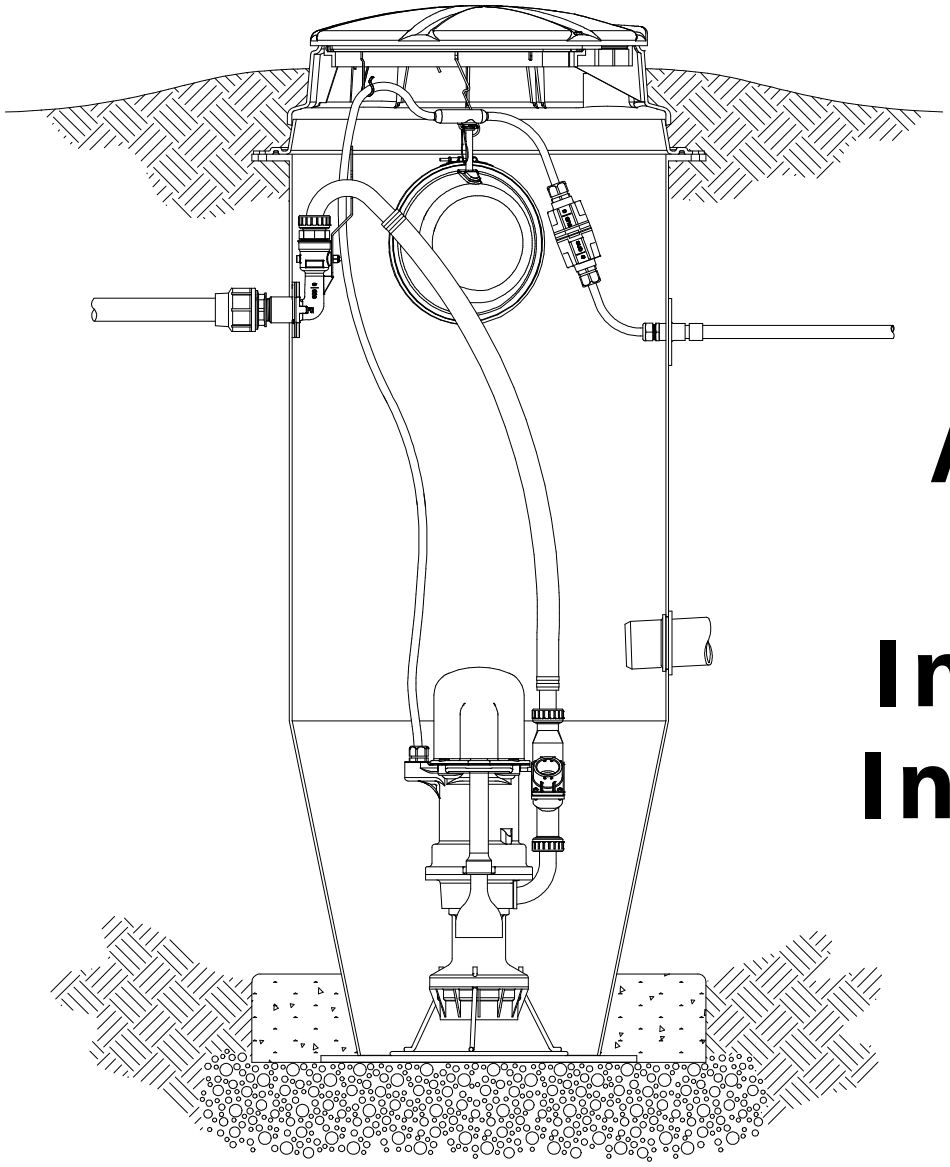
E/One Sewers ™



2010i

Australia Typical Installation Instructions

2010i Installation Instructions

The 2010i station is a well-engineered system designed to provide low-pressure sewer service to individual residences or buildings. Proper installation of this equipment will ensure years of trouble-free service.

This is a sewage handling pump and must be vented in accordance with national and local plumbing codes. This pump is not to be installed in locations classified as hazardous. All piping and electrical systems must be in compliance with applicable standards, local & national codes and to the satisfaction of relavent authorities.

PRODUCT DESCRIPTION

The 2010i station consists of a grinder pump, tank, pump control panel and connecting control/ power cable. The tank is a fiberglass basin complete with a gasket-sealed, fiberglass lid. Sewage enters the tank through the 100 mm DWV uPVC (110.2 mm OD) (standard) inlet pipe where it is ground into fine particles by the grinder pump. The in-line pumping mechanism discharges the macerated sewage to a pressure main, gravity main or a remote treatment site. The pump is a semi-positive displacement type capable of developing discharge pressures up to 45 m TDH. Ample tank storage capacity in conjunction with integral level sensing controls provides for economic, on-demand, operation of the grinder pump.

ITEMS REQUIRED FOR INSTALLATION

Prior to beginning installation of the 2010i station, a thorough review of these installation instructions is recommended. This will likely eliminate problems with inconvenient piping and cable locations or due to unavailable materials or equipment. In addition to the components furnished with each 2010i station, the following items will be needed to support installation:

- Electrical supply in accordance with the specification on the pump nameplate.
- Bedding material (see Section 2)
- Concrete ballast. (see Section 3.)
- 100 mm DWV uPVC (110.2 mm OD) inlet pipe (from residence or building sewer). (see Section 5)
- 1-1/4" BSP 40mm PN 16 PE discharge pipe to force or gravity main. (see Section 6.)
- Compactable backfill material (see Section 9).
- The following tools:
  - 127 mm (5") diameter hole saw
  - Pipe thread sealant (suitable for PVC)
  - Pipe wrenches
  - Electric drill
  - Common hand tools

INSTALLATION STEPS

The following instructions will provide the necessary information to properly install the 2010i station.

1. Station Unpacking

(Refer to Figure 1)

The station control panel, grinder pump and tank are shipped to the job site separately. Inspect the tank (1) and ensure that it sustained no damage during shipment. Proper handling of the

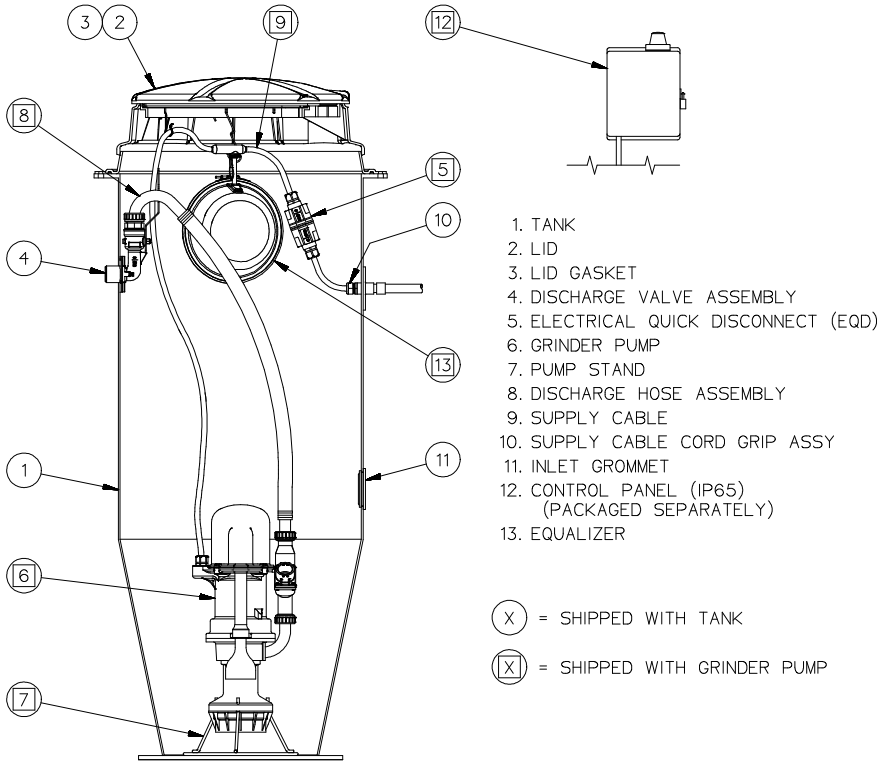


Fig. 1 - Station Components

fiberglass tank will ensure reliable performance. Do not drop the fiberglass tank or roll it on its side. Only a non-marring sling should be used to lift the fiberglass tank. Ensure that all lifting equipment is rated for the load being lifted. Remove the fiberglass tank lid (2) and verify that the supply cable cord grip (10) and the discharge valve (4) are installed in the tank. The inlet grommet (11) should be shipped, loose with the tank. The balance of the factory provided components were delivered with the grinder pump unit. Inspect the shipping cartons for signs of any damage sustained during shipment. If damage is suspected on any of the pump components, do not proceed with installation. Notify an Environment One representative of any damage discovered. Open the pump shipping carton(s) and verify that the grinder pump (6), pump stand (7), discharge hose assembly (8), equalizer (13), and supply cable (9) are enclosed. Open the control panel (12) shipping carton(s) and ensure that control panel has sustained no shipping damage. Notify an Environment One representative of any missing components.

2. Site Excavation

Excavate a hole of sufficient depth and width to accommodate the tank, underground piping and required backfill material as well as providing adequate working space for plumbing and electrical connections. The base of the excavated hole should be level and prepared with proper bedding material, such as gravel, in accordance with the site Engineer's requirements. The depth of the excavation must be sufficient to accommodate the bedding material and tank burial to the level indicated on the tank burial decal. The size, shape and shoring requirements of the excavation will be based on the soil conditions and should be in accordance with the site Engineer's recommendation and safety requirements.

3. Tank Installation

(Refer to Figure 2)

Improper handling of the fiberglass tank may result in damage and, ultimately, failure of the station. Care should be taken during lifting and placement to prevent impacting or otherwise damaging the tank. A non-marring sling should be used when lifting the tank by the fiberglass surfaces. Ensure that lifting sling is rated for the load being lifted. Lifting chains or cables should never be placed in direct contact with the fiberglass tank surfaces. Place the tank on the level bed of fill material in the excavated hole. Orient the installed discharge fitting, as required, to align it with the existing or proposed discharge piping path. Determine and mark the 100 mm DWV uPVC (110.2 mm OD) inlet pipe location on the fiberglass tank wall. The inlet pipe location corresponds with the actual or projected point where the 100 mm building sewer line intersects the tank wall. The center of the inlet

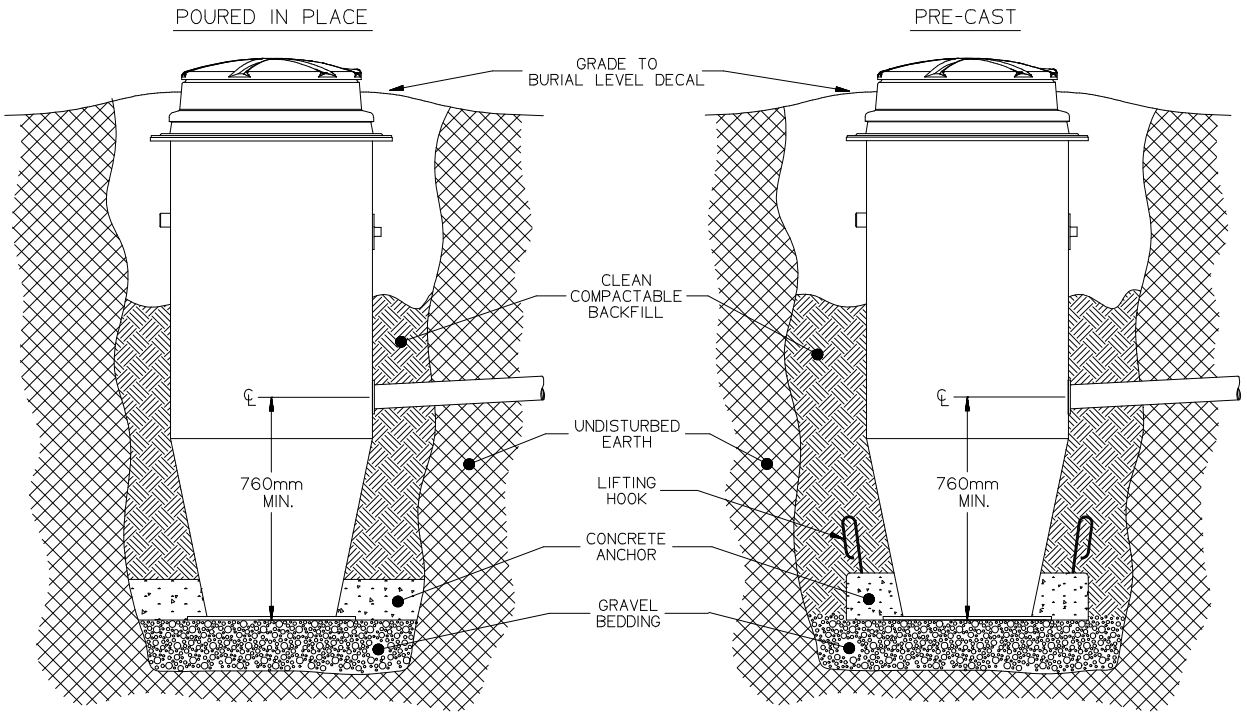


Fig. 2 - Tank Installation

pipe must be a minimum of 760 mm from bottom of the tank. The grade of the inlet pipe (per national and local code requirements) must be accounted for when determining the inlet location. The supply cable path should be considered when selecting the inlet location (see Section 8 and Figure 3). A concrete anchor is required to prevent flotation of the fiberglass tank when high groundwater is present. Ensure that the volume of concrete used complies with the site Engineer's requirements. Recommended ballast volumes are presented in Chart 1 of the Ballast Calculation sheet provided with this manual. Concrete ballast should be cast in place around the tank in the excavation. **Do not pour the concrete ballast above the marked inlet pipe location.** If the ballast must be poured above this level, proceed with installation of the inlet piping (see Section 5) before pouring the concrete. The inlet pipe must be sleeved with a 200 mm tube prior to pouring. The tank should be filled with water, to a level above the specified ballast height to prevent shifting during the concrete pour. Alternatively, precast concrete, around the tank bottom, may be used for ballast (see Fig. 2). Do not pour ballast above the intended inlet location. If this ballast method is used, lifting hooks must be anchored in the concrete to support subsequent handling of the tank. The lifting hooks must be adequate to support the combined weight of the tank and concrete ballast, and should be sized and installed in accordance with the site Engineer's recommendation. Place the ballasted tank in the excavated hole using the lifting hooks. **Do not lift the tank by any of the fiberglass surfaces if precast ballast is utilized.**

4. Venting

The 2010i station is a sewage handling pump and requires ventilation for proper and safe operation. The station is equipped with two vent stacks which are located beneath the removable fiberglass lid (refer to Fig. 3). The lid and seal are designed to allow continuous venting of the station.
Do not bury the 2010i station above the burial level line located on the side of the cover assembly. Burial above this level will result in blockage of the integral station vents. Additionally, if the water level outside of the station is expected to go beyond the surrounding grade (flooding) an alternative venting arrangement will be required. **Consult the factory if flood conditions are possible where the station is to be installed.**

5. Inlet Installaton

(Refer to Figure 4)

The station is supplied with a standard grommet to accept a 100 mm DWV uPVC (110.2 mm OD) sewer inlet pipe. The grommet is self-sealing and does not require the use of additional sealant or adhesives. Other grommet sizes are available upon request. Verify that the grommet supplied with the 2010i station will accommodate the selected inlet piping. Using a

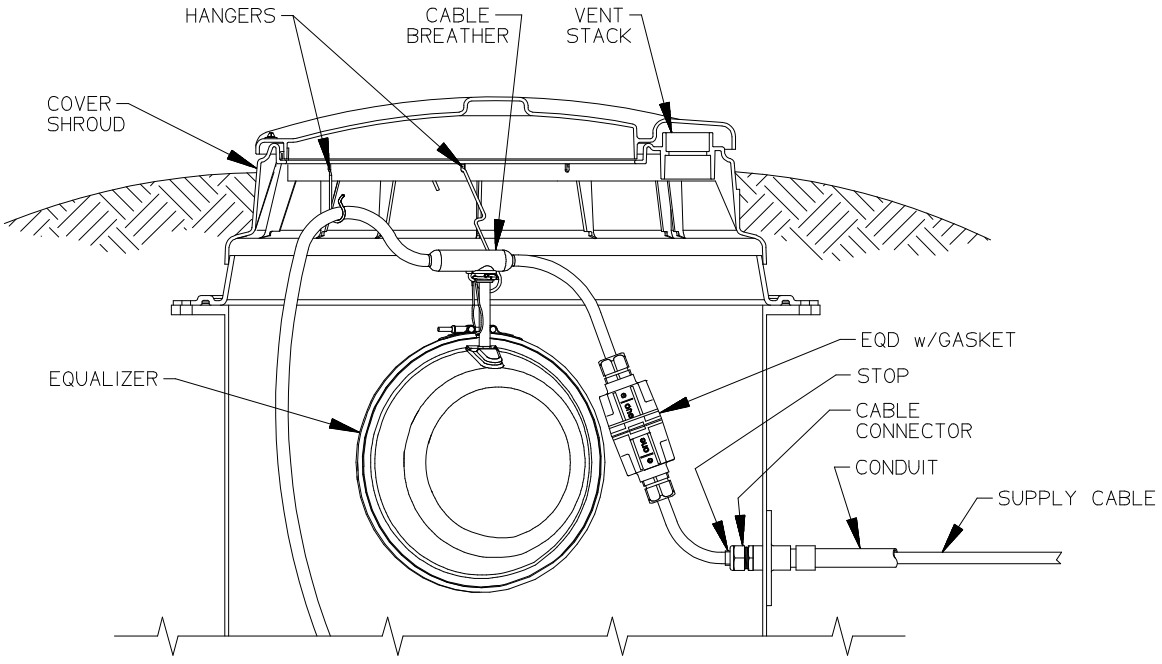


Fig. 3 - Venting & Electrical Connections

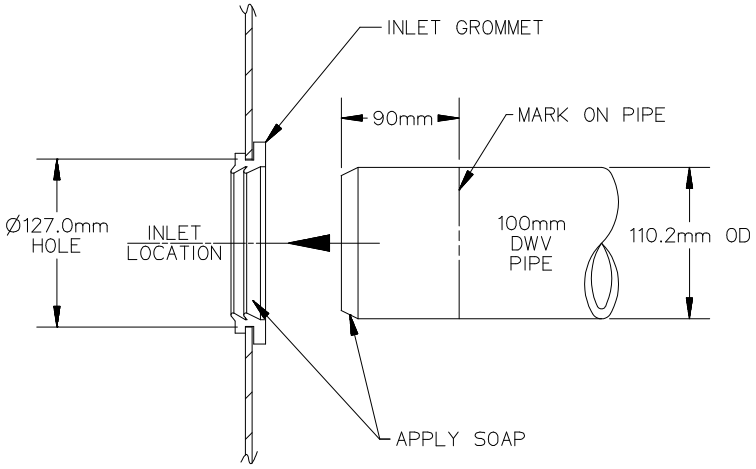


Fig. 4 - Inlet Installation

127.0 mm (5”) hole saw, drill through the fiberglass tank wall at the marked inlet location. Install the supplied inlet grommet in the drilled hole.

Place a mark on the inlet pipe 90 mm from the end that will enter the fiberglass tank. A bevel should be ground or filed on the pipe end to aid in installation through the grommet. Clean the grommet and pipe surfaces to remove any debris. Apply a film of pipe soap or dish soap to the outside surface of the inlet pipe end and the inside of the grommet. Insert the pipe end into the grommet and push the inlet pipe into the fiberglass tank until the 90 mm mark lines up with the grommet outside edge. Inspect the grommet flange on the outside of the tank. The flange should be flush against the tank wall and completely visible when the pipe and grommet are installed properly.

6. Tank Discharge Piping Connection

(Refer to Figure 6)

Connect the tank discharge piping to the threaded tank fitting. The 1-1/4” BSP female thread on the discharge fitting will accommodate a variety of pipe materials and fittings. Discharge piping must be selected in accordance with local and national plumbing codes. The use of PN16,PE100 solid black, 40mm OD polyethylene pipe is the preferred material. When using polyethylene pipe, electro-fusion type fittings should be used. . It is recommended that an Isolation Valve and a Redundant Check Valve Assembly (E/One part no. PB0104GXX) be installed between the pump discharge valve and the street main on all installations. Never use a ball type valve as a check valve. We recommend the valves be installed as close to the public right-of-way as possible. Check local codes for applicable requirements.

CAUTION:

Redundant check valves on station laterals and anti-siphon/check valve assemblies on the grinder pump cores should not be used as system isolation valves during line tests.

7. Control Panel Mounting

Before proceeding, verify that the supply voltage is the same as the

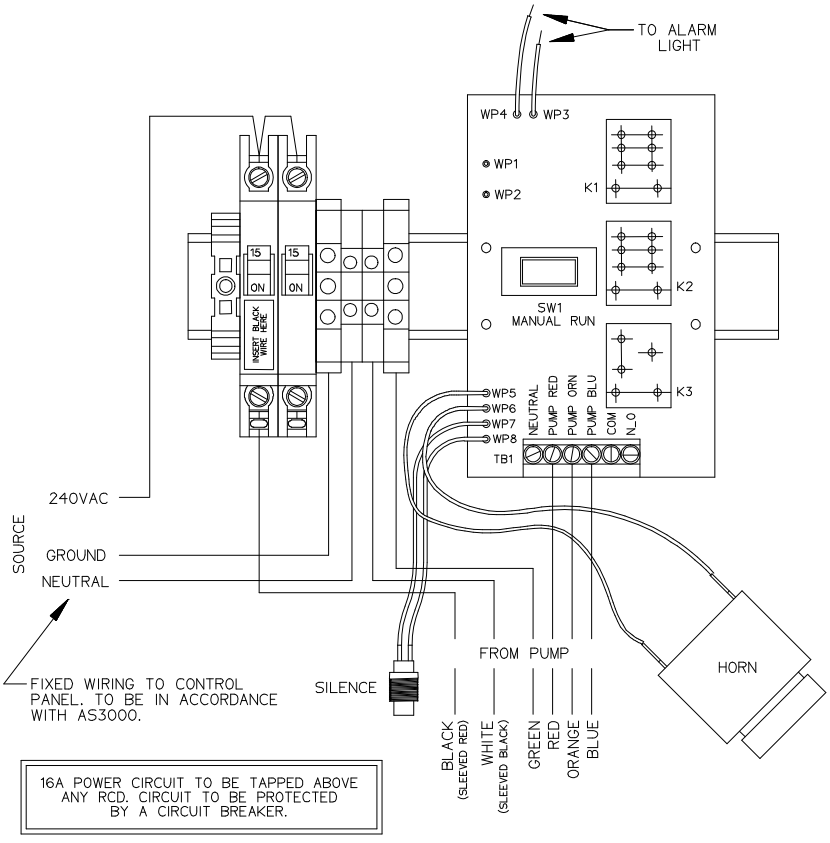


Fig. 5 - Control Panel Diagram

motor voltage shown on the grinder pump nameplate. Determine the location of the station control panel. The control panel may be mounted on a pole or directly on an outdoor wall surface. The mounting location selected must be visible from the grinder pump station location and provide general visibility to the occupants of the building. An alarm device is required on every installation. There shall be no exceptions. Mount the control panel to a wall or pole, securing it by mounting flanges with 4 screws. Any penetrations into the Environment One control panel shall be undertaken in such a way as to maintain the integrity of the IP rating (NEMA 4X, IP 65).

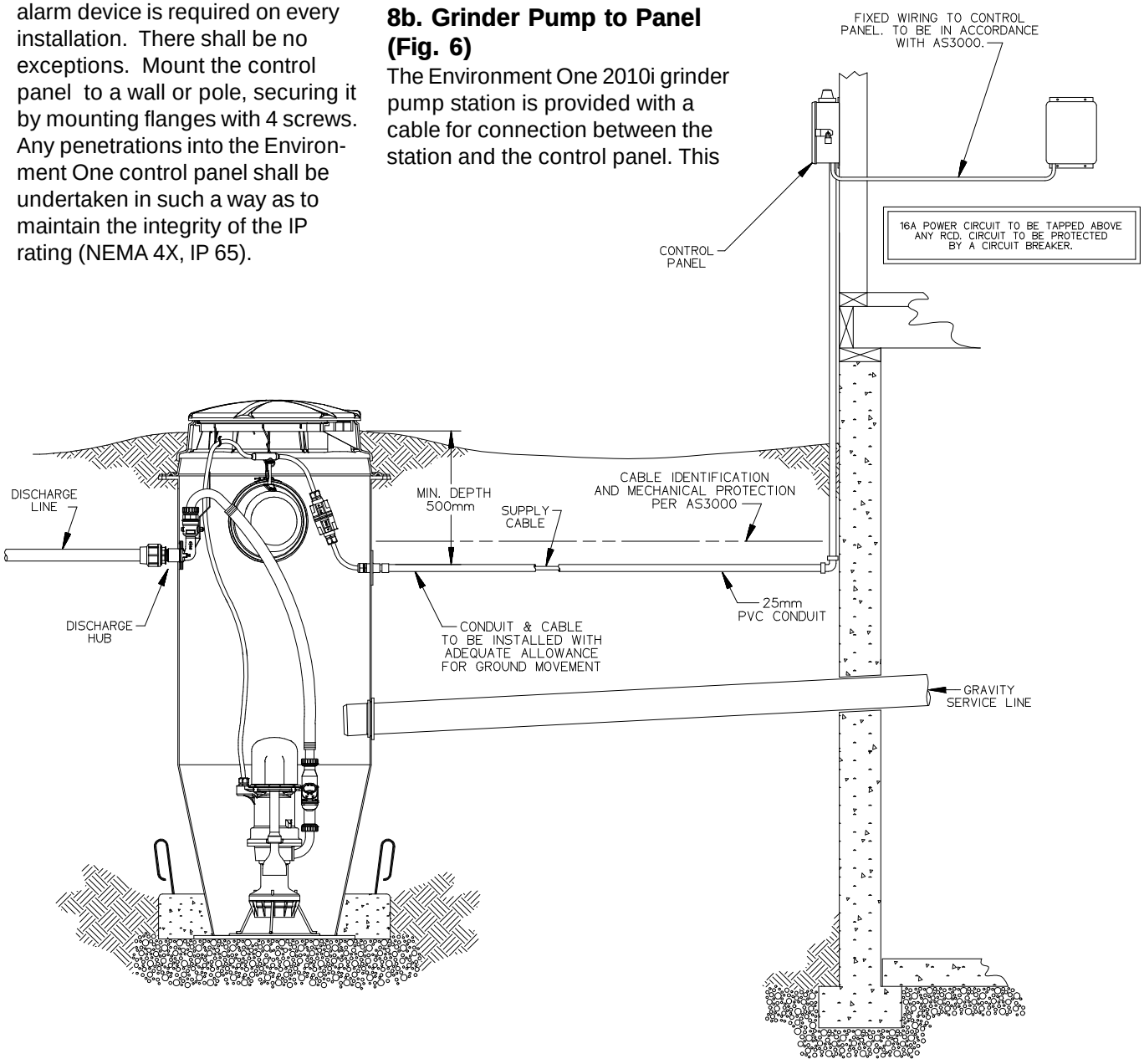
8. Electrical Connection

8a. Supply panel to E-ONE control panel

Wiring of supply panel and Environment One control panel shall be per figure 5, control panel wiring diagrams and in accordance with AS3000**.**

8b. Grinder Pump to Panel (Fig. 6)

The Environment One 2010i grinder pump station is provided with a cable for connection between the station and the control panel. This cable is referred to as the “supply cable”. The supply cable is shipped coiled, inside the grinder pump shipping carton. The supply cable, a six-conductor tray cable, may, under conditions outlined in AS3000, be directly buried. However, Environment One recommends the cable be located within a suitable conduit. Minimum



SUPPLY CABLE VOLTAGE DROP

240VAC PUMP = .308 VOLTS PER METER OF CABLE
(MAXIMUM RECOMMENDED LENGTH - 30.5 METERS)

Fig. 6 - Typical Station Installation

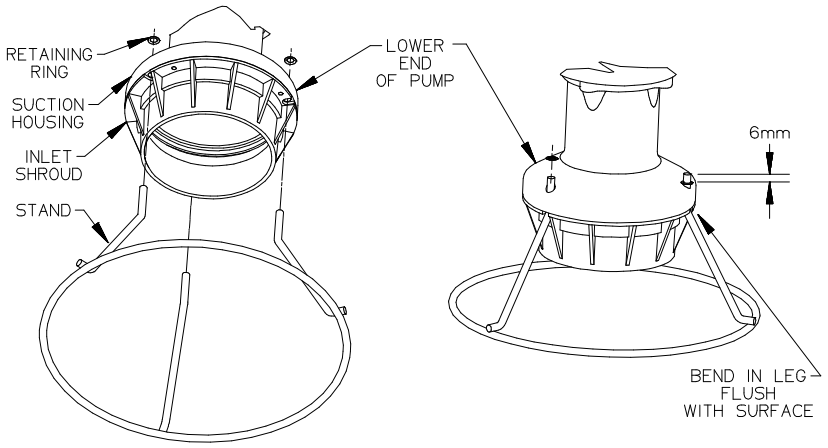


Fig. 7 - Pump Stand Installation

depth of the cable shall be 500mm. The cable must be provided with adequate mechanical protection and identification per AS3000. The cable and protection must be installed with adequate allowance for ground movement and expansion. *NOTE: Wiring must be installed in compliance with AS3000.*

8c. Procedure for installing E-ONE supply cable:

1) Open the lid of the station and locate the supply cable connector on the wall of the fiberglass tank. Loosen the nut on the connector and feed the free end (the end without the E/One EQD housing) of the supply cable through the connector from the inside of the station. Pull the supply cable out through the connector until it hits the crimped "stop" feature on the cable, approximately 610mm from the EQD housing.

****IMPORTANT:** *All but 610mm of the cable must be pulled out of the station, and the portion of the cable between the EQD and the molded in cable breather should be secured in position using the provided hangers to ensure that the pump functions properly (see Fig. 3).* ***Do <u>not</u> leave the excess cable in the station.***

2) Run the cable under-ground, in a trench or tunnel, in suitable conduit, per AS3000, to the location of the E-ONE panel. Use care when installing and burying the supply cable. If the cable is cut or otherwise damaged it may result in a pump malfunction. Connections made at the panel are shown in the panel wiring diagram (Fig. 5).

3) Retighten the supply cable connector nut. *This connection must be tight or ground water will enter the station.*

9. Tank Backfill

Proper backfill is essential to the long-term reliability of the 2010i grinder pump station. The choice of backfill material is dependent upon the local soil and groundwater conditions and must be in accordance with the site Engineer's requirements. The recommended method of backfilling is to surround the unit to the burial level (indicated on the cover shroud) with proper fill. The backfill material shall be to the satisfaction of the local relevant authority. Backfill shall be free of organic and compressible material and shall be free of voids and cavities. Compaction moisture content shall generally be 1% dry and 2% wet of the optimum content. Backfill shall be compacted to the minimum standard dry density ratios, AS1289, 95%. Non-compactable clays and silts are <u>not</u> suitable backfill for this or any underground structure such as inlet or discharge lines. If you are unsure of the consistency of the native soil, it is recommended that a geotechnical evaluation of the material be obtained before specifying backfill. Another option is the use of a flowable fill (i.e., low slump concrete). This is particularly attractive when installing grinder pump stations in augured holes where tight clearances make it difficult to assure proper backfilling and compaction with dry materials. Flowable fills should not be dropped with more than 1-1/4 meters between the discharge nozzle and the bottom of the hole since this can cause separation of the constituent materials.

10. Grinder Pump Stand Assembly

(Refer to Figure 7)

Detach the three stand retaining rings from the pump stand. Temporarily rest the grinder pump on its side. Using a block of wood or similar object, prop up the lower pump end to allow installation of the pump stand. Align the three legs of the pump stand with the three holes in the pump lower end. Push the stand legs into the pump lower end until the bend in each stand leg bottoms against the pump-housing surface. Turn the pump upright on the installed stand. Install one stand retaining ring on each of the three leg ends protruding through the pump lower end. The retaining rings are a pressure fit and are easily tapped in place using a 8mm socket or nut driver and mallet. The retaining rings should only be driven onto each leg approximately 6mm. Do not attempt to bottom the rings against the angled pump surface as this may distort the ring and lessen its holding power.

11. Grinder Pump Installation

(Refer to Figure 8)

Prior to installing the grinder pump in the tank, flush the inlet pipe with water to force any miscellaneous debris in the sewer line into the tank. Heavy debris such as sand, clay, etc. should be removed from the tank before installing the grinder pump.The grinder pump was supplied with all of the necessary plumbing components to connect the pump discharge to the tank discharge valve.

1. Ensure that one slip nut and one split ring are properly located behind the raised bead on each of the discharge hose.
2. Place one back-up ring and one O-ring on each end of the discharge hose assebly between the raised bead and the edge of the hose assembly. Note that the molded groove in the back-up ring is designed to be placed adjacent to the rubber O-ring.
3. Slide the straight, stainless steel end of the discharge hose assembly into the top of the check valve assembly on the grinder pump until the raised bead contacts the check valve housing. Both the O-ring and back-up ring should slide into the bore of the check valve housing. The hose should be oriented as shown in Figure 8 to support alignment with the station discharge valve.
4. Secure the hose assembly to the pump by tightening the slip nut onto the check valve housing. Overtightening the slip nut may damage the check valve. The slip nut should only be tightened to ¼ to ½ turn beyond hand-tight.
5. Using the pump lifting harness, lower the grinder pump into the tank until the pump stand rests on the bottom surface of the fiberglass tank. Orient the pump in the basin so that the curved end of the discharge hose is aligned with the discharge valve receiver.
6. Slide the curved, stainless steel end of the discharge hose assembly into the discharge valve receiver until the raised bead contacts the top of the valve receiver. Both the O-ring and back-up ring should slide into the bore of the valve receiver.
7. Secure the hose assembly to the discharge valve by tightening the slip nut onto the valve receiver. Do not overtighten the slip nut.
8. The valve handle should be left in the “OFF” (horizontal) position until system start up testing is conducted.

After completing the plumbing proceed with connecting the pump power cable. The grinder pump power cable is supplied with the mating half of the EQD connector. Verify that the EQD gasket is in place on the grinder pump power cord (see Fig. 3). Plug the pump power cable into the supply cable EQD connector. Note that the EQD halves are “keyed” and the plug connections can only be made one way. Align the clamping screws on the pump power cord EQD with the threaded holes on the supply cable EQD. Secure the EQD connection by tightening the two clamping screws until the EQD plastic “stops” are in contact with each other. Remove the plug from the Equalizer tube installed in the breather port and insert barbed fitting on the Equalizer. Using the provided hanging hooks, secure the Equalizer and supply cable to the cover shroud as shown in Figure 3.

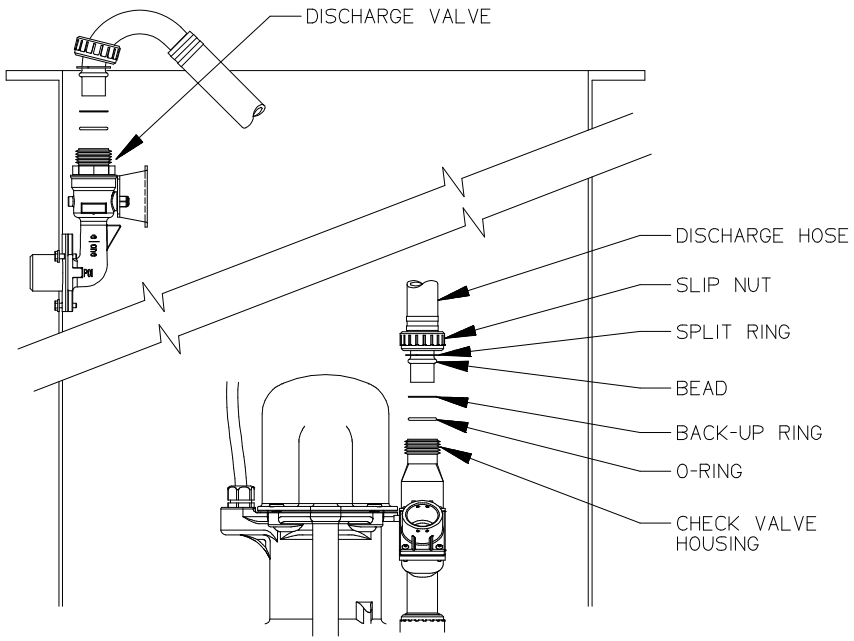


Fig. 8 - Grinder Pump Installation

12. Start-Up Test Procedure

When the system is completely installed, the station should be checked to ensure proper installation and reliable performance.

SYSTEM INSPECTION

Perform the following visual inspections:

- Proper burial depth - the tank should have been buried to the burial level indicator on the cover shroud.
- Proper grading - the surrounding soil should be graded down, away from the station.
- Station supply cable - the station supply cable must not be exposed outside of the station. Suitable conduit, per AS3000, should be used. Proper burial depth (500 mm) shall be maintained.
- Control panel - ensure that the control panel is properly mounted and free of any damage. Verify that the control panel has been wired properly in accordance with the wiring instructions in this manual.

ELECTRICAL TESTS

The following electrical tests are <u>recommended</u> prior to operating the grinder pump station. These tests require the use of appropriate electrical test equipment and should only be performed by qualified personnel trained in the safe operation of this equipment and electrical system servicing.

1. **Ensure that the electrical power supplying the control panel is "OFF".**
2. **Ensure that the grinder pump and alarm circuit breakers in the control panel are in the "OFF" position.**
3. Using a test (ohm) meter, set at a 2 meg ohm setting, measure the resistance between the colored wire pairs shown in Table 1. Resistance readings are to be taken in the control panel on the colored leads supplying the pump station (supply cable). Resistance readings other than those shown in Table 1 may indicate a problem with either the supply cable or the grinder pump. **If the measured readings are not as indicated in Table 1, do not proceed with station start-up; contact your Environment One or qualified service representative.**

TABLE 1

COLOR 1	COLOR 2	NORMAL READING
GREEN	BLACK SLEEVED RED	∞
GREEN	RED	∞
GREEN	WHITE SLEEVED BLACK	∞

(∞ = Infinity or open circuit)

4. Turn "ON" the power to the control panel from the building service panel.
5. Using a test (volt) meter, verify that the incoming panel voltage is within 10% of the pump nameplate voltage (for 240V pump, voltage at panel must be 216V to 264V). **If the voltage is outside of this range, do not continue with station start-up. The voltage problem must be corrected prior to proceeding.**

START-UP TEST

The following test <u>must</u> be performed prior to placing the system in service:

1. **Ensure all service and control panel breakers are in the "OFF" position.**
2. Open the discharge valve in the tank by swinging the valve handle to the "ON" (vertical) position.
3. Open any additional discharge lines. Some installations may have additional discharge line valves before entering the street main.
4. Turn "ON" power to the control panel, from the building service panel.
5. Set the alarm circuit breaker in the control panel to the "ON" position.
6. Fill the fiberglass tank with water until the red alarm light on the control panel is lit and the alarm buzzer sounds. Shut off the fill water.
7. Set the grinder pump circuit breaker in the control panel to the "ON" position. Once power is turned on to the grinder pump:

- The grinder pump should start immediately.
- The red alarm lamp and buzzer should switch off in approximately one minute.
- The pump should stop within approximately three minutes.

OPERATIONAL ELECTRICAL TEST

The following electrical test is <u>recommended</u> in conjunction with the Start-Up Test of the grinder pump station. This test requires the use of appropriate electrical test equipment and should only be performed by qualified personnel trained in the safe operation of this equipment and electrical system servicing.

1. The current to the grinder pump should be measured in the control panel, at the white wire (sleeved black) supplying the pump station (supply cable).

2. Using an ammeter, measure the current in the white wire (sleeved black) while the pump is operating.
3. The current should be between 5 amps and 8 amps.
4. Higher amperage indicates higher discharge pressure. Measured current in excess of 8 amps could indicate a blocked or closed discharge line. Correct any blockage problems and confirm that the current is within the acceptable range. **If the current remains outside of the acceptable range, and no discharge blockage is detected, contact your local Environment One or qualified service representative.**

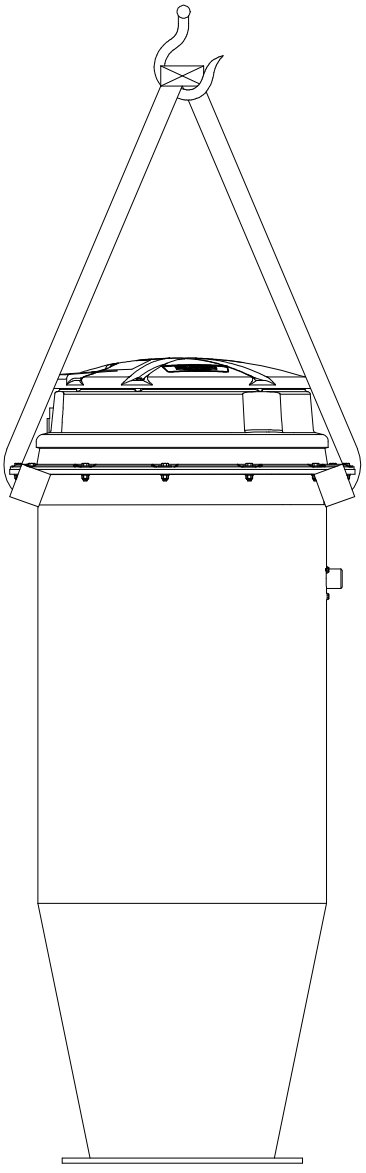
Lifting Instructions

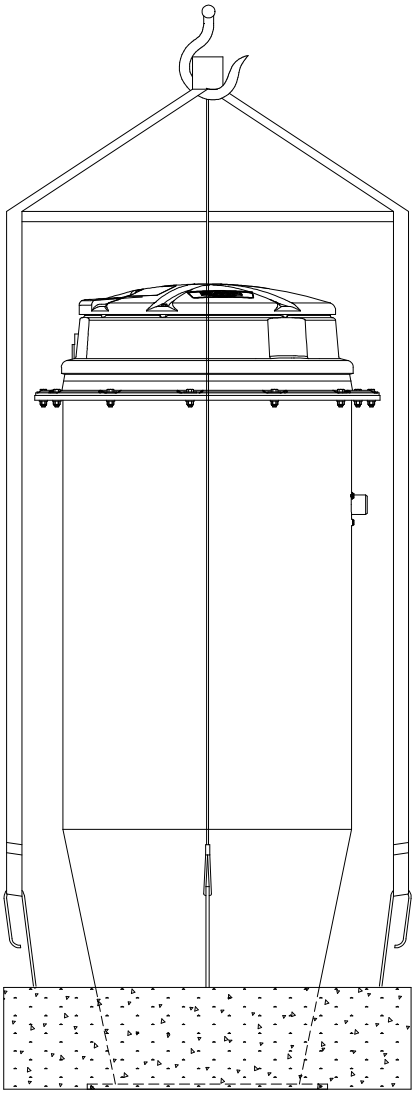
FAILURE TO FOLLOW THESE INSTRUCTIONS COMPLETELY WILL VOID WARRANTY.

1. Transporting unit to installation site:
If the station has been shipped secured to a pallet, lift the unit from the bottom during transportation. Alternatively, lift the unit using 2 nylon straps wrapped around the tank exterior, just below the cover flange as shown below. **Never roll a station or move it on its side.**

2. No Ballast, (to be poured in place):
If the concrete anchor is to be poured while the station is in place lift the unit using 2 nylon straps wrapped around the tank exterior just below the cover flange, as shown below. Keep station oriented vertically to avoid any damage.

3. Precast Ballast:
Never lift a station that has ballast attached by any means except the lifting hooks. The weight of the concrete will damage the station if you attempt to lift it from any part of the station.





E/One Series 2010i Grinder Pump Station
Ballast Calculations

A ballast, or concrete anchor, of proper volume and weight is required on most in-ground installations. The following section explains how to arrive at the correct size ballast. The amount of ballast needed is equal to the weight it would take to counterbalance the buoyant force exerted on a fully submerged station.

Installation Site Assumptions

1. Water table – under worst case, the ground water level is assumed to be at the finished grade level.

2. Backfill materials are per E/One Installation Instructions (Models 2010i & 2014i).

3. The consulting engineer should perform a soil test to determine if the assumptions that have been made are valid for the specific installation site. If the site conditions differ from these assumptions, then the consulting engineer may revise the calculations as shown in this document.

Physical Constants

1. Density of Water = 1000 kg/m^3
2. Density of Concrete (in air) = 2400 kg/m^3
3. Density of Concrete (in water) = 1402 kg/m^3
4. Density of Saturated Backfill = 1120 kg/m^3

Procedure

A. Determine The Buoyant Force Exerted On The Station

1. Determine the buoyant force that acts on the grinder pump station when it is submerged in water.
2. Subtract the weight of the tank from the buoyant force due to the submerged tank to determine the net buoyant force acting on the station.

B. Determine The Ballast Force Exerted On The Station

1. Determine the ballast force applied to the station from the concrete and saturated soil surrounding the station.

C. Subtract The Ballast Force From the Buoyant Force.

1. Note – if the installation site conditions are different from those listed above, the consulting engineer should recalculate the concrete ballast.

Ballast Calculations

The following calculations are to outline the areas used to determine the volumes of the different materials for the ballast. All sections referred to in the calculations are marked on the accompanying drawing.

E/One Series 2010i Grinder Pump Station
Ballast Calculations

Sample Calculation GP 2010i, 710mm x 2000mm Station

Volume of Station = .67 m^3
Tank Weight = 58 kg
Station Height = 2.0 m

A. Buoyant Force

1. The buoyant force acting on the submerged GP 2010i, 710mm x 2000mm is equal to the weight of the displaced water for the section of the tank that is submerged.

$$\mathbf{F}_{buoyant} = (\text{density of water})(\text{volume of station})$$
$$= (1000\ kg/m^3)(.67\ m^3)$$
$$= 670\ kg$$

2. The net buoyant force acting on the station ($F_{net\text{-}buoyant}$) is equal to the buoyant force ($F_{buoyant}$) minus the weight of the station tank.

$$F_{net\text{-}buoyant} = 670\ kg - 58\ kg$$
$$= 612\ kg$$

B. Ballast Force

1. Determine the volume of concrete & soil

Section I: Used To Determine The Volume Of Concrete

(Note: .489 m = assumed, average inside diameter of concrete ballast ring around tapered tank bottom)

$$\text{Volume} = (\text{Height})(\text{Area})$$
$$= (.178\ m)(p)((.915\ m)^2 - (.489\ m)^2)/4$$
$$= (.178\ m)(.470\ m^2)$$
$$= .084\ m^3$$

Section II: Used To Determine The Volume Of Saturated Soil

$$\text{Volume} = (\text{Height})(\text{Area})$$
$$= (2\ m - .178\ m)(p)((.915\ m)^2 - (.724\ m)^2)/4$$
$$= (1.822\ m)(.246\ m^2)$$
$$= .45\ m^3$$

2. Determine the combined ballast

$$\text{Ballast (total)} = \text{Ballast (concrete)} + \text{Ballast (saturated soil)}$$
$$= (V_{concrete})(\text{density concrete in water}) + (V_{soil})(\text{density saturated soil})$$
$$= (.084\ m^3)(1402\ kg/m^3) + (.45\ m^3)(1120\ kg/m^3)$$
$$= 118\ kg + 504\ kg$$
$$= 622\ kg$$

C. Subtract the net buoyant force from the ballast force to determine the final condition

$$\text{Final Condition} = \text{Ballast Force} - \text{Net Buoyant Force}$$
$$= 622\ kg - 612\ kg$$
$$= 10\ kg\ (\text{excess ballast})$$

E/One Series 2010i Grinder Pump Station
Ballast Calculations

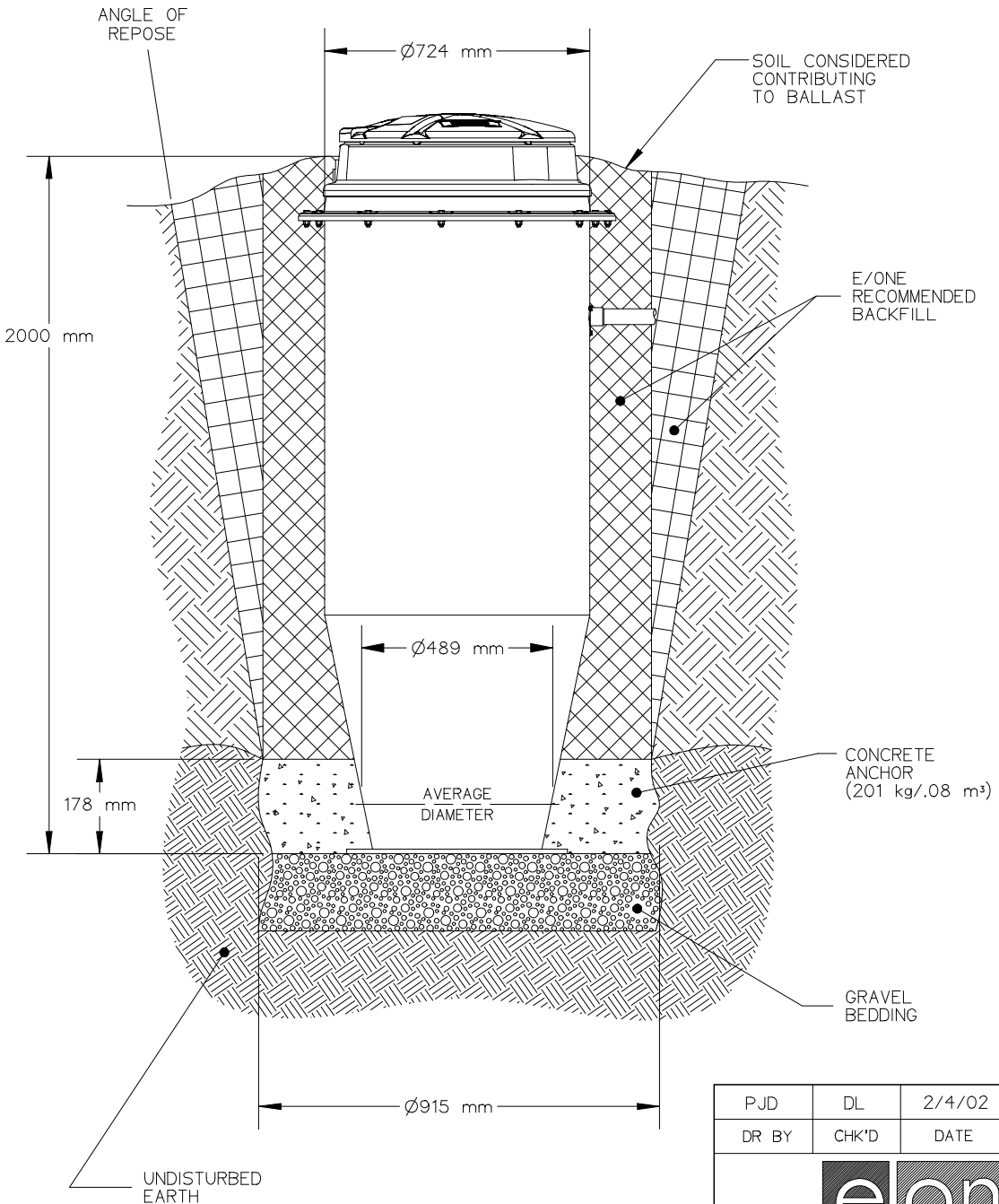
Sample Calculation GP 2010i, 710mm x 2000mm Station Continued

The approach outlined on previous page may be used
to calculate the ballast requirements listed below.

GP Model 2010i	Station Volume (m^3)	FNet-Bouyant (kg)	Tank Weight (kg)	FBallast (kg)	Volume Concrete (m^3)	Weight Concrete in Air (kg)	Minimum Diameter of Concrete Anchor (mm)	Minimum Thickness of Concrete Anchor (mm)
710 x 1500	.47	424	46	460	.049	118	915	102
710 x 2000	.67	612	58	622	.084	201	915	178

Chart 1

2010i
710 x 2000



PJD	DL	2/4/02	-	NONE
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

BALLAST INFORMATION
2010i SERIES

Environment One
2773 Balltown Road
Niskayuna, New York USA 12309-1090

PA1755P01 Rev. -
03/26/02