to the associated standards listed in the section Reference Standards.

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Dimensions for carbon steel fittings shall conform to AWWA C110, unless otherwise specified.

Wall thickness for carbon steel pipe and fittings shall be specified by Schedule conforming to ANSI B36.10-1985.

Wall thickness and dimensions of carbon steel tubing shall be given in exact dimensions in fractions of an inch, not by gage number.

All flanges shall be carbon steel ring flanges conforming to AWWA C207 Class D. Flange drilling pattern shall be in accordance with ANSI B16.1/B16.5 standards.

Ring flanges shall be continuously welded on both sides.

Welding of carbon steel pipe and fittings shall be in accordance with the Reference standards.

All butt welds shall be fully penetrated with gas shielding to the interior and exterior of the joint.

Welded cross-sections shall have a thickness equal to or greater than the welded material.

Field welding of carbon steel pipe and fittings will not be allowed unless approved by the Consultant.

All welded joints shall be free of sharp edges and burrs.

Coating of the inside of carbon steel pipe and fittings is not required, unless otherwise specified.

Coating of the outside of carbon steel pipe and fittings shall be performed in the field, by the contractor, following installation of the manifold piping system. Surface preparation and coating procedures shall be in accordance with standards listed in Coatings specification.

### Flange Gaskets

Flange gaskets shall be full-faced and shall be in accordance with ASTM D1330.

Flange gasket drilling pattern shall conform to ANSI B16.1/B16.5.

Flange gaskets shall be 1/16" thick for flanges up to 14" diameter. 1/8" thick gaskets shall be provided for flanges over 14" diameter.  
Gasket material shall be EPDM.

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#### Fasteners

Hex head bolts and nuts shall be carbon steel conforming to ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2.

Hex head bolts and nuts shall be stainless steel 304 conforming to ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2.

Hex head bolts and nuts shall be stainless steel 316 conforming to ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2.

#### Vertical Piping Support Brackets (Adjustable)

All components of the bracket assembly shall be carbon steel in accordance with the associated standards.

All components of the bracket assembly shall be stainless steel 304 in accordance with the associated standards.

The bracket assembly shall provide a minimum of 2" of lateral adjustment for alignment of the vertical pipe section with the connection to the lateral piping and/or tank penetration.

The bracket assemblies shall consist of two weldments:

A base plate weldment that consists of a base plate with a center-located tubular guide. A top-works weldment that consists of a support plate formed to provide 120° contact area with the pipe, and a center-located pipe stub welded to the bottom of the support plate. U-bolt(s) and hex nuts are provided with the top-works.

The pipe stub shall be inserted into the tubular guide of the base plate weldment during installation of the assemblies.

The base plate weldment shall be anchored to the concrete shell with stud type expansion anchors, the pull-out rating of the combined anchors shall be a minimum of 10 times greater than the static weight of the vertical pipe section.

The base plate of the base plate weldment shall be field welded to the tank shell. The location of the base plate shall avoid welded joints and rivets in the tank shell.

A 1/8" thick EPDM strip with a length equivalent to the circumferential support length of the support plate shall be placed between the pipe and the pipe supports.

The base plate weldment and top-works weldment shall be joined by field welding following proper horizontal adjustment of the assembly.

#### Horizontal Piping Support Brackets (Adjustable)

All components of the bracket assembly shall be carbon steel in accordance with the associated standards.

All components of the bracket assembly shall be stainless steel 304 in accordance with the associated standards.

The bracket assembly shall provide a minimum of 2" of vertical adjustment for alignment of the horizontal pipe section with reservoir floor.

The bracket assemblies shall consist of two weldments:

A base plate weldment that consists of a base plate with a center-located tubular guide. A top-works weldment that consists of a support plate formed to provide 120° contact area with the pipe, and a center-located pipe stub welded to the bottom of the support plate. U-bolt(s) and hex nuts are provided with the top-works.

The pipe stub shall be inserted into the tubular guide of the base plate weldment during installation of the assemblies.

The base plate weldment shall be anchored to the concrete floor with stud type expansion anchors, the pull-out rating of the combined anchors shall be a minimum of 10 times greater than the static weight of the vertical pipe section.

The base plate of the base plate weldment shall be field welded to the tank floor. The location of the base plate shall avoid welded joints in the tank floor.

A 1/8" thick EPDM strip with a length equivalent to the circumferential support length of the support plate shall be placed between the pipe and pipe supports.

The base plate weldment and top-works weldment shall be joined by field welding following proper vertical adjustment of the assembly.

#### Vertical Pipe Supports (Non-Adjustable)



Non-adjustable vertical pipe supports consist of a piece of pipe approximately 1/3 the riser diameter to be welded between the riser and tank shell. Alternatively, two carbon steel angle irons welded between the vertical riser and the tank shell.

The angle irons shall be field cut and welded in place at 45° angles on each side of the vertical pipe centerline. The included angle between the angle irons shall be 90°.

The location of the pipe supports (pipe or angle irons) shall avoid welded joints and rivets in the tank shell.

#### Coatings

Following installation of the manifold system, all carbon steel and ductile iron pipe, fittings, bolted connections, pipe supports, and appurtenances shall be coated according to the interior tank paint specification as specified by the Consultant.

Surface preparation and coating procedures shall be provided by the Consultant and the paint supplier.

#### 12.0 Delivery, Storage, and Material Handling

Individual duckbill valves shall be packaged separately from the piping equipment.

All flanges shall be protected by using plastic inserts or plank wood; pipe sections are to be fully supported to prevent pipe deflection or damage to fittings or connections.

All equipment shall be shipped on pallets capable of fully supporting the pipe sections across their entire length. Pallets should be accessible for fork lift transport or strap and hoist means without causing any load to the pipe equipment.

All stainless steel components shall be stored separately away from any carbon steel components or other materials which could stain or deface the stainless steel finish from run-off of oxidized ferrous materials.

All pipe equipment should be covered and stored in areas free from contact with construction site sediment erosion to prevent accumulation of materials within the pipe and fittings.

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Duckbill valves should be protected from contact with rigid objects during handling and storage. The contractor shall be responsible for replacing any duckbill valves or elastomer components which are damaged after arrival on the site through installation and start-up of the system.

#### Submittals

#### System Installation Drawings

The duckbill valve manufacturer shall be responsible for providing engineering installation drawings of the complete manifold piping system as supplied by the manufacturer. These drawings shall include plan view piping arrangement, sections and elevations as required, support bracket installation details, duckbill valve orientation details, and all dimensions required for locating the system within the specified dimensions of the tank.

Drawings shall be a minimum of 11 x 17 inches.

Six (6) sets of plans shall be provided to the Consultant for review and approval.

Two (2) sets of final fabrication and installation drawings shall be included with the shipment of the manifold piping equipment.

#### Installation, Operation and Maintenance Manuals

Within 30 days of final approval of the installation drawings, by the Consultant, the duckbill valve manufacturer shall provide four (4) sets of the installation portion of the Installation, Operation and Maintenance (IOM) Manuals for the applicable system.

Within 30 days of final approval, by the Consultant, of the installed system the manufacturer shall provide six (6) copies of the complete Installation, Operation and Maintenance (IOM) Manual for final review and approval.

The manuals shall be in the following format and include the listed required information as a minimum:

- Enclosed in a 3-ring binder with project title and system designation shown on the front cover and side binder.
- Table of contents with separation tabs.
- Copy of hydraulic calculations for the manifold system (as developed by the manufacturer).
- Copy of complete set of installation plans.
- Parts and equipment list with specification numbers for ordering of replacement parts.
- Product specification sheets for duckbill valves, expansion joints, concrete anchors, and any other specialized items supplied with the system.
- Installation guidelines for the manifold system and individual duckbill valves.

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#### **Operational procedures for the manifold system**

- Guidelines for repair of system components.

- Schedule for suggested periodic maintenance of the manifold system.

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#### Installation

Installation of the manifold system shall be in accordance with the guidelines provided by the duckbill valve manufacturer as specified in the installation section of the IOM manual. Refer to section on Submittals for quantities and delivery schedules of the documents.

#### Start-Up and Testing Procedures

#### Leveling of Lateral Piping

The centerline elevation of all lateral distribution piping shall be installed at the same elevation across the entire system unless eccentric

reducers are utilized then the governing elevation point shall be the bottom invert of the pipes.

The Contractor shall be responsible for providing a leveling instrument during installation of the piping for maintaining manifold pipe constant elevation as specified on the installation drawings.

The elevation variance shall not exceed +/- 1" difference of the specified elevation on the installation drawings.

#### Start-Up Flow Testing

Following installation of the complete manifold piping system, the contractor shall open the upstream isolation valve to allow flow into the tank through the manifold system. The isolation valve must be opened slowly to prevent surge or over-pressurization of the manifold system. The isolation valve must be fully opened to inspect the flow characteristics manifold system.

The contractor shall visually inspect the entire piping system for leakage.

The contractor shall visually inspect all of the inlet duckbill valves to ensure flow is being discharged into the tank through all duckbill valves.

#### Spare Parts

Spare parts are not required, unless otherwise specified.

#### Warranty

The complete manifold piping system shall be supplied by the duckbill valve manufacturer to maintain single source responsibility for the system. The complete system shall be defined as all piping and appurtenances within the tank downstream of the tank penetration. Appurtenances include pipe, fittings, horizontal and vertical pipe supports, expansion joints, duckbill valves, and any other equipment specified within this section of the specifications.

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All piping, pipe support brackets, joint connections, expansion joints, and anchors shall be warranted by the duckbill valve manufacturer against failure under design conditions for a period on one (1) year from the date of final installation approval by the Consultant.

Duckbill Valves shall be warranted by the manufacturer against failure under design operating conditions for a period of one (1) year from the date of final installation approval by the Consultant. Elastomer components damaged as a result of maintenance activities, foreign debris, or excessive exposure to direct ultraviolet and thermal radiation shall be excluded warranted coverage.

### **SERIES WF-3 WATERFLEX CHECK VALVES**

#### PART 1 GENERAL

##### SUBMITTALS

Submit product literature that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, headloss and flow data, and pressure ratings.

Upon request, provide shop drawings that clearly identify the valve dimensions.

## QUALITY ASSURANCE

Supplier shall have at least ten (15) years experience in the manufacture of "duckbill" style elastomeric check valves.

## PART 2 PRODUCTS

### 2.01 WATERFLEX WF-3 CHECK VALVES

The perforated disc shall be fabricated of stainless steel plate with welded support gussets. The disc shall be flanged and drilled to mate with ANSI B16.1, Class 125/ ANSI B16.5 Class 150 flanges. The disc shall have three (3) tapped holes used for fastening the membrane and support rod to the disc with stainless steel bolts, nuts, and lock washers. The top of the disc shall be tapped and supplied with lifting eyebolt for installation.

The Waterflex membrane shall be circular, one piece rubber construction with fabric reinforcement. The diameter of the membrane shall allow adequate clearance between the membrane O.D. and the pipe I.D. The membrane shall be vulcanized with a specified convex radius to produce a compression set to allow the membrane to seal against the perforated disc at low reverse differential pressure.

The support rod shall be stainless steel and drilled with three (3) longitudinal holes to allow fastening of rod to membrane and perforated disc.

Manufacturer must have available flow test data from an accredited hydraulics laboratory to confirm pressure drop data. Company name and location shall be vulcanized on the membrane. Valves are to be manufactured in the USA.

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### 2.02 FUNCTION

When line pressure inside the valve exceeds the backpressure outside the valve, the line pressure forces the membrane to open, allowing flow to pass thru the perforations in the disc. When backpressure exceeds the line pressure, the membrane seats on the perforated disc preventing backflow.

### 2.03 MANUFACTURER

All valves shall be of the Series WF-3 as manufactured by the Red Valve Co., Inc. of Carnegie, PA 15106 or approved equal.

## PART 3 EXECUTION

### INSTALLATION

A. Valve shall be installed in accordance with manufacturers written Installation and Operation Manual and approved submittals.

### 3.02 MANUFACTURER'S CUSTOMER SERVICE

Manufacturer's authorized representative shall be available for customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

Manufacturer shall also make customer service available directly from the factory in addition to authorized representatives for assistance during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

## **SERIES 37 FLANGED IN-LINE CHECK VALVES WITH RETAINING RING**

### PART 1 GENERAL

#### 1.01 SUBMITTALS

Submit product literature that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, headloss and flow data, and pressure ratings.

B. Upon request, provide shop drawings that clearly identify the valve dimensions.

#### 1.02 QUALITY ASSURANCE

Supplier shall have at least fifteen (15) years experience in the manufacture of "duckbill" style elastomeric valves, and shall provide references and a list of installations upon request.

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Manufacturer shall have performed hydraulic tests on valves through 48" for flow capacity, headloss, and jet velocity at an accredited flow laboratory. Manufacturer shall provide test data upon request.

Upon request, manufacturer shall provide installation data for existing valves of similar size and type to the project scope.

### PART 2 PRODUCTS

#### 2.01 "DUCKBILL" ELASTOMERIC CHECK VALVES

Duckbill Check Valves are to be all rubber and the flow operated check type with a flanged end connection. The port area shall contour down to a duckbill, which shall allow passage of flow in one direction while preventing reverse flow. The flange and flexible duckbill sleeve shall be one piece rubber construction fabricated of NSF61 approved elastomers with nylon reinforcement.

The flange drilling shall conform to ANSI B16.1 Class 125/ANSI B16.5 Class 150 standards. The valve shall be furnished with stainless steel back-up rings for installation.

Company name, plant location, valve size and serial number shall be bonded to the check valve. Elastomeric duckbill check valve shall be manufactured in the United States of America. A single manufacturer shall supply all elastomer duckbill check valves.

## 2.02 FUNCTION

When line pressure inside the valve exceeds the backpressure outside the valve, the line pressure forces the bill of the valve open, allowing flow to discharge. When backpressure exceeds the line pressure, the bill of the valve is forced closed preventing backflow.

## 2.03 MANUFACTURER

All valves shall be of the Series 37 as manufactured by the Red Valve Co., Inc. of Carnegie, PA 15106 or approved equal.

## PART 3 EXECUTION

### INSTALLATION

Valve shall be installed in accordance with manufacturers written Installation and Operation Manual and approved submittals.

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## **SERIES 35 FLANGED-ENDS CHECK VALVES**

### PART 1 GENERAL

#### SUBMITTALS

Submit product literature that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, headloss and flow data, and pressure ratings.

Upon request, provide shop drawings that clearly identify the valve dimensions.

#### QUALITY ASSURANCE

Supplier shall have at least fifteen (15) years experience in the manufacture of "duckbill" style elastomeric valves, and shall provide references and a list of installations upon request.

Manufacturer shall have performed hydraulic tests on valves through 48" for flow capacity, headloss, and jet velocity at an accredited flow laboratory. Manufacturer shall provide test data upon request.

Upon request, manufacturer shall provide installation data for existing valves of similar size and type to the project scope.

### PART 2 PRODUCTS

## 2.01 "DUCKBILL" ELASTOMERIC CHECK VALVES

Duckbill Check Valves are to be all rubber and the flow operated check type with a flanged end connection. The port area shall contour down to a duckbill which shall allow passage of flow in one direction while preventing reverse flow. The flange and flexible duckbill sleeve shall be one piece rubber construction fabricated of NSF61 approved elastomer with nylon reinforcement.

The flange drilling shall conform to ANSI B16.1 Class 125/ANSI B16.5, Class 150 standards. The valve shall be furnished with stainless steel back-up rings for installation.

Company name, plant location, valve size and serial number shall be bonded to the check valve. Elastomeric duckbill check valves shall be manufactured in the United States of America. A single manufacturer shall supply all duckbill check valves.

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## 2.02 FUNCTION

When line pressure inside the valve exceeds the backpressure outside the valve, the line pressure forces the bill of the valve open, allowing flow to discharge. When backpressure exceeds the line pressure, the bill of the valve is forced closed preventing backflow.

## 2.03 MANUFACTURER

All valves shall be of the Series 35 as manufactured by the Red Valve Co., Inc. of Carnegie, PA 5106 or approved equal.

## PART 3 EXECUTION

### INSTALLATION

Valve shall be installed in accordance with manufacturers written Installation and Operation Manual and approved submittals.

### MANUFACTURER'S CUSTOMER SERVICE

Manufacturer's authorized representative shall be available for customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

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Manufacturer shall also make customer service available directly from the factory in addition to authorized representatives for assistance during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

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