

GAZİMAĞUSA
BELEDİYESİ

FAMAGUSTA
MUNICIPALITY



ATIKSU TERFİ İSTASYONU VE
BASINÇLI HATLAR İÇİN
TEKNİK ŞARTLAR

TECHNICAL SPECIFICATIONS
FOR PUMPING STATIONS AND
PRESSURE MAIN PIPELINES

İçindekiler / Table of Contents

Specifications for wastewater pumping station and pressure main pipelines	4
1. General specifications for pumping stations	4
2. Civil works.....	5
Specifications for underground structures.....	5
Specifications for pipe laying, excavations and backfilling	6
3. Mechanical works.....	6
Check valves.....	7
Gate valves	7
Penstock	7
Dismantling joint.....	7
Air valves.....	7
4. Electrical and electronic works	8
Pumps.....	8
Automation and Control.....	8
Radar water level sensor	10
Wastewater level switches	10
Standby generator set	11
Earthing system.....	11
5. Documentation, testing and training on completion	11
Documentation	11
Water tightness test for main pressure pipe.....	12
Water tightness test for wet well	12
Pump operation test	12
Main power failure (generator) test.....	12
Operation and Training.....	12

Abbreviations

CS	Carbon Steel
DN	Diameter Nominal [mm]
EC	European Commission
EU	European Union
GGG	Ductile cast iron
GRP	Glass-fibre reinforced plastic
HDPE	High density polyethylene
PN	Pressure nominal
SDR	Standard diameter ratio
PS	Pumping station
PVC	Polyvinyl Chloride
SN	Nominal stiffness
SW	Sewer Network
WWTP	Wastewater Treatment Plant
KIBTEK	Turkish Cypriot Electricity Authority

Specifications for wastewater pumping station and pressure main pipelines

1. General specifications for pumping stations

The pumping station design shall comply with the general specifications and design principles shown below:

1. The Pumping Station shall have two pumps, circular wet well and a separate service chamber for maintenance of gate valves and check valves.
2. A conceptual design is prepared. The Contractor is responsible to prepare a detailed design with architectural, structural, electrical and mechanical drawings, obtain all local permits, certificates and design visas. The Contractor shall submit a list of equipment, materials and design drawings to the Employer for approval prior to placing the orders.
3. Installation shall be in the sideway with no traffic load. Proper access shall be provided. The exact location of the pumping station, switch cabinet, and generator shall be indicated by the Employer.
4. The pumping station shall consist of the wet well, service (valve) chamber, PLC cabinet, generator set, and KIBTEK meter box.
5. The pumping station shall comply with European norms, Machine Directive and all parts shall bear CE certificate.
6. The pumping station shall have no screens for solids removal from wastewater.
7. Wet well made of glass fiber reinforced polymer. The wet well shall be water tight (see Section 5). The material of the complete station shall be applicable for municipal and industrial waste water with a pH value from 5.5 to 8.5.
8. The pumping station bottom shall be self-cleaning by having sloping walls and a reduced floor area which forces all solids typically found in waste water to the suction of the submersible pumps.
9. The HDPE inlet sewer pipe shall be joined to the wet well wall, sealed and watertight.
10. The wet well shall have a vent pipe with carbon cartridges for odour removal. The vent pipe height shall be minimum 2 metres outside of the wet well. The vent pipe sections outside of the wet well shall be stainless steel EN 1.4404 (AISI 316L).
11. The service chamber shall have one vent pipe to prevent condensation inside the chamber. The vent pipe shall be made of galvanised carbon steel to be painted with metal paint.
12. Service chamber shall have an access cover and ladder. The access ladder shall have fall protection cage.
13. The Contractor shall provide a warranty for the whole of the pumping. Wastewater conductivity is ranged between 500 and 5,000 $\mu\text{S}/\text{cm}$.
14. Switch cabinet, generator, KIBTEK meter box, wet well cover and service chamber cover shall have health and safety warning signs made of weatherproof PVC or stainless steel plates.
15. The pump station shall be fenced. Fencing shall encompass the wet well, service chamber, switch cabinet and generator set. KIBTEK meter box shall be placed outside of the fenced area.
16. All costs associated with testing of the pumping station and main pressure pipe shall be covered by the Contractor. All costs associated with operational training of the pumping station shall be covered by the Contractor.

2. Civil works

Specifications for underground structures

17. The wet well and service chamber shall be placed over 25 cm thick steel reinforced concrete underground base slab.
18. The wet well and service chamber shall have placed under 25 cm thick steel reinforced concrete top slab at ground level.
19. The switch cabinet and the generator shall be placed over 25 cm thick steel reinforced concrete base slab at ground level.
20. All reinforcement for concrete chambers, top slabs and base slabs shall be made of $\varnothing 18$ mm carbon steel at every 200mm each way and each face of the concrete.
21. The minimum class of the concrete shall be C 25/30.
22. All HDPE structures and pipes shall be PE100.
23. The wet well and service chamber shall have covers made of stainless steel EN 1.4404 (AISI 316L) or GRP compliant to EN124 for easy removal of pumps and provide access for maintenance with minimum surface area of 150 x 80 cm's or bigger. The stainless steel covers shall have load bearing capacity of minimum 500 kg's. The GRP covers shall have safety grit divided in 2 parts with load bearing capacity of minimum 500 kg's. The covers shall be equipped with handles and safety padlocks. A handy lifting tool shall be provided for stainless steel covers.
24. All concrete chambers shall be equipped with steps and fall protection cage as indicated in drawings or as directed by the Employer. Steps shall be black carbon steel.
25. All black carbon steel structures shall be painted with Hammerite metal paint.
26. All cables shall run through PVC underground pipes. The cable pipes shall be approximately 0.8 m below the ground surface, bedded in sand and covered by lean concrete.
27. Reinforced concrete chambers shall be located as indicated on Drawings or directed by the Employer.
28. All concrete chambers shall have sumps or proper slopes allowing accumulation of water and extraction with a portable mono-phase pump.
29. All concrete chambers shall be coated externally and internally. External and internal coating shall consist of two layers of bitumen based coating. The coating shall cover all internal and external surfaces of the man-holes, including floor, walls and top slab. Concrete surfaces shall be cleaned and the coating shall be applied in accordance with the instructions of the manufacturer of the coating material.
30. Concrete chambers in traffic shall have cast iron covers and frames that meet the requirements specified in EN 124. Covers shall be equipped with covers and frames designed for 40 tons (D400). All covers shall be with anti-theft protection, shall be watertight and tight fitting on frames so as not to vibrate under passing traffic.
31. Concrete cement shall be sulphate-resisting Portland cement, class CEM I 42.5 R.
32. All concrete chambers shall be of impermeable concrete according to DIN1045. Cracks shall not be allowed.
33. Concrete surfaces shall be perfectly compacted, smooth and with no irregularities, free from fins, bulges, ridges, offsets, honeycombing or roughness of any kind.
34. HDPE pipe - wall intrusions shall have puddle flanged fittings. A single flanged type may be used for concrete wall intrusions. Where single-flanged type is used it shall be positioned so that the puddle flange is in the centre of the reinforced concrete wall. Where

double-flanged type is used it shall be positioned so that the outside face of each flange is flush with the face of the wall.

Specifications for pipe laying, excavations and backfilling

35. Underground pipelines shall run along and cross roads and footpaths, where shown on the Drawings and approved by the Employer. The surface of the roadways or the surface of the footpaths shall be reinstated in accordance with the existing conditions.
36. Pressure main pipe route shall be specified and clearly marked before starting excavation.
37. Thrust blocks shall be provided at bends (both horizontal and vertical), branches and blank ends on jointed pressure pipelines outside of the wet well.
38. Backfilling shall not be carried out without the prior approval of the Employer.
39. The width of the excavated pits for concrete chambers and wet well shall be the minimum of chamber external diameter plus 350 mm on each side to allow for the correct compaction of the side fill. The backfill materials shall be placed in layers, not exceeding 30 cm in depth before compaction and shall be well compacted.
40. The width of the excavated pits for HDPE pipes shall be the minimum of pipe diameter plus 150 mm on each side to allow for the correct compaction of the side fill.
41. Sand shall be the bedding and initial backfill material for underground HDPE pipes. Sand shall be fine granular material, of granular non-cohesive nature or fine aggregate, of which at least 90% by mass passes through a sieve having 4.8 mm square openings. The sand shall be free of large objects, rubble or other undesirable materials.
42. 150mm sand shall be used as bedding for the HDPE pipes. Sand shall be levelled and compacted before pipe laying.
43. The HDPE pipes in trenches shall be completely covered with sand minimum 150 mm above the pipe crown.
44. For marking underground HDPE pipes, plastic tapes of a bright green colour and of a width of at least 40mm shall be laid on the initial backfill.
45. After initial backfilling and compaction, main backfilling shall presume. Unsuitable materials for backfilling are materials from swamps, marshes and bogs, vegetable matter, timber or similar materials liable to decomposition, materials susceptible to spontaneous combustion, clay or soil having excess liquid content. In the case of high groundwater presence, the main backfill material shall also be sand or gravel exceeding the level of groundwater.
46. Main backfilling around all structures shall be done with selected material from the excavation. The material must be compacted in layers not exceeding 30 cm. Compaction shall be such as to reach 95% Standard Proctor Density.
47. Backfilling will be completed when the trench excavation has been filled to about 100 mm over natural ground level to allow for settlement. All excess material shall be transported to a disposal area to be approved by the Employer.
48. Contractor shall repair and/or construct all nearby pavements and access road as a part of the work in accordance with existing pavement structure.
49. The pipes crossing riverbeds and creeks shall be laid over at least 15cm C10 concrete bedding and with at least 15cm C30 concrete cover and surround measured from the pipe crown.

3. Mechanical works

50. The wet well shall have 2 pump discharge connections DN 100/150 and a DN150/200 main collector made of stainless steel EN 1.4404 (AISI 316L). All stainless steel pipes shall be welded at the factory and delivered to the site in pre-welded condition. All other pipe sections and joints will be flanged. All screws and bolts to be made of Stainless steel AISI 316L.
51. All HDPE pressure pipes shall be black coloured PE100 PN 10/16. All HDPE pressure pipes shall be butt welded. All welding works shall only be carried out by personnel with qualifications according to the standards EN 805 and EN 12201.
52. The pump discharge pipes shall be operated with a gate valve and a check valve.
53. All pipes shall have minimum 50 cm clearance above the service chamber base for easy removal, operation and maintenance of the valves.
54. The service chamber shall have a sump and a HDPE DN80 drainage pipe in the bottom which leads any liquid in the chamber back to the wet well.

Check valves

55. Self-cleaning construction, wastewater grade, eliminating the risk of impurities causing blockage.
56. Bolts and nuts of stainless steel EN 1.4404 (AISI 316L) or higher grade and body and cover of ductile iron with epoxy coating internally and externally.
57. Standard flange drilling to EN1092-2 (ISO 7005-2), PN 10/16

Gate valves

58. Stainless steel stem with wedge stop and rolled threads for high strength
59. Full circle thrust collar provides fixation of the stem and low free running torques
60. Stem sealing with an NBR wiper ring, a polyamide bearing with NBR O-rings, and NBR rubber machete
61. Round NBR bonnet gasket fixed in a recess
62. Countersunk and sealed stainless steel bonnet bolts encircled by the bonnet gasket
63. Epoxy coating to DIN 30677-2
64. Bolts and nuts of stainless steel EN 1.4404 (AISI 316L) or higher grade
65. Flange dimensions acc. to DIN EN 1092-2, PN 10/16

Penstock

66. All parts made of stainless steel EN 1.4404 (AISI 316L) or higher grade to be absolute corrosion resistance
67. Full circumferential sealing
68. Circular opening fitting to the inlet pipe
69. EPDM seals
70. Upward opening
71. Non rising stem
72. Stem extension to ground level

- 73. Wall guides
- 74. Fixed on the wet well wall with chemical anchor bolts
- 75. Hand wheel to be operated at ground level

Dismantling joint

- 76. Standard flange drilling to EN1092-2 (ISO 7005-2), PN 10/16
- 77. Epoxy coating to DIN 30677-2
- 78. Studs, nuts and tie-rods made of corrosion resistant stainless steel EN 1.4404 (AISI 316L) or higher grade

Air valves

- 79. Suitable for use with wastewater, brine and sludge
- 80. Corrosion resistant, stainless steel body
- 81. With isolating gate valve
- 82. PN 10/16, 0.1 Bar sealing pressure
- 83. DN 80 – 200

4. Electrical and electronic works

Pumps

- 84. The pumps shall be submersible sewage pumps without macerator or shredder.
- 85. Wet well installation shall be semi-permanent with stainless steel EN 1.4404 (AISI 316L) guide rails.
- 86. Single-stage close-coupled submersible centrifugal pump with semi open multi vane impeller designed to transport wastewater with fibrous materials and heavy sludge. The impeller blades shall be self-cleaning upon each rotation as they pass across a sharp relief groove in the Insert ring and shall keep the impeller blades clear of debris. The pump housing shall be prepared for the assembling of a flush valve. The pump motor shall be induction type with a squirrel cage rotor, housed in an air filled watertight chamber submersible up to 20m according IEC 60034 protection class IP 68. The stator windings and stator leads shall be insulated with moisture resistant Class H insulation rated for 180 degree C (355 degree F). The stator shall be heat-shrink fitted into the stator housing. The motor shall be sufficiently cooled by the surrounding liquid or by a cooling jacket filled with a Monopropylene glycol/water mixture to run in continuous duty S1 without limitation. Motor, pump and drive shall be designed and produced by the same manufacturer.
- 87. The cable entry shall consist of dual cylindrical elastomer sleeves, flanked by washers, all having a close tolerance fit against the cable and the cable entry. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable. The shaft shall be sealed by a tandem mechanical shaft seal system consisting of two seals, each having an independent spring system. The seals shall require neither maintenance nor adjustment and shall be capable of operating in either clockwise or counter clockwise direction of rotation without damage or loss of seal function.
- 88. Materials of construction;
Pump housing: EN-GJL 250

Impeller: EN-GJL 250 with hardened leading edges
 Insert ring: EN-GJL 250
 Stator housing: EN-GJL 250
 Shaft: 1.4057 or AISI 431
 Shaft seal:
 - Pump side: Corrosion resistant Tungsten carbide WCCR
 - Motor side: Corrosion resistant Tungsten carbide WCCR

89. All castings must be blasted before coating. All wet surfaces are to be coated with two-pack oxyrane ester Duasolid 50. The total layer thickness should be at least 120 microns. Zinc dust primer shall not be used.
90. The motor shall be protected and monitored by 3 bi-metal thermal switches for thermal control of the stator and 1 sensor to monitor leakage in the stator housing.
91. The pumps shall be tested in the factory prior to shipment. There shall be minimum 3-point hydraulic performance test, no leak seal integrity test, electricity integrity test.
92. The pumps shall be explosion approved acc. EExdIIB T3
93. The pumps shall have lifting chains and lifting mechanisms.
94. Rated voltage shall be 400 VAC
95. 3 Phase, 4 poles
96. Frequency: 50 Hz

Automation and Control

97. The Contractor shall connect the station to the network of the local electric supply company KIBTEK with Earthing system.. The Contractor shall supply, install and commission all electrical and electronic equipment and software.
98. The automatic control system will be equipped properly for integration (ready to be programmed) into the Employers central SCADA. The control system shall include a complete PLC; CPU, I/O modules, variable frequency drives, overload relays, HMI, Telemetry GSM communication Modem, etc.
99. Each pump shall be equipped with a frequency drive unit sized to match the submersible electric motor and designed for a power supply from 230-480V at 50 Hz 3 phase. The pump drive shall provide all level control functionality, hand/auto operation, pump alternation, pump over temperature monitoring, seal leakage monitoring, pump self-cleaning, sump cleaning and pipe cleaning algorithms. The pump drive shall also include capability to monitor station inflow, pump speed and energy consumption in order to automatically operate the pump station at optimal energy efficiency. One Pump drive per pump should be used to allow full redundancy and alternation. It shall be tested and approved in accordance with international standards, the European safety directive 98/37/EC, the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC and in accordance with the European standards: EN 61800-5-1:2003; EN 61800-3; EN 55011:2007; EN60529 and EN 60204-1. It shall be freestanding for wall mounting or cabinet installation construction and equipped with a ventilated system. Without any limitation or derating it shall operate in ambient temperature of up to 50°C.
100. To enable the operator to control the pump station as a substation of a pump station system it shall be equipped with a telemetry unit. The hardware and software of this unit shall be a standard product from the supplier, specially designed for pumping applications. The unit shall supply multiple protocols including AquaCom, ModBus and Comli. All measured values, commands and operating data shall be able to read and modified locally or remotely. The hardware shall include
 - Power supply 24 VDC +/-20 %; 400 mA max.

- 12 DigitalInputs(DI), separately isolated
 - 8 DigitalOutputs(DO)(6 relay outputs and 2 transistor outputs)
 - 3 AnalogInput(AI), separate isolated
 - Field bus connection for connecting external flow meter
 - USB connector
 - Wi-Fi access
 - Integrated GSM / GPRS modem
101. The HMI interface hardware must have at least the following properties:
- Screen size7.4 " 800 x 480 Pixel
 - TFT-LCD Touch Display
 - Applicationtemperaturerange-20 /+50C
 - 1xCAN Bus ports for RS 485
 - 1xserial port
 - 1xEthernetconnection
 - 1xUSB port
 - 1xUSB Mini
 - 1xSD card reader
 - 1xAudio Output
 - In a radius up to 20m it shall be possible to connect a computer via a Wi-Fi to the telemetry unit.
102. The outer casing of the telemetry unit shall be made of aluminium and be isolated according protection class IP 66. The supplier shall offer an APP free of charge for Windows, Android or IOS system.
103. The pump drive shall provide alarms and monitoring for the drive, pump and sump. Alarms shall be presented on the LCD display, via a Summary Alarm relay and via Modbus registers. All alarms, when occurring, shall remain active until reset. Alarms shall have a built-in 4 second delay to prevent nuisance tripping. Alarms shall be as follows:
- Motor Temperature too high
 - Leakage in stator housing
 - High sump Level (via float switch or transducer)
 - transducer sensor error (connection failure, faulty values)
 - overcurrent or overload trip
 - over- or under voltage
 - ambient or drive temperature too high
 - ambient temperature too low.
 - input phase loss
 - max torque exceeded
104. A GSM alarm system for overflow and dry running conditions shall be established.To do this level measurement system installed in the pumping stations shall be connected to a GSM data logger.
105. Both pumps shall be in operation in changing order for equal aging.
106. Both pumps shall be protected and operated additionally by one overflow and one dry run protection level switches.
107. Overflow protection shall put both pumps into operation.
108. Dry run protection shall take both pumps out of operation.
109. The switch cabinet shall have cover doors, lock security and a canopy for protection from rain and direct sunlight. The LCD touch screen control shall be placed indoor.
110. The switch cabinet shall be made of steel reinforced plastic or aluminum and it shall be prepared for an installation on a concrete floor. It shall be isolated according protection class IP 44.Switch cabinet shall be equipped with proper ventilation or cooling. It is reminded that, in Cyprus, ambient air temperature exceeds +40 C in summer season. The

cabinet shall have ventilation equipment to vent out the hot air generated by the frequency inverters.

111. The cabin shall have enough free space to accommodate a control system (inverter, etc.) for another (3rd) pump.
112. The switch cabinet shall have a LCD touch screen for operation control and information display. The touch screen software shall have both English and Turkish language user interface.
113. The switch cabinet shall have analog pump running hour count metres. The switch cabinet shall have a manual on-off switch for each pump. All buttons and switches shall have clear user friendly markings. The switch cabinet shall have an emergency shut-off switch.
114. Cables from water level sensor and level switches shall be installed on the wet well wall with supports and inside foam filled PVC or HDPE pipe to prevent corrosive fluids, such as H₂S gas, entering into the switch cabinet.
115. Pumps shall be protected by sensors and relays to prevent overheating in windings, leakage in the stator housing and water-in-oil.

Radar water level sensor

116. Converting the level-proportional data into a standardised signal 4 to 20 mA.
117. Consists of a stainless steel housing with mechanical protection IP 68
118. Operating temperature: -10°C to +70°C
119. Measuring range: 0 to 20m H₂O
120. Corrosion resistant
121. Sensor body made of stainless steel 1.4404 (AISI 316L)
122. Coming together with cable and cable hangers

Wastewater level switches

123. Materials: Body made of polypropylene, Bending relief made of EPDM rubber, Cable made of special compound PVC & NBR/PVC
124. Operating temperature: 0°C to +60°C
125. Ingress protection: IP68
126. Applicable for liquids with a Density of 0.95 – 1.10g/cm³.
127. With cable hangers and submersible cable
128. Ex approved

Standby generator set

129. Emergency generator sets will be provided at each pumping station to supply power to the installation. The sets will be configured to automatically start in the event of a “mains” power supply failure and automatically shut down when the “mains” power supply is on.
130. The output from each generator will be fed onto a generator switchboard which in turn will supply the appropriate motor control centre. The generator switchboard and the pump control board will be installed in one common cabinet, integrated to the generator canopy.
131. The generator set-up shall prevent power escaping into the main grid during operation.

132. The control will be operated via a UPS battery backup. This allows automatic start-up of generator in absence of commercial power. Time delay relays shall prevent immediate re-start of the pumps.
133. Generator details according to General Technical Specifications and Data Table. Maximum noise level at a distance of 1 m must be < 73 dBA.
134. The generator shall have a diesel engine
135. The generator shall be suitable for installation in open space.
136. The fuel tank installed on the generator should be for at least 8h operation.
137. The Contractor shall indicate the type of generator in his proposal.
138. The generator is sized for operating both pumps.

Earthing system

139. Each switchgear, motor control centre and distribution panel in the unit controlling the whole operation area, shall be equipped with earthing rods, and the plant connected to them shall be effectively earthed.
140. Earthing continuity conductor to the main earthing rod shall be provided
141. The earthing network shall include earthing bars, earthing conductors and earth electrodes. All metal surfaces of the LV equipment shall be connected to the earthing rods
142. Resistivity tests shall be carried out at site in presence of the Employer's Representative to determine the number of earth electrodes in the network
143. Earthing resistivity for each electrode shall not exceed 2 ohm, and for the whole earthing system shall not exceed 1 ohm.

5. Documentation, testing and training on completion

Documentation

Upon completion of the works, the Contractor shall provide an Operation and Maintenance Manual in English and Turkish in three (3) hardcopies and in digital form (word, excel, pdf-format). The manuals need to be approved by the Employer. The Operation and Maintenance Manual shall include the following:

144. Warranty for the whole pumping station. The warranty shall run for 365 days starting on the day of Employer Training. The warranty shall cover all costs associated with corrosion of stainless steel and reinforced concrete structures, failure of electrical and electronic devices and defects that are not caused by standard operation or normal wear and tear.
145. Operational description and user's manual including details of system start-up/shut-down and alarm references, detailed description of hardware and PLC software and GSM communication system.
146. Pump specifications, catalogs, charts, operation& maintenance manual
147. Hydrostatic level sensor specifications, operation& maintenance manual
148. Level switches specifications, operation & maintenance manual
149. Suppliers specifications for gate valves, check valves, air release, dismantling joints, penstocks
150. Approved versions of electrical, mechanical, civil and architectural as-built drawings
151. Generator user operation and maintenance manual and warranties

152. Certificates for water tightness tests, drawdown and operation tests, and generator (main power off-on) test.

Water tightness test for main pressure pipe

The following method shall be implemented for main pressure pipe water tightness test;

153. During installation of the main pressure pipe, a water tightness test shall be implemented at every 500 metres.
154. The pipe shall be properly supported, not fully but sufficiently covered before starting test implementation.
155. The pipe section shall be filled with clean water for 24 hours. During testing, 10 bars of water pressure shall be applied for 24 hours.
156. The water tightness test shall be confirmed by the Employer if pressure drop is less than or equal to 0.1 kg/cm².

Water tightness test for wet well

The following method shall be implemented for wet well water tightness test

157. Flooding of the complete wet well with drinking/clean water prior to back-filling
158. Marking or measuring of the water level, accuracy of measurement +/- 1 mm
159. After one day the water level shall be checked and the walls shall be observed for wet spots.
160. The water tightness test shall be confirmed by the Employer if no significant drop of water level (< 2 mm) and the area of wet spots are reduced. Leakage shall not be allowed.

Pump operation test

Operation test shall be implemented:

161. Flooding of the complete wet well with drinking/clean water
162. Marking or measuring of the water level, accuracy of measurement +/- 1 mm
163. Starting pump and continuous operation until automatic pump stop.
164. Marking or measuring of the water level, accuracy of measurement +/- 1 mm

Main power failure (generator) test

Generator operation shall be tested by cutting mains power from KIBTEK switch.

Operation and Training

The Contractor shall provide a 30 day remote operational support and one full-day, on-site, hands-on training to the Employer's assigned operators. During the 30-day remote support period, the Contractor shall monitor the pump station and train the Employers Operator Staff. During the 30-day period, all operational costs, electricity energy, cleaning services, sanitation shall be provided by the Employer and the Employer's assigned staff shall operate the pump station as per instructions from the Contractor.