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CITY OF LAKE WALES

WASTEWATER PUMPING STATIONS

5.1 General

Contractor and or developer shall furnish all labor, equipment, and materials and shall perform all operations in connection with installation of a complete wastewater pumping (lift) station ready for use in accordance with the engineer's plans and specifications and the City's requirements, either specific or implied. This includes any and all restoration required to original site conditions.

5.2 Submittals

- A. Two (2) copies of shop drawings for all components, including wet well and valve box, shall be submitted to the City for review. The City retains the right to refuse any proposed substitution.
- B. Provide manufacturer's instructions, three (3) copies, for all manufactured components.
- C. Provide manufacturer's certification that all valves meet specification requirements.
- D. Provide warranty for all materials installed.

5.3 Design Requirements

- A. Flows: Wastewater pumping stations shall be designed to accommodate the full development flow from all contributing areas of the project at peak flow.
- B. Total Dynamic Head: Each pump shall have the capability of pumping the design peak flow at the maximum computed total dynamic head (TDH) with the pipe friction loss calculated by the Hazen-Williams formula. Design "C" values shall not exceed 130 for PVC pipe and shall not exceed 110 for ductile iron pipe. Static heads shall be calculated utilizing the worst case condition.
- C. System Head vs. Pump Capacity Analysis: System head vs. pump capacity curves shall be submitted illustrating the system operating capability at each of the following conditions:
 - (1) Conventional Pumping Station - Force Main (nonmanifolded):
 - (a) One pump running
 - (b) Two pumps running (triplex stations only)
 - (c) All pumps running (triplex stations only)
 - (d) If force main profile indicates that a siphon will be formed, provide curves showing operation at initial start-up conditions before siphon is formed.

(2) Manifolded Pumping Station/Force Main:

- (a) All conditions outlined for conventional pumping stations for each lift station.
- (b) Simultaneous operation of all pumping stations on the system (one pump operating in each station)

(3) Variable Speed Pumping Station:

- (a) All conditions outlined for conventional pumping stations and for manifolded systems, as applicable.
- (b) Operating point, including speed, at peak, average and minimum anticipated flows.

- D. Number of Pumps: Each pumping station shall have a minimum of two pumps for peak flows of 1000 gallons per minute or less. When the peak flow exceeds 1000 gallons per minute, then three or more pumps will be required. Standby pumping capacity shall be provided such that if any one pump is out of service, the remaining pumps shall be capable of pumping the estimated peak flows.
- E. Wetwell Design: Wet wells shall have sufficient capacity to provide a holding period of five minutes at the maximum pumping rate of the largest pump and shall be designed so that pumps will operate no more than (6) times per hour total (three times per hour each). Minimum wet well diameter shall be eight feet (8).

Additionally, the wet well shall be designed to prevent vortexing or air binding. The wet well floor shall have a minimum slope of 45 degrees toward a hopper bottom with the horizontal area of the bottom being no greater than necessary for proper installation and function of the pump suction. The high water level shall not be higher than six inches (6") below the invert elevation of the lowest influent pipe. The minimum water level shall be not less than eighteen inches (18") above the invert of the wet well.

- F. Odor Control: Chemical feed equipment shall be installed at stations where septic wastewater is anticipated or where the peak design flow of the station exceeds 1500 gallons per minute. Covered storage shall be provided for chemical feed equipment.
- G. Station Water System: All wastewater pumping stations shall be provided with a station water system, with adequate capacity and pressure. Hose bibbs shall be provided at convenient locations to facilitate maintenance. A vacuum breaker, of design approved by the City, shall be permanently installed on each hose bib.
- H. Flow Meters: Indicating, totalizing, and recording flow meters shall be provided on all wastewater pumping stations with an peak design flow of 750 gallons per minute or greater. Flow meters shall be of the magnetic type, with manufacturer and details to be approved by the City. Flow meters shall be sized to record the peak pumping capacity, with acceptable accuracy at anticipated minimum flows. The meter shall be direct reading in gallons per minute, totalizing in million gallons per day, and provide a 4-20 mA DC flow-proportional output. The flow metering system shall be installed within the valve vault, if space is available; in an exterior protected and drained meter vault; or above-ground. In all cases, meter by-pass valves and piping shall be provided.

Variable Speed Pump Control System: Variable speed pump control systems shall be

required for all pumps with a peak design flow of 750 gallons per minute or greater. When hydraulic conditions indicate a need for variable speed control, but the peak design flow is less than 750 gallons per minute, then the Utilities Director may require a variable speed control system.

Variable speed control systems shall be of a type and manufacturer approved by the City.

- I. Telemetry System: All pump stations shall be provided with a telemetry system compatible with existing City units or as specified by the Utilities Director.
- J. Emergency Power Supply
 - (1) For all pump stations that will be a re-pump station, a stand-by emergency generator shall be installed at the lift station site. Installation shall include a engine-generator set meeting City requirements. Unit shall be sized to automatically start and operate all pumps and controls without loading unit to more than 85% of its rated capacity and with a maximum voltage drop of 15%. The engine generator installation shall include fuel systems, automatic transfer switch, and enclosure. Installation of all items, including fuel tank, shall be in accordance with DEP regulations, applicable codes, and the manufacturer's recommendations.
 - (2) For all other pump stations provide an emergency generator receptacle as specified in Section 5.6 Control Panel.

5.4 Products

- A. All materials shall be new, of first quality, manufactured in the United States, and shall conform to the appropriate standard, latest revision.
- B. All fittings and materials shall be inspected by the City Utilities Department after delivery and prior to being installed.
- C. Concrete: All concrete used for lift station construction shall have a minimum compressive strength (28 Days) of 4,000 psi and shall be Type II Acid Resistant. Maximum slump by vibration shall be 3".
- D. Non-shrink Grout: All non-shrink grout used for lift station construction shall be Master Builder - Masterfiow 713, or equal.
- E. Wet Well
 - (1) Pre-cast wet wells shall be constructed in accordance with ASTM C478. All joints shall be sealed with pre-formed plastic joint sealant as specified for precast manholes.
 - (2) Interior and exterior of all wet wells shall receive Raven 405 with a minimum of 80 mils thickness, unless otherwise determined by the Director of Public Work.
 - (3) Backfill shall be made in accordance with applicable sections of these specifications.

- (4) All connections of pipes to or through the wet well shall be made utilizing Thunderline Link-Seal.

F. Access Frame and Accessories

- (1) Furnish and install aluminum hatch covers and access frame, size as shown on the standard details, over lift stations. All hatches shall be rated for a live load of 150 psi. Assemblies shall be complete with hinged and hasp-equipped cover(s), upper guide holder and level sensor cable holder. Frame shall be anchored securely above the pumps. Each door shall have safety-locking handle in operating position. Doors shall be of checkered plate. Minimum size 36" x 48".
- (2) Lower guide rail holders shall be integral with discharge connection; guide bars shall be two-(2) inch Schedule 40 stainless steel pipe as indicated on drawings.
- (3) Furnish and install one (1) aluminum hatch cover and access frame, size as Shown on plans, over each valve box. It shall be complete with hinged and hasp-equipped cover. Each cover shall have safety-locking handle in open position. Doors shall be of checkered plate. Minimum size 36" x 48".

G. Piping

- (1) Piping inside wet well and valve box shall be flanged ductile iron pipe (DIP), minimum thickness class 53.
- (2) Fittings inside wet well and valve **box** shall be flanged ductile iron, short- body.

H. Plug Valves:

Plug valves are not permitted.

I. Check Valves

Valves shall be rubber flapper type check valve with counter weight arm and cast iron body. Valve shall be Apco Series 100, or equal.

J. Pressure Gauges

A 1/2" nipple and solid brass ball valve shall be provided for attachment of a gauge on each wastewater discharge pump pipe, inside the valve box and before the check valve. A single nipple and valve shall be provided in the valve box on the discharge side of the plug valves at a point of common pressure with the force main.

5.5 Pumps

- A. Each pump shall be of the sealed submersible type. The pumps shall be capable of handling raw, unscreened sewage and shall utilize an impeller of non-clog design, double-

shrouded, with no acute angles. The pump casing shall be fitted with stainless steel wear rings with a minimum Brinnell hardness of 200-3 10. Each pump shall be equipped with seal failure probes and heat sensors. All pump fasteners shall be 303 stainless steel.

- B. Pump shall be provided with a balanced tandem mechanical seal cartridge. Seal case shall be constructed of 316 stainless steel with all seal faces and springs immersed in oil. Both sets of faces (both upper and lower sets) shall be tungsten carbide silver soldered to stainless steel retainers. Seal faces shall be self-aligning, positively driven, and each held by separate spring systems. Construction shall be such that no spring is exposed to the pumped media.
- C. Each pump motor shall be of the sealed submersible type with Class F insulation for operation in high-dielectric oil to give better heat dissipation and longer bearing life. Each motor stator shall be held in place with a removable end ring so that it can be removed for repair without heating outer shell or using a press. Motor housing shall be filled with high-dielectric oil and no pressure balancing devices shall be used. Pump motor-shaft shall be of 400 stainless steel and shall be designed to limit maximum shaft deflection due to axial and radial thrust loads to 0.16 mm. Pump shall be a standard production pump with attached universal coupling, ANSI 125 cast iron, which bolts to the pump discharge flange and accepts the discharge elbow provided by the pump manufacturer. Rail guides shall be fastened to the pump so all lifting will be applied to the guide supports. A lifting chain or cable of stainless steel, with a stainless steel hook shall be supplied for each pump.
- D. The discharge of each pump shall be fitted with a sealing flange. When pump is in operation, pressure shall provide a leak-proof seal. When pump is idle, pressure shall be removed so that pump can be removed from sump with no mechanical contact of sealing flanges. The seal is to be removable and mounted on the pump discharge flange. Seal material is to be Buna N rubber.
- E. Discharge elbow shall have 125-pound standard flanges. All fasteners, hardware, etc., are to be stainless steel.
- F. Pumps shall be as manufactured by Davis EMU or Hydromatic Pumps.

5.6 Control Panel

A. General

- (1) The sewage pump control panels shall be self contained complete duplex pump control unit containing U/L certification and the features described herein.
- (2) There shall be permanently affixed to the inside of the exterior enclosure door a nameplate indicating the voltage, phase, horsepower, order reference number, date manufactured and the control panel manufacturer's name, address and telephone.
- (3) All power wire shall be stranded and sized as required for load and application according the NEC. All control and signal wire shall be a minimum of #14 AWG, 90 degree insulated and color-coded. Colors shall red for all AC control, blue for all DC control, yellow for external source control, white for AC neutral, and green for equipment ground wiring. All wiring on the rear of the inner door shall be neatly bundled using tie wraps or

other means. All internal wiring on the backplate shall be neatly routed in wire duct with removable covers. All wiring shall be continuous point to point (no splices) and be totally accessible with permanent number marking on each end to match the control schematic drawings.

- (4) The panel shall be manufactured using quality workmanship and components. Upon completion of the panel it shall be completely factory tested. All control and alarm operations shall be performed with external signals simulated to insure proper operation. The three phase line voltage source for which the panel is intended shall be used for testing.

(5) Enclosure Construction and Materials

- (a) The pump controls shall be housed in a NEMA 3R stainless steel enclosure. The material used shall be 14 gauge, type 304 stainless steel with a 2B brushed finish. Construction shall be machine formed to provide rounded edges and solid seam welded. The completed enclosure shall have all welded seams ground smooth to a radius and buffed. The enclosure shall be mounted as shown and sized to house all the required components and all adequate space for testing and maintenance as necessary. The enclosure shall have backplate mounting studs, padlocking provisions, door latches and continuous hinge, all of stainless steel. The door gasket shall be continuous rubber composition with a molded in spring steel retainer for attachment to the enclosure without the use of adhesives and provide a positive weatherproof door seal.
- (b) The panel shall be mounted 30 inches minimum above ground level and have a hinged inner door of aluminum with a latch to protect all live internal wiring from operator personnel. The inner door shall be able to be opened to a minimum of 150 degrees to allow safe access to the components and have a locking device to hold door open for maintenance. Cutouts for breaker handles shall be provided to allow the operation of all circuit breakers through the inner door. All control switches, indicator pilot lights and motor starter overload reset pushbuttons shall be mounted on the inner door. The inner door shall be designed so that the mounting will not in any way penetrate the exterior of the control panel enclosure and deteriorate the NEMA rating. It shall also be designed to allow and provide full access to the sides, top and bottom of the control panel for power and control conduit entrance. All conduit entrances shall be made in a NEC approved manner. The conduits to the wet well shall have approved seal off fittings installed and properly sealed to protect the control panel from adverse damage from the wet well.
- (c) All components shall be securely mounted to the backplate with plated machine screws through machine thread tapped holes in the backplate. The screws shall be of adequate size for the device being secured. Permanent marking to identify each component as shown on the drawing shall be provided on the backplate.

(6) Power Distribution

- (a) The panel power distribution shall include all components as indicated below and be completely wired with stranded conductors having a minimum of 90 degree insulation rating and an ampacity rating a minimum of 125% of the motor ampere rating. All power wiring shall be neatly routed and totally accessible. All conductor terminations

shall be as recommended by the device manufacturer and be secure to provide adequate electrical conductivity.

- (b) The panel shall have a normal and emergency main circuit breaker. This will allow manual positive switching from the utility normal power source to a remote connected auxiliary standby power source when the normal power has failed. They shall also provide a positive disconnect for the normal and emergency as per the NEC for main breakers. The two breakers must be three (3) pole and of the same frame and size rating. The voltage rating shall match that of the incoming service. They shall be mounted side by side with an interlock to insure only one can be in the "ON" position at a time and with the breaker handles and mechanical interlock totally accessible through the inner door.

The line side of the normal breaker shall have adequately sized lugs attached to provide connection of the incoming normal power source conductors. The line side of the emergency breaker shall be wired to an exterior mounted standby generator power receptacle. The load side of the breakers are to be commonly connected and wired to the line side of each pump individual branch circuit breaker.

The normal and emergency breakers must have permanently attached positive mechanical interlock made of stainless steel. The interlock must be easily switched between the two breakers only when both breakers are in the off position. The interlock must provide that only one breaker shall be in the "ON" position at a time. When one is in the "ON" position the other must be positively blocked in the "OFF" position and the handle shall not be free to be inadvertently turned on. When either breaker is in the "ON" position it must be trip free to allow it to be totally operational should a fault or overcurrent cause the trip unit to open the breaker.

The external power receptacle, for the connection of a standby generator, shall match the system type. The receptacle shall be of reverse service design, 600 volt rated with an ampacity rating sufficient to carry the total load of the panel. It shall be securely mounted externally to the side of the enclosure to be fully accessible. The receptacle shall be totally weatherproof with a cover over the plug access opening that is permanently attached. Receptacle shall be Russell-Stoll No. JRSB1O44FR for pumps to 25 horsepower and No. JRSB2O44FR for pumps larger than 25 horsepower.

- (c) The pump motor breakers shall be thermal magnetic trip devices and provide for individual motor disconnect and overload/short circuit protection as required by the NEC. The breakers shall be three (3) pole and have a trip rating as indicated on the drawings that shall not exceed the NEC rating for motor branch circuit protection. The voltage rating shall match that of the panel incoming service. The breaker handles shall

be totally accessible through the inner door. All circuit breakers shall be Square D, Westinghouse, or Allen Bradley.

- (d) For all pumps less than 20 HP, the motor starters shall be NEMA rated three (3) pole devices with three-(3) pole overload relay protection. They shall provide the electrical start/stop control and running overload protection for each pump and have 120 volt operating coils. The thermal overload unit heater coils shall be ampacity rated per the

specific nameplate ampere rating of the pump motor and checked upon final inspection prior to system start up. Starters shall be Square D, Westinghouse, or Allen Bradley.

- (e) For all pumps 35 HP and larger, the motor starters shall be soft start controlled as per panel manufacturers specification.

(7) Power Panel Accessories

- (a) The panel power accessories shall include all components as indicated below and be completely wired with stranded conductors. All wiring shall be neatly routed and sized as required by the NEC.
- (b) The 120 volt common control circuit and the 24 volt float circuitry shall be protected by an auxiliary one (1) pole circuit breaker. The breaker handle shall project through the inner door. Circuit breaker shall be Square D, Westinghouse, or Allen Bradley.
- (c) The control panel shall have lightning arrestor protection included mounted on the outside of the panel to protect the motors and control equipment from lightning induced line surges. It shall be 600 volt rated and be a three-phase unit with connection to ground. The arrestor shall be mounted near the incoming power source and be properly wired to all three phases and ground. Lightning arrestor shall be Volt-Guard, no substitutions.
- (d) The control panel shall have surge capacitor protection included within the panel to protect the unit form damaging transient voltage surges. The surge arrestor shall be mounted near the incoming power source and be properly wired to all three phases and ground. The surge arrestor shall be a General Electric 9L18BAB3O1 or an approved equal.
- (e) A three phase monitor relay shall be installed to protect the motors. It shall be a three-phase voltage sensing devise that is adjustable for the system nominal voltage. It shall protect the control panel from loss of a single phase, even with a three-phase motor running on line, low voltage on all three phases simultaneously and phase sequence reversal. An output contact shall be wired in the pump motor starter control circuit.

Should the voltage fall below any of the parameters the phase monitor shall shut off the pumps. The phase monitor shall automatically reset when nominal voltage is restored to allow the pumps to restart. Phase monitor shall be Diversified SLA-230-ASA for 230 volt systems and SLA-440-ASA for 460 volt systems.

- (f) A receptacle shall be mounted on the inner door. The receptacle shall be a 15 ampere rated 3-wire ground fault interrupter duplex type. Provide circuit breaker for receptacle.

B. Duplex Pump Controls

- (1) The control circuit shall provide for the automatic and manual control and alteration of the pumps to maintain a pumped down condition of the wet well. The control system shall sense the wet well level through remote wet well level sensing regulator float switches. The source voltage for the float switches shall be 24 volt AC and the controls shall include all interposing relays.

Four regulator float switches shall include (1) all pumps off level, (2) lead pump on level, (3) lag pump and visual alarm on level, and (4) high alarm (audible) level to control the pumps operation and provide alarms. The set point elevation of each of the regulator floats shall be as indicated on the drawings. Terminal blocks shall be provided for each separate regulator float switch connection and other remote control device. The float switch cables shall be of sufficient length to be continuous from the panel terminals.

All control relays shall be multi-contact plug in type with track mounted bases.

The control system shall include alarm indication for high wet well level. The system shall have a lag pump delay timer to prevent simultaneous starting of both pumps.

Each pump shall have alarm indication and/or shutdown for motor thermal alarm protection, motor overload alarm, and pump failed alarm and seal failure alarm. The controls shall include but not be limited to the following functions and features.

- (2) The control circuit shall include a 120 volt to 24 volt transformer with a secondary fuse to provide a low voltage source for the regulator floats that sense the wet well level for pump operation. Terminal blocks shall be provided to connect each regulator float switch to the control circuitry. Each relay must operate in response to a specific regulator float in respect to the wet well level with the relay energizing when the normally open float closes. Control relays, with 24 volt operating coils, shall interface between the floats and the pump starters and alarm functions.

C. Alarm Systems

- (1) Each of the following alarm functions shall be included in the panel to continually monitor the specific condition for which it is intended and provide the indication and response described. The indicator pilot lights for all alarms shall be 120 volt with nameplates to identify each junction. These alarm functions are to protect the pumps and indicate abnormal conditions of the system.

- (2) Alarm Light:

The exterior panel mounted alarm light shall be a weatherproof shatterproof red light fixture with a 40-watt bulb to indicate an alarm condition exists. The general alarm light

shall be turned on by any alarm function. An indicator pilot light on the inner door shall show which of the alarm conditions has caused the exterior general light to be turned on. The light shall turn off when the alarm condition is corrected and the alarm circuit is manually reset, if required.

- (3) Audible Alarm Horn:

The exterior panel mounted audible alarm horn shall be a weatherproof device to provide an audible signal to indicate an alarm condition exists. The alarm horn shall be a minimum of 80 decibels and be turned on by any alarm function that will turn on the exterior alarm light. Depressing the Alarm Silence pushbutton, located on the panel

exterior shall silence the audible alarm. The silence circuit shall automatically reset when the alarm condition is cleared.

(4) High Level Alarm:

The high alarm level regulator float switch shall close on a high wet well level condition. A High-Level Alarm relay and a red pilot light shall be provided to indicate the alarm condition. The general alarm shall turn on to indicate the alarm condition. The general alarm and high level pilot light shall automatically turn off when the high level condition has cleared.

(5) Pump Moisture Alarms:

- (a) Each pump shall be provided with a seal failure alarm relay and an amber pilot light to indicate the condition. The relay shall be a liquid sensing induction type relay and have a secondary circuit wired to terminals, for each pump, to be connected to the moisture sensing probe in each pump seal chamber. If probe senses moisture the seal failed relay shall turn on the Seal Failed alarm pilot light to indicate same.
- (b) The pump shall be taken out of service by the seal failed alarm and the general alarm shall indicate same. Immediate action must be taken for maintenance or replacement of the failed seal to place the pump back in service and reset the alarm.

(6) Motor Temperature Alarms - Auto Reset:

Each pump is to be provided with a thermal alarm relay and a red pilot light to indicate the condition. Terminal blocks shall be provided for connecting the normally closed thermal sensing contact located in each motor winding for motor thermal protection. An abnormal rise in motor winding temperature shall cause the thermal alarm relay to shutdown the pump motor and turn on the High Temperature red alarm pilot light and the general alarm to indicate same. The thermal alarm shall automatically reset and restore pump operation upon the thermal contact resetting when the thermal condition of the windings is back to normal due to the pump shutdown. The thermal alarm shall also reset after a power failure or if control power is interrupted for any reason.

(7) Telemetry **Shall Be DATAFlow**

D. Drawings and Markings

(1) Panel Marking

- (a) All component parts in the control panel shall be permanently marked and identified as they are indicated on the control drawings. Marking shall be on the backplate adjacent to the component.
- (b) All control panel conductors shall be permanently number marked with wire markers at each end as close as practical to the termination of the conductor.

(2) Nameplates

The panel shall include engraved nameplates on the inner door for all components to indicate the device function. The nameplates shall be permanently affixed with plated machine screws or a bonding adhesive suitable for the application. The material shall be white with a black core and have a minimum of 3/16" letters.

(3) Final Drawings

Upon completion of the panel a complete set of As Built drawings and Bill of Materials shall be supplied to the City. The drawings shall include a power and control schematic a terminal block diagram showing each remote connection to the panel. An adhesive mylar copy of the schematic drawings and terminal diagram must be permanently affixed to the inside of the control panel door.

E. Float Switches

Shall be "Roto-float" as manufactured by Anchor Scientific or approved equal.

5.7 Spare Parts

One complete set of mechanical seals shall be supplied for each pump bearing furnished. The spare parts for each control panel shall also include one complete spare relay with base, spring retaining clip, one spare phase monitor relay with base, if applicable, any applicable fuses and resistors, a spare main breaker and a spare secondary breaker.

5.8 Installation

A. Placement of Concrete

- (1) Forms for bottom slabs may be omitted when the soil and workmanship permit accurate excavation to size, and the omission has to be approved by the City.
- (2) Removal of forms shall be done in a manner, which will assure complete safety of the structure. In no case shall the supporting forms be removed until the members have acquired sufficient strength to support their weight and loads thereon safely.
- (3) All water and foreign matter shall be removed from forms and excavations. Unless otherwise directed, wood forms must be thoroughly wetted just prior to placing concrete.
- (4) Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re-handling of flowing. Conduits, sleeves, hangers and other work required to be built into concrete shall be inspected and approved by the City. No concrete that has been partially hardened becomes contaminated by foreign materials, or has been re-tempered, shall be used. Placement of concrete shall generally be carried on as a continuous operation until construction joints are necessary. Except for slabs on earth surfaces, concrete shall be placed with the aid of mechanical vibrating equipment.

Vibration shall be supplemented by forking or spading by hand adjacent to the forms on exposed faces in order to secure smooth, dense, even surfaces. The concrete shall be worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures. Light hammer tapping will be allowed at lift lines to prevent air bubbles.

(5) Curing.

Finished concrete shall be kept damp continuously for one (1) week after it has been poured, or some acceptable curing compound shall be used as directed by the manufacturer. All concrete shall be used as directed by the manufacturer. All concrete shall be adequately protected from injurious action by the sun, heavy rains, flowing water and mechanical injury.

B. Top Slab

(1) Flood Plain:

In area with high water tables, pump stations are designed to withstand flotation forces when empty. When setting the pump station, the design considers the potential for damage or interruption of operation because of flooding. Pump station structures and electrical and mechanical equipment are designed to be protected from physical damage by the 100-year flood. Pump stations are designed to remain fully operational and accessible during the 25-year flood unless lesser flood levels are appropriate based on local considerations, but not less than the 10-year flood. [62-604.400(2) (e), F.A.C]

(2) Size of top slab shall be as shown on the City's standard details.

(3) Top slab shall be level. Consult manufacturer's individual access cover drawing before installation of access cover.

C. Automatic Discharge Connection

The automatic discharge connection shall be attached to the bottom slab level and at the exact location required relative to the access cover.

D. Internal Piping and Manifold

Use proper gaskets, tighten bolts gradually and evenly. On all lift stations deeper than 15 feet, install discharge pipe brackets to relieve discharge connections from overload and intermediate guide bar brackets to prevent guide bars from bending when pumps are pulled.

E. Installation of Pumps

Contractor shall install pumps with City representative present. Lower pump units into place along guide bars. Check visually contact between volute flange and discharge connection. If necessary, recheck and re-align discharge connection(s) and guide bars with pumps in place.

F. Grouting

After proper alignment of all components is established, grout access cover, discharge

connection(s) and pipe thru-lets. Build up and shape slopes at pump bottom in accordance with drawing. Use top quality grout only (Meadow-Sealtight V-4 Non-Metallic or equal).

5.9 Warranty

All pumping stations and site restoration shall be fully guaranteed against material defects of improper workmanship for a period of one year from acceptance by the City. During this time, repairs will be made by the developer at no cost to the City. Any repairs made on the newly installed system by the City during this period will be charged to the developer.