SECTION 3 - STRUCTURE REQUIREMENTS

3.1 DESIGN CRITERIA

All reinforced concrete structures shall be designed using the Working Stress method. At a minimum this includes the wet well, valve chamber and control pad. The strctures may be either pre-cast or cast-in place as approved by the District.

3.2 JOINING CHAMBERS

The valve chamber shall rest on a haunch poured intregal with the wet well walls. Both chambers shall be tied together with a minimum of two (2) threaded tie bolts. The designing engineer shall specify the bolt diameter and material strength. Bolts are to be eighteen inches (18") down from the top of the structure. For top slab thickness greater than 12 inches (12"), place the bolts down six inches (6") from the bottom of the top slab.

One-half inch ($\frac{1}{2}$") thick 6" x 6" backing plates shall be used as washers on each end of the tie bolts. Both structure tops shall be at the same elevation seperated by a one-inch (1") square flexible rubber mastic sealant placed along the perimeter of the valve chamber where it meets the wet well. The tie bolts and the 6" x 6" backing plates shall be stainless steel.

3.3 ACCESS HATCHES

Access hatches shall be cast in the top sections of each chamber. The hinged side of the valve and pump chamber hatches shall be located on the walls opposite from each of their respective common tie walls. For valve chambers requiring double htach doors, the hinges shall be placed on the common wall and the wall opposite the common wall. Hatch specifications are provided in Section 6.6.

3.4 ACCESS OPENINGS

In addition to the openings for the incoming gravity lines and pump discharge lines, the following accesses are required:

- A six-inch (6") hole shall be centered in the valve chamber tie wall, 20 inches (20") from the structure top. A four-inch (4") SCH40 DWV PVC coupler shall be cast in the center of the wet well tie wall and centered on the valve chamber six-inch (6") hole. After the two chambers have been tied together, a four-inch (4") PVC stub shall be glued in the coupler on the valve chamber side through the six-inch (6") hole. The space between the pipe and the chamber walls shall then be filled and sealed with grout. This opening will be used for power and control wire passage between chambers.
- A six-inch (6") hole shall be centered at the bottom of the valve chamber floor in the tie wall. A four-inch (4") PVC coupler shall be cast in the wet well tie wall and centered with the valve chamber six-inch (6") hole. After the two chambers have been tied together, two (2) four-inch (4") PVC stubs shall be glued into the coupler on each side of the tie wall. These stubs will be used for the valve chamber drain piping.
- Two two and one half-inch (2 $\frac{1}{2}$") holes shall be placed on each side of the valve chamber sidewalls, eighteen-inches (18") from the tie wall and eighteen-inches (18") from the top of the structure. For a top slab thickness greater than ten-inches (10"), place the two and one half-inch (2 $\frac{1}{2}$") holes down eight-inches (8") from the bottom of the top slab. A two and one half-inch (2 $\frac{1}{2}$") PVC coupler shall be cast in each hole. One of the openings is to be used for the power and control wires from the control panel. Two openings are provided for flexibility. The opening not used shall be stubbed and capped with a piece of two and one half-inch (2 $\frac{1}{2}$") PVC.

3.5 VALVE CHAMBER FLOOR

The valve chamber floor shall be sloped with a three-sided invert towards the four-inch (4") drainpipe using a two-inch (2") fillet. Gravity pipes, detention pipes and electrical conduits may not be run beneath the valve chamber.

3.6 VALVE SUPPORTS

Valve chamber piping shall be supported as follows:

- After discharge piping and valves have been installed in the valve chamber and adjustable pipe cradle jack shall be under the valves and tee, so that they have a ten-inch (10") clearance between the floor and valve flanges. The supports shall be firmly bolted to the valve chamber floor.
- A second adjustable pipe cradle jack shall be placed against the back of the discharge tee and then bolted to the common chamber tie wall to prevent piping thrust movement. The thrust jack shall be shown on the valve chamber plan drawing.

3.7 ENTRANCE LADDER

Wet well entrance ladder shall be constructed from 304 or 316 stainless steel stock rungs three quarter-inch ($\frac{3}{4}$") round. Side rails and supports $\frac{1}{2}$" x 2" strap. Rungs shall be spaced 16 inches o.c. x 1 foot wide. Support bracket spacing shall not exceed 8 feet. Brackets shall be attached to the concrete wall with $\frac{1}{2}$" x 3" stainless steel wedge anchors. The entrance ladder shall be located as follows:

- Entrance ladder shall not be placed in front of incoming gravity lines.
- Entrance ladder shall not be located under or next to any obstructions.
- Entrance ladder should provide a clear-in-line visible unobstructed access from the top of the chamber to the bottom of the chamber.
- Entrance ladder should be placed on the station sidewalls closet to the control panel, approximately in the center of the hatch cover.

3.8 DETENTION CHAMBER

Detention shall be installed below ground with an access manhole(s) located at the upstream end. The connection between the detention chamber(s) and the wet well shall be made with a minimum eight-inch (8") ductile iron pipe. The detention tank must be a dedicated system, it may not be used as part of the gravity system. The detention tank and connection line shall be laid at a minimum 1% slope.

3.9 CHAMBER SIZING

The pump station wet well and valve chamber shall sized as noted. Access hatches will be correspondingly sized to chosen structure size.

VALVE CHAMBER		WET WELL	
INSIDE AREA	ACCESS HATCH SIZE	INSIDE AREA	ACCESS HATCH SIZE
5' x 5'	60" X 60"	5' x 5'	48" X 60"
5' X 6'	72" x 72"	6' X 6'	48" X 72"
7' X 7'	84" x 84"	7' X 7'	60" x 84"
8' X 8'	84" x 84"	8' X 8'	60" x 84"

To prevent the possibility of the valve chamber pulling the top section of the wet well off of the joint, a poured counter-weight is required to offset the mechanical level arm tipping force. The counter-weight shall be monolithically poured at the bottom of the upper-most wet well section opposite of the valve chamber tie wall. Size and weight of the counter-weight shall be shown on the plans.

3.10 CONTROL STRUCTURE PAD

The control structure concrete pad shall be a minimum of four-inches (4") thick, reinforced with 8 gauge, 6 x 6 welded wire mesh. The concrete shall have a well-compacted four-inch (4") stone base (minimum).

The pad shall be poured next to the pump station. parallel to the length of the stationstructure and centered between the two chambers. Pad deminsions shall be 6' x 11'-4".

3.11 MISCELLANEOUS ITEMS

A. Incoming Manhole Placement
A manhole shall be placed on the gravity line by approximately 20 feet from the pump station structure.

B. Detention Chamber Placement
The eight-inch (8") pipe joining the detention chamber(s) and the pump station shall be no less than 20 feet in length.

C. Bulk Heading
Bulk heading of the detention chamber(s) shall be completed with a pre-cast bulkhead.

D. Construction Tolerance of Wet Well
The wet well shall be installed so that it is no more than three-inches (3") per 25 vertical feet out of plumb.

E. Connection of Gravity Pipe to Structures.
All incoming gravity lines and discharge piping will have a "Z-lok" or "A-lok" type compression fitting cast-in place where the piping passes through the valve and wet well chamber walls. The maximum angle of deflection allowed for pipe gaskets is as follows:

"Z-lok" = 25 degree
"A-lok" = 7 degree

All piping outside diameters will be located a minimum of one foot above or below structure joints.

F. Top of Wet Well and Valve Chamber
The top elevation shall be six-inches (6") higher than the surrounding ground elevation. Surrounding ground shall be sloped away from the structure for proper drainage.

SECTION 4 - PIPING AND VALVES

The following specifications shall be used for installation of the pump station piping and valves. Flanged piping shall be the acceptable means of connecting piping and valving.

All pipes must enter the structure walls with a one foot minimum clearance from the outside face of the pipe to the face of the adjoining wall to allow for proper pipe gasket alignment.

4.1 DISCHARGE PIPE MATERIAL

A. From the individual pump discharge bases through the header tee to a minimum of four feet (4') outside the structural wall, following materials shall be used:

1. Four Inch (4") Diameter and Above:
Flanged: Ductile iron pipe Class 53 ANSI A-21.51 (AWWA C-151). All bolts and nuts for flanged connections must be 304 stainless steel (minimum). All flange gaskets must be full-face $\frac{1}{8}$" thick red rubber.

2. Three inch (3") Diameter:
Solvent-Weld Installation: ASTM 1785 Schedule 80 PVC.

B. The following materials should be used for the force main from a point four feet (4') outside the chamber wall to the discharge manhole.

1. Four Inch (4") Diameter and Above:
- AWWA C-900 PVC Class 150
- Ductile Iron Pipe Class 52 ANSI A-21.51 (AWWA C-151)
- AWWA C-909 PVCO (for pipes 4-inch through 12-inch)
- AWWA C-905 PVCO (for pipes 14-inch through 48-inch)

2. Three-Inch (3") Diameter:
- PVC meeting AWWA C-900 PVC Class 150 with integral bell and gasket joint design meeting the requirements of ASTM D3139 and F477. Minimum pressure class shall be PC 150.
- Ductile Iron Pipe Class 52 ANSI A-21.51 (AWWA C-151).

4.2 FORCE MAIN REQUIREMENTS

The following elements shall be included in the force main system design:

A. Air Relief/Vacuum Valves (ARV)
Automatic combination vacuum/air relief valves shall be placed at high points in the force main as required. The valve shall be equipped with all backwash accessories.

Acceptable Manufacturer: ARI Model D-025 NS (minimum standard)

B. Connection to Gravity System
Force mains shall discharge to the gravity sewer at a manhole. The point of connection shall be no more than one foot above the flow line of the receiving manhole.

C. Existing Gravity Manhole Rehabilitation
The sides and bottom of the force main discharge manhole and a minimum of two (2) downstream manholes from the point of connection shall be lined with a solventless, 100% solids, corrosion resistant epoxy coating or a lining having multiple, structural fiberglass layers with a non-porous diaphragm bonded between the layers of fiberglass and molded to the exiting structure.

Acceptable Manufacturer: Raven Lining Systems AquataPoxy A-6, Terre Hill Composites Multiplex Liner THC-610-SL-68 or approved equal.

D. New manhole Construction
When a new manhole is to be constructed at the point of connection to the gravity system, the manhole shall be manufactured with a flexible sheet liner with locking expansions. The bottom of the new manhole shall be treated with the epoxy coating specified above.

Acceptable Manufacturer: Ameron Protective Lining Division, Amer-Plat T-Lock or approved equal.

E. Mechanically Restrained Joints
The force main shall be fitted at all angle points with mechanically restrained joints designed to withstand the thrust developed under the test pressure plus 50 psi. The required number of mechanically restrained joints from the angle point shall be determined by the design engineer and shown on the plan and profile (see Section One).

F. Clean-Outs
The need for clean-outs on the force main shall be determined during plan review by DCSD. As a general guide, clean-outs will not be required on force mains less than 1800 feet in length. If clean-outs are required, refer to DCSD construction specifications.

G. Tracer Wire
On all force mains there shall be installed a tracer wire which shall be a single insulated No. 12 AWG copper wire. The insulated wire shall be furnished in rolls not less than 500 feet. Where splices are required, splices shall be made with 3M waterproof splice kits or approved equal. The Contractor shall furnish all materials. The No. 12 wire shall placed along the top of the force main and taped in place with duct tape or electrical tape at a maximum of 6 feet intervals. Permanent access points shall be provided through manholes, access vaults, valve vaults or other approved means at the ends of the tracer wire. the wire shall be extended into access points at a minimum of 5 feet from each direction. The wire shall be neatly rolled and placed so that it does not interfere with normal operation. After testing for continuity, the splices inside the access point shall be made with a 3M splice kit or approved equal. Where splices become necessary outside of access points, the splices shall be made with a 3M splice kit or approved equal. All tracer wire shall be tested for continuity as called for in Section 4.2 1 below.

H. Utility Marking Tape
A detectable underground utility marking tape shall be installed the entire length of the force main as per DCSD Detail FM-1. The material to be installed for this purpose shall consist of three (3) inch wide tape made of bonded layer plastic with a metallic foil core. Tape splices shall be knotted to prevent tensile pressure on the splice. The metallic tape shall be colored green and shall bear an imprint identifying the force main blow as, "Caution Buried Sewer Main Below". The Contractor shall furnish all materials. The three (3) inch wide tape shall be installed 12" below finished grade. The tape material shall be installed in accordance with manufacturer's recommendations. The tape is to be placed in a manner such that trench backfill will not place an excessive stress on the material.

1 Testing
Testing of force mains shall include:
1. Force mains shall be pressure tested at the highest point in the project. The Contractor shall fill and pressure test the force main. The minimum required test pressure shall be the force main tes' pressure for a period of 2 hours with a maximum of not more than 2 PSI drop in pressure.
2. The tracer wire on all force mains shall be tested by the Contractor for continuity in the presence of a DCSD Construction Inspector. If the test is satisfactory, all splices shall be made permanent by means of a 3M splice kit or approved equal. If test fails in a section, the Contractor shall find and repair any failure in the locator wires.

4.3 TRANSITION PIPING

When PVC pipe (See Section 4.1) is used for force main outside the structural walls, a transition pipe must be used to make the transition between the bypass tee inside the valve chamber and the force main outside the station structure. The following methods shall be used:

A. Four-inch (4") Diameter and Larger
Both pump discharge lines shall be joined to a flanged cast iron tee. A flanged DIP stub shall be bolted to the tee then passed through the "A-lok" or "Z-lok" gasket installed in the valve chamber discharge wall. The PVC force main shall be attached to the D.I.P. stub outside of the valve chamber by a long pattern sleeve mechannical joint with Mega-Lug retainer glands.

B. Three-Inch (3") Diameter
Both pump discharge lines shall be joined to a schedule 80 PVC flanged tee. From the tee, a Schedule 80 PVC stub shall pass through the "A-lok" or "Z-lok" gasket installed in the valve chamber discharge wall. Transition the stub to the C-900 PVC force main with a PVC coupling outside of the valve chamber.

4.4 DISCHARGE RISERS

When plastic pipe is utililized for the pump discharge riser and the riser exceeds 12 feet in length, a stainless steel support brace must be installed between the riser and wet well wall. The brace shall be placed approximately in the middle of the riser but kept above the normal operating level of the well. A minimum of two (2) braces will be needed on lengths in excess of 20 feet.

4.5 SHUT-OFF AND CHECK VALVES

Approved shut-off and check valves shall be placed on the discharge line of each pump. The check valves shall be located between the shut-off valve and the pump. All valves shall be rated so as to withstand normal working pressure plus allowances for the water hammer. No pump discharge valve shall be vertically mounted or located in wet well area.

A. Shut-Off Valves
Shut-Off valves shall be plug type valves. The valves shall be located so that each pump may be isolated from the common discharge header. Plug valves shall be of cast iron body, ASTM A126 Class B, or ductile iron ASTM A536. Valve plugs shall be cast iron ASTM A126 Class B, or ductile iron meeting ASTM A536, Grade 65-45-12, covered with Buna-N Rubber compound. The seats are to be a corrosion resistant alloy either 304 stainless steel or nickel.

1. Valves shall be able to pass a sphere not less than 80% of the diameter of the valve size.

2. Valve Operations
- Six-Inch (6") and smaller valves shall be provided with a two-inch (2") square operating nut and wrench head
- Valves larger than six-inches (6") shall be provided with a Manual Gear Operator sized so that the maximum rim pull required is not more than 80 pounds.
- Valves three-inches (3") through twelve-inches (12") shall be rated at 175 pounds.
- Valves fourteen-inches (14") and larger shall be rated at 150 pounds when pressure is applied from the preferred direction. These valves have a preferred direction of shut-off, and is the responsibility of the contractor to see that they are properly installed.

Acceptable Manufacturers: DeZurik, Milliken or GA Industries.

B. Check Valves
Check valves shall be rubber flapper type with epoxy coated iron body. Check valves shall be flanged end type.

Acceptable Manufacturers: Valmatic, APCO, Milliken or GA Industries.

4.6 VALVE CHAMBER DRAIN VALVE

A backwater check valve shall be installed on the valve chamber drain line. The valve shall be installed as follows:

A four-inch (4") diameter PVC stub shall be glued into the four-inch (4") diameter coupler cast into the wet well wall at the valve chamber floor line. a 90-degree elbow shall be glued to this stub and directed toward the wet well floor. A 4" x 36" PVC stub shall be glued into the other end of the elbow. The check valve shall then be slipped on to the stub and attached with two (2) stainless steel clamps to be supplied by the vendor.

Acceptable Manufacturer: The valve should be a "Tide-Flex" series TF-2, 4-inch (slip on) check valve, by Red Valve Co., EVR Type CPO-4.

4.7 GRAVITY LINES ENTERING THE STATION

Ductile iron pipe shall be used on sections of gravity lines running from:

- The last manhole proceeding the station up to the station.
- The outfall of the detention pipes up to the station. This line shall be a minimum of eight-inches (8") in diameter.

Concrete or PVC gravity lines in these areas will not be acceptable.

4.8 DETENTION PIPE

Detention pipe(s) shall be a minimum of Class II. O-ring type reinforced concrete pipe. In areas where there will be vehicular traffic Class III, O-ring reinforced concrete pipe shall be required.

The detention pipe ends shall be bulkheaded using pre-cast bulkheads with an "A-lok" gasket installed in the outfall side.

All joints of the detention pipe(s) and the access manhole(s) require waterproofing. The bitumen shall consist of two coats of asphalt, coal-tar pitch or a coating meeting ASTM D-41. Asphalt shall conform to the requirements of ASTM D-449. Coal-tar pitch shall conform to the requirements of ASTM D-450. Coating shall be 31 mils in thickness. Waterproofing shall be applied at the plant. All joints shall also be covered with 12" wide GatorWrap or approved equal.

Acceptacle Material: Gator Wrap as manufactured by Sealing Systems, Inc. or Boa Tape as manufactured by Pipeline Seal & Insulator, Inc.

A vacuum test of all detention pipe shall be performed. The test should be for a period of 1 minute and the vacuum shall be 10" of mercury and may not drop below 9" of mercury at the end of the 1 minute test.

SECTION 5 - SUBMERSIBLE WASTEWATER PUMPS

5.1 MINIMUM STANDARDS

Pump selection shall be based on the following minimum standards:

- Single-phase pumps are not acceptable.
- Pumps less than three horsepower (3 Hp) are not acceptable.
- Non-clog pumps are the preferred type of pumps.
- District will only allow the use of grinder pumps upon receipt of a written requst for variance and acceptable justification.

All pumps, with the exception of grinder pumps, shall be capable of passing spheres of at least three-inches (7.6 cm) in diameter. Pipe suction and discharge piping shall be at least four-inches (10.2 cm) in diameter.

5.2 PUMP SPECIFICATIONS

The pump(s) shall be non-clog solids handling, submersible, capable of handling raw, unscreened sewage. The discharge connection elbow shall be permanently installed in the wet well along with the discharge piping. The pump(s) shall be automatically connected to the discharge elbow when lowered into place, and shall be easily removed for inspection of service. There shall be no need for personnel to enter the pump well. A simple linear downward motion of the pump shall accomplish sealing of the pumping unit to the discharge connection elbow. A sliding guide bracket shall be an integral part of the pump unit. No portion of the pump shall bear directly on the floor of the sump. The pump, with it's appurtenances and cable, shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of sixty five (65) feet.

A. Major Components
Major pump components shall be gray cast iron, Class 30, with smooth surfaces devoid of blowholes and other irregularities. Where watertight sealing is required, O-rings made of nitrile rubber shall be used. All exposed nuts and bolts shall be ASTM A-167 304 stainless steel.

B. Watertight Seals
All mating surfaces where watertight sealing is required shall be machined and fitted with nitrile O-rings. Fitting shall be such that sealing is accomplished by metal-to-metal contact between machined surfaces. This will result in controlled compression of nitrile rubber O-rings without requirement of a specific torque limit. No secondary sealing compounds, rectangular gaskets, elliptical O-rings, grease or other devices shall be used.

The cable entry water seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall be comprised of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the entry body containing a strain relief function, separate from the function of sealing the cable.

The assembly shall bear against a shoulder in the pump top. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the motor interior from foreign materials gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

The junction chamber, containing the terminal board, shall be sealed from the motor by elastomer compression seal (O-rings). Where a sealed junction chamber is not used, the motor chamber shall be fitted with a moisture detection probe. The probe shall be connected to and activate a warning light in the conirol panel.

Connection between the cable conductors and stator leads shall be made with threaded compressed type binding post permanently affixed to a terminal board and thus perfectly leak proof.

C. Cooling System
Each system shall be provided with an adequately designed cooling system. When thermal radiators (cooling fins) are used, they shall be integral to the stator housing and shall be adequate to provide the cooling required by the motor. When water jackets are used, the water jacket shall encircle the stator housing. The water jacket shall be provided with a seperate, self-contained liquid cooling system. Regardless of the cooling system used, the motor must be capable of pumping under full load continuously with the water level only to the top of the volute. Motors with intermittent full load ratings or motors requiring oil for cooling will not be allowed.

D. Impellers
The impeller shall be of gray cast iron, Class 30, dynamically balanced, single or double shrouded non-clogging design having a long thrulet without acute turns. The impeller shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in normal sewage applications. The pump manufacturer shall, upon request, furnish mass movement of inertia data for the proposed impeller. The impeller shall be capable of passing a minimum 3-inch solid sphere. The fit between the impeller and shaft shall be a sliding fit with one key.

When double shrouded impellers are used, a wear ring system shall be installed to provide efficient sealing between the volute and impeller. The wear ring shall consist of a stationary ring made of nitrile rubber molded with a steel ring insert which is drive fitted to the volute inlet and rotating stainless steel ring which is drive-fitted to the impeller eye.

When single shrouded impellers are used, the volute shall be fitted with an adjustable replaceable front plate. The front plate shall be designed with a wave shaped inlet and an outward spiraling V-shaped groove on the side forcing the impeller to shred and force stringy solids outward from the impeller and through the pump discharge.

The volute shall be of single piece design and shall have smooth fluid passages large enough at all points to pass any size solid with can pass through the impeller.

E. Pump Motor
The pump motor shall be squirrel-cage, induction, and shell type design, housed in an air-filled watertight chamber. The stator winding and stator leads shall be insulated with moisture resistant Class F insulation that will resist a temperature of 155 degrees Celsius (F). The stator shall be dipped and baked three times in Class F varnish. The motor shall be designed for continuous duty, capable of sustaining a minimum of ten (10) starts per hour. The rotor bars and short circuit rings shall be made of aluminum.

The pump motor cable, installed, shall be suitable for submersible pump application. Cable sizing shall conform to NEC specifications for pump motors.

F. Thermal Sensors
Thermal sensors shall be used to monitor stator temperatures. The stator shall be quipped with three (3) thermal switches, embedded in the end coils of the stator winding (one switch in each stator phase). These shall be used in conjunction with and supplemental to external motor overload protection and wired to the control panel.

G. Pump Shaft
Each pump shall be provided with an oil chamber for the shaft sealing system. The drain and inspection plug, with positive anti-leak seal, shall be accessible from the outside.

The pump shaft shall rotate on two (2) permanently lubricated bearings. The upper bearing shall be a single row deep groove ball bearing and the lower bearing a two row angular contact ball bearing. The pump shaft shall be stainless steel or hard chrome plated carbon steel.

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. Seals shall run in an oil reservoir. Lapped seal faces must be hydro-dynamically lubricated at a constant rate. The lower seal unit, between the pump and oil chamber, shall contain one stationary and one positively driven rotating silicon carbide or tungsten carbide ring. The upper seal unit, between the oil symp and motor housing, shall contain one hard metal ring and one carbon ring, or angled to the shaft lip type seal in grinder pump applications. Each interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment, but shall be easily inspected and replaceable. The following mechanical seal types shall not be considered acceptable.

- Shaft seal without positively driven rotating members.
- Conventional double mechanical seals containing either a common single or double spring acting between the upper and lower units. This conventional system requires a pressure differential to offset external pressure and to effect sealing.

Acceptable Manufacturers: Sewage pumps are to be manufactured by the Flygt Company or ABS Company.

SECTION 6 - PUMP STATION APPURTENANCES

6.1 SLIDE RAILS

All pump-lifting slide rails shall be made of 316 Schedule 40 stainless steel pipe. Slide rails shall be installed and sized per manufacturer's instructions. The slide rails shall be firmly braced to the wet pit wall with stainless steel support brackets. Maximum spacing between brackets shall be every 15 feet.

6.2 LIFTING CHAINS

Pump lifting chain, clevise and shackles shall be made of 316 stainless steel. The chain shall be sized to accommodate the installed pump weight, but shall not be sized small than 3/16" stainless steel diameter links.

6.3 BOLTS

All field-installed bolts, nuts, and washers used inside either the pump or valve chamber shall be made of 316 stainless steel.

6.4 FASTENERS

All concrete fasteners used for installation of braces, brackets or boxes shall be stainless steel wedge type stud anchors. Anchor holes shall be drilled to the manufacturer's recommended depth. Pump base anchor studs shall be sized as follows:

- Four-inch (4") pumps and smaller = $\frac{5}{8}$" minimum.
- Six-inch (6") and eight-inch (8") = 1" minimum.
- Pumps larger than eight-inches (8") shall be installed with stainless steel anchors sized per the pump manufacturer instructions.

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PUMP STATION NOTES:
SHEET 1

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Drawn By: RLH
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Volz Project # 22074

06-28-21
C45

Duckett Creek Sanitary District

Duckett Creek Sanitary District

PUMP STATION DESIGN SPECIFICATIONS

Own By: MSM
Ckd By:
App By: KLA
Date: JAN. 2016
Detail No. SPEC-1

O'fallon Planning and Development Division File No.: 20-005554 | Approved: January 7, 2021

H:\CAD\22000-22999\22074\mp\Plans\22074 - C45 Pump Station Notes Sheet 1.dgn - Default 6/29/2021 5:08:33 PM Plotted by: rholmes Plot Scale: 1.0000 ' / in. Plot Driver: volz15_pdf.pltcfg Pen Table: Volz15_PDF.tbl