



**PENN VALLEY
ON-LOT SEWER FACILITIES
NEVADA COUNTY, CALIFORNIA**

**INSTALLATION &
MATERIALS SPECIFICATIONS**

DECEMBER 1990

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SECTION A
INTRODUCTION AND GENERAL DESCRIPTION

A1.0 GENERAL

The pressure sewer represents an economical means of wastewater collection that has been developed to serve in areas where conventional techniques are not feasible. The pressure sewer system used in Penn Valley is referred to as the STEP system, or Septic Tank Effluent Pump. It is comprised of a special septic tank, vault, and a small pump with level controls. These units are located at each home.

Home sewage is conveyed to special septic tanks through standard building sewers. These septic tanks, commonly referred to as interceptor tanks, collect, store solids and partially treat the sewage before the liquid portion is transported to its final point of treatment which consists of an aerated lagoon, followed by storage in an aerated reservoir, and disposal by spray irrigation of pasture. A special vault for housing the pump is fitted into each interceptor tank (Appendix A). Sewage enters the vault through the openings located in the clear region between septic tank scum and sludge zones. The pumps are for transporting the liquid portion of the waste from the tank through the system to the point of disposal. These pumps may vary in size, depending on the total head from pump to treatment plant, and proper selection is critical to the performance and longevity of the system. The sewage after entering the pumping vault then passes through a plastic screen before being pumped through the system to the treatment plant.

The septic tank, pump control panel, pump vault, screen, piping, and all appurtenances shall be installed by the homeowner in accordance with these specifications and instructions. The maintenance and repair of the pump control panel, septic tank, pump, pump vault, screen, and all pressure discharge piping shall be provided by the Nevada County Sanitation District No. 1 and is paid for by each lot owner's sewer fee. This maintenance shall include periodic pumping of the septic tank as well as the replacement of any worn or broken facilities which are a part of the septic tank, pump, pump vault, pump control panel, or pressure sewer piping. The homeowners will be responsible for the maintenance and repair of all gravity line to the septic tank. Each homeowner will be required to provide and maintain a backflow prevention device on the gravity line if any floor of the structure is at or below the elevation of the septic tank riser rim elevation.

A2.0 PUMP SELECTION

The pump selection for each installation will be made by the Nevada County Sanitation District No. 1 when it issues the sewer permit as a part of the

building permit process. The correct selection of a pump by the Sanitation District will be dependent upon each homeowner's contractor providing the correct information on elevation difference between the interceptor tank liquid level and the service box lid elevation as well as length of pressure service line and number of fittings.

A3.0 RIGHT-OF-ENTRY

The Nevada County Sanitation District No. 1 or it's representative shall have the right to enter upon any lot for the purpose of sewer system facilities inspection and maintenance.

As a part of the building permit process all lot owners will be required to execute a right-of-entry document giving the County Sanitation District this right-of-entry. Each owner will also be required to obtain a sewer permit from the County Sanitation District prior to the Building Department issuing a building permit.

A4.0 SEWER PERMIT

As discussed in A3.0 each lot owner will be required to pay sewer connection fees and obtain a sewer permit from the County Sanitation District as a condition of the building permit. The County Sanitation District shall review and approve the building plans for location of the septic tank, alarm, and control panel, and select the appropriate pump for each installation. Two copies of a site plan which shows all of the information shown on A1 shall accompany the sewer permit application.

Each septic tank location will be required to be accessible by maintenance vehicles over an all weather road constructed and maintained by homeowner for the purpose of inspection and maintenance including periodic septic tank pumping. The septic tank location shall be reviewed and approved as a part of the sewer permit.

Pump control panels and alarms shall be installed as detailed in Section C5.03 of this report. This requires the pump control panel with alarm to be mounted on the side of the house nearest the tank and pump or on a freestanding pedestal adjacent to the tank and pump. The National Electrical Code (NEC) requires that the control panel be located within 50 feet of and within sight of the pump. The control panel location shall be reviewed and approved as a part of the sewer permit.

SECTION B. INSTALLATION

B1.0 GENERAL INSTALLATION CONDITIONS

All on-lot facilities installation shall be inspected and approved by the County of Nevada Building Department and Sanitation District.

The Homeowner shall be responsible for the installation of all on-lot facilities including the following:

- a. Gravity sewer service line to interceptor/septic tank
- b. Concrete interceptor/septic tank
- c. Tank riser and lid
- d. Pump vault and screen inside tank
- e. High head effluent pump and power cable
- f. Pump pressure discharge piping
- g. Pump float controls and electrical hook up
- h. Pump control panel and alarm
- i. Pressure sewer service lateral to sewer main line connection at front property line.

B1.1 Installer

The Installer referred to herein shall be a licensed contractor retained by the Homeowner to complete the installation of on-lot facilities that are the responsibility of the Homeowner as detailed in 1.0 above.

The Installer will be responsible for initiating, maintaining and supervising all safety precautions and installation programs in connection with the work. Installations shall be accomplished such as to minimize inconvenience to traffic, the general public and to create the least damage to property.

The Installer will be responsible for scheduling the appropriate inspections, installation of electrical components, tank, pump, alarms, and pressure service line to the existing service lateral, and the overall timely completion of the work. Inspections by the Nevada County Sanitation District can be made by calling 265-1555.

The Installer shall not cover any work prior to the approval of the Field Inspector assigned to the work. Installer shall notify Underground Service Alert (U.S.A.), telephone: 800-642-2444, two days prior to construction.

Materials damaged by the Installer shall be repaired or replaced.

All requests for inspection shall be scheduled between 8:00 AM and 5:00 PM during the normal five day work week. Check with the Nevada County Sanitation District for a specific schedule of inspection, at 265-1555. Each inspection must be scheduled at least 24 hours ahead, including one normal workday ahead.

The final obligation and responsibility for correcting surface settlement will be that of the property owner or his Installer.

Installers shall be licensed and bonded when performing work in road right-of-way and must obtain an encroachment permit from the Nevada County Department of Transportation when work is to be done in a County road right-of-way. Installers shall be licensed and bonded when performing work on private property unless otherwise approved by the Sanitation District.

B2.0 TANK INSTALLATION

All tanks shall be set level and to uniform bearing on a minimum 4-inches thick pea gravel bed overlying a firm and uniform base. Tank location to be a minimum of 10-feet from dwelling or other structure. Unstable or wet foundations shall be stabilized and cared for by overexcavation and backfill with select materials, or other means as required. Excavation for the tank shall extend at least two feet outside the farthest outer dimension of the tank to allow room for proper compaction.

The Installer shall be responsible for establishing the tank elevation. Tanks shall be placed at such depth to facilitate a minimum 1/4-inch per foot slope of the building sewer. In some instances, buildings may have more than one building sewer. Care shall be taken to establish a tank elevation such that a minimum 1/4-inch per foot slope is attainable from any building sewer. Prior to backfilling, the inspection lid on concrete tanks shall be sealed with the sealant furnished to prevent infiltration, but allow removal of the cover for maintenance.

Backfill shall be placed in uniform, mechanically compacted layers of a maximum 24-inches thickness and of nearly equal height on each side of the tank so as to minimize settlement and to provide support for the tank walls. Each layer shall be thoroughly tamped with sand containing sufficient moisture to allow for proper compaction. Backfilling near to inlet or outlet pipes or the riser shall be accomplished by hand. Backfill

material shall be an imported sand or pea gravel as directed by the Field Inspector. Cover over the tank shall be a minimum of 12-inches deep, with the top 6-inches being replaced with salvaged topsoil.

Excess or unsuitable material shall be removed and disposed of by the Installer and suitable material imported. Jetting will not be allowed.

Heavy equipment shall not be operated so near the tank as to cause damage to the tank. If the tank is to be located in a location which will allow it to be exposed to traffic then it must have a traffic rated lid. Otherwise, it must be fenced or protected from traffic.

B3.0

PRESSURE SERVICE LINES INSTALLATION

A pressure service line is that 1-1/4 inch diameter , Schedule 40, pipe line which connects the interceptor tank and pump assembly to the main sewer line.

Trench depths shall provide a minimum cover of 24 inches on private land and 30 inches on public land. In some instances, depths greater than 24 and 30 inches shall be required to provide continuous slope to the pipe, to avoid obstructions, or due to utility conflict. When crossing water lines, the service line shall be at a minimum of 18-inches below the water line. The trench bottom shall be smooth and uniform.

The pipe shall be surrounded by a minimum of 4-inches of pipe zone backfill which shall be an approved sand, free of stones, sticks or other deleterious material and having a maximum particle size of 1/2 inch. Placement shall provide a firm, smooth and uniform bottom for pipe support. Material excavated from the pipe trench that is unsuitable for backfill shall be removed and disposed of by the Installer, and suitable material imported. Jetting or puddling shall no be allowed.

When in the trench, pipe ends shall be effectively plugged at all times other than when installation is actively undertaken.

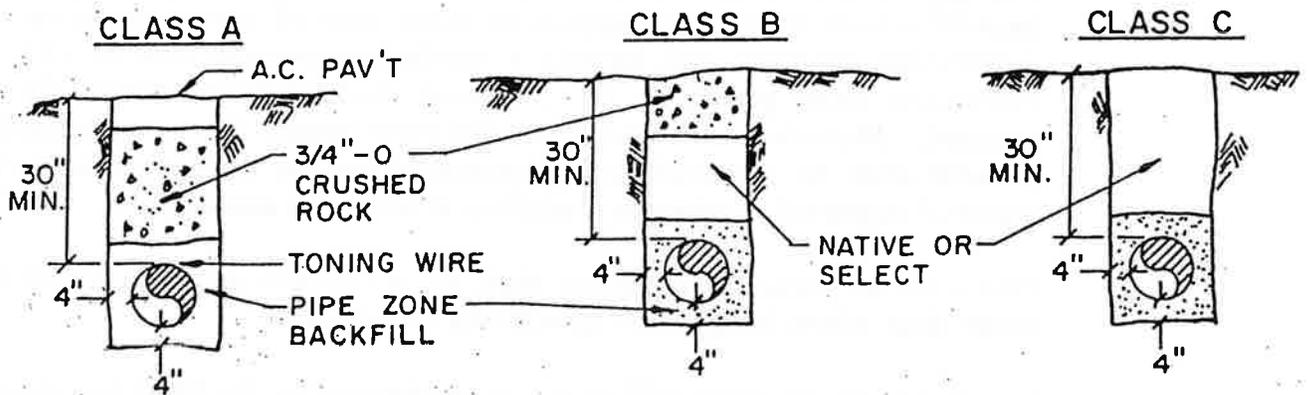
Connection to the main will be made as directed by the Field Inspector per the attached A-1 drawing. The field inspector must be present when the connection to the main is made, and assure that the service line is clean and free of debris before the connection is made.

Two-inch wide detectable tape reading "CAUTION, BURIED SEWER LINE BELOW" as manufactured by CALTICO and supplied by General Wholesale Supply of Auburn, California, shall be buried 4- to 6-inches

above the pipe.

Pipe backfill shall contain proper moisture for compaction and shall be installed as follows:

1. Class "A" Backfill. Within paved areas, pavement removal shall be made to neat, cut edges. Backfill shall be 3/4"-0 crushed rock, mechanically compacted to 90% relative max. density excepting the top 6-inches which shall be compacted to 95% relative max. density in layers not exceeding 12-inches in depth. Pavement replacement shall be a minimum compacted thickness of 3-inches or the thickness of the removal pavement, whichever is greater.
2. Class "B" Backfill. Within graveled areas, backfill shall be native material, if suitable, otherwise imported select backfill and shall be compacted by wheel rolling. Replacement of surfacing shall be 3/4"-0 crushed rock, compacted to 95% relative max. density by wheel rolling and shall be placed to a minimum compacted thickness of 6-inches or the thickness of the removed surfacing, whichever is greater.
3. Class "C" Backfill. Backfill shall be native material if suitable, otherwise imported select backfill and shall be compacted by wheel rolling to 85% relative max. density.



B4.0 ELECTRICAL REQUIREMENTS AND INSTALLATION

Wiring from the home to the panel shall be provided by the property owner. The property owner will supply 115 or 230 volt service depending on the pump requirements and a separate circuit, utilizing 10/3 cable with ground, and 30 amp dual element fuses or circuit breakers at the main panel. The location of the panel shall be as detailed in Section C5.03 herein. The property owner will be responsible for paying the monthly electric bill for the pump.

Installation of panel, connections to the home wiring and wiring to the pump and controls shall be the responsibility of the Installer. The wiring is to be accomplished by a licensed electrician under the direction of the Installer. The cable from the panel to the pump vault shall be placed within a 1-1/4 inch diameter PVC electrical conduit buried a minimum of 24 inches. An explosion proof conduit seal shall be installed per the attached A-5 drawing and shall be filled with approved sealant. Electrical service and connection must be inspected and approved by the Nevada County Building Department.

B5.0 GRAVITY SERVICE LINE INSTALLATION

The building sewer is the line between the building served and the interceptor tank. The property owner will be responsible for its installation and future maintenance. Pipe materials and installation shall be per the Uniform Plumbing Code. This line will be inspected by the Nevada County Building Department.

B6.0 SPECIAL CONDITIONS

All threaded connections shall be coated with vaseline or wrapped with teflon tape.

Vaseline shall be applied to the gasket surface of the pinlug coupling immediately prior to assembly. Insure that all irregularities are removed from adjoining nipple prior to assembly.

When unstable walls, unstable bottom, overexcavation or water are encountered in construction and would be detrimental to the proper installation of the work as determined by the Field Inspector, they shall be stabilized and cared for in accordance with recognized standard practice and as approved by the Field Inspector.

Existing topsoil shall be salvaged and replaced over tank and pipe

excavations to an approximate depth of 6 inches.

SECTION C. MATERIALS SPECIFICATIONS

C1.0 PRECAST CONCRETE INTERCEPTOR TANKS

C1.01 GENERAL

This section describes precast concrete interceptor tanks and material. All residential tanks to be installed shall be 1,000 gallons as indicated in the drawings on pages A-1, A-2, and A-4. Georgetown Precast and Merrill & Sons are both acceptable manufacturers.

Tanks shall be manufactured and furnished with access opening 18-inches in diameter and of the configuration shown on the standard drawings. Tanks shall have a 24-inch diameter by 1/2-inch groove formed in the top of tank at the access opening for installation of 24-inch diameter PVC riser. Modification of completed tanks will not be permitted. Inlet plumbing shall penetrate 12-inches into the liquid from the inlet flow line. Tank shall be installed in strict accordance with the manufacturer's recommended installation instructions.

C1.02 QUALITY ASSURANCE

A. Source Quality Control

1. Cast 6 test cylinders each day of concreting operation.
2. Cast 6 additional cylinders whenever there is a change in concrete mix during a day's operation.
3. Test at least 1 cylinder per set at 28 days.

B. Reference Standards

1. ACI 318: Building Code Requirements for Reinforced Concrete
2. ACI 350R: Concrete Sanitary Engineering Structures
3. ASTM A615: Deformed Billet-Steel Bars for Concrete Reinforcing
4. ASTM C33: Concrete Aggregates
5. ASTM C150: Portland Cement

C1.03 SUBMITTALS

A. Shop Drawings and Product Data

1. Design calculations with pertinent tables, charts, and definitions.
2. Complete layout, fabrication, and installation drawings showing

- inserts and embedments.
- 3. Field joint details.
- 4. Limitations of field cutting and modification.
- 5. If requested by Engineer, information on plant capability, productivity, certification, and details of manufacturing equipment and procedures.

B. Test Reports

- 1. Certified reports covering source and quality of materials
- 2. Certified reports of compressive strength of each design mix.
- 3. Stamped structural calculations by a California Registered Civil or Structural Engineer.

C1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling

- 1. Transport and handle precast concrete units with equipment to protect from dirt and damage.
- 2. Do not place units in positions that will cause overstressing, warping, twisting or cracking.
- 3. Handle by means of lifting inserts or other means to prevent cracking.
- 4. Concrete shall have a minimum compressive strength of 3,000 psi at day of shipment.

B. Storage

- 1. Store units off ground.
- 2. Place stored units so that identification marks are discernible.

C1.05 PERFORMANCE AND DESIGN REQUIREMENTS

A. Structural Design

- 1. Design in accordance with ACI 318 as modified by ACI 350R-83
 - a. $Z = 95$
- 2. Loadings (apply simultaneously)
 - a. 3-feet of backfill over the top
 - b. Groundwater table 3-feet over top of tank
 - c. Tank empty

- d. Lateral pressures: Equivalent fluid pressure of 95 lb/ft
 - e. Traffic rated tank top where indicated or required
3. Minimum thickness for exterior walls, bottom and top: 4 inches
 4. Provide integral stiffeners as required

B. Nominal Capacity - 1,000 gallons

C1.06 MATERIALS

A. Reinforcement

1. Reinforcing steel: ASTM A615, Grade 60

B. Concrete

1. Minimum compressive strength: 4,000 psi at 28 days
2. Cement: ASTM C150, Type II
3. Aggregate: ASTM C33, 3/4 inch maximum

C. Hardware

1. 304 Stainless Steel

C1.07 FABRICATION AND MANUFACTURE

A. General

1. Use rigid, adequately braced forming equipment free from dents, gouges, or irregularities that would impair quality or performance.
2. Floor and walls of each tank to be monolithically cast.
3. Top slab to be sealed watertight to walls.
4. Provide internal baffles, vents, and piping as shown on drawings.

B. Embedded Accessories

1. Install plates, inserts, anchors, and other items required to be embedded at the time of manufacture.
2. Accurately position embeddings in forms and fix rigidly in place.
3. Provide lifting loops or similar devices to facilitate handling.

C. Inlet and Outlet Connections

1. Seal all penetrations watertight.

2. Form holes and place penetrations perpendicular to face of tank wall.
3. Provide saddles, headers, or other suitable supports required for the size and location of the openings.
4. Inlet plumbing shall penetrate 12-inches into the liquid level from the inlet flow line.

D. Riser Sections - Ribbed PVC set in 2-part epoxy

E. Waterproofing

1. Seal all joints with strip bituminous, butyl rubber or approved equal.
 - a. Submit joint details for approval.

C1.08 INSTALLATION

A. GENERAL

1. Set in position in accordance with the Drawings.
2. Prepare foundation of 4-inch aggregate base coarse (ASTM C-33).
 - a. Compact to 90% relative max density (ASTM 2049).
 - b. Provide firm, uniform base. Unit shall not rock.
3. Place backfill around sides of tank.
 - a. Compact to 90% max dry density (ASTM 1557).
4. Seal all joints after installation with 2 parts polyurethane expansion joint sealer.

C1.09 FIELD TESTING

1. Test all tanks
2. Hydrostatic test
 - a. Plug all inlets and outlets.
 - b. Fill tank to full height including riser.
 - c. Allow water to stand for 24 hours.
 - d. Leakage tested during following 24-hour period.
 - e. Leakage: Any loss in 24-hour period constitutes failure.
 - f. Repair and retest all tanks that do not pass leakage test.

C2.0 RISERS AND LIDS

C2.01 OUTLET RISERS

Outlet risers shall be ribbed PVC as manufactured by Orenco Systems, Inc. Risers shall be at least 12 inches high, shall have a minimum nominal diameter of 24 inches when used with 12-inch diameter pump vaults and shall be factory-equipped with the following:

1. **Neoprene Grommets.** Two 1-inch diameter grommets, one for the splice box and one for the pump discharge, installed as shown on the drawing.
2. **Adhesive.** Two-part epoxy, one pint per riser, for bonding riser to tank.

C2.02 LIDS

One shall be furnished with each riser. Lids shall be Orenco Systems Model FL-24g fiberglass with green aggregate finish, and provided with neoprene gasket, stainless steel bolts and wrench. The riser and lid combination shall be able to support a 2500 lb. wheel load. (Note: This is not to imply that PVC risers are intended for traffic areas. Please refer to section on traffic protection.)

C2.03 INSULATION

Rigid closed-cell foam insulation of 2- or 4-inch thickness shall be bonded to the underside of the lid.

C2.04 RISER INSTALLATION

Riser installation shall be accomplished according to the manufacturer's instructions.

C3.0 STEP PUMP VAULT & SCREEN ASSEMBLY

C3.01 MATERIALS

All pumping systems shall be Orenco Systems Model 8OSI HH series High-Head Pumping Assemblies composed of:

1. **Riser and Lids.** As specified in Section C2.0.
2. **Screened Pump Vault.** Model SV1260Fi, PVC vault, fitted with 1/8-inch mesh polyethylene screen and a 4-inch diameter PVC flow inducer for a high head pump.

C3.02 INSTALLATION

Installation shall be in accordance with these specifications and drawings and in accordance with the manufacturer's instructions.

C4.0 HIGH-HEAD EFFLUENT PUMP

C4.01 PUMP DESIGN

Pump shall be specifically designed to pump effluent into high pressure wastewater collection systems.

All residential effluent pumps shall be Orenco Systems Inc., 80SI HH Series 1/2 hp through 3/4 hp.

All pumps supplied must be constructed per (and bear the label of) an authorized testing authority such as Underwriter's Laboratories, Inc. (UL) or Canadian Standard Association (CSA) for effluent duty.

Pumps shall have an 8-foot long extra heavy duty (SO) electrical cord with ground to motor plug.

Pump shall be constructed of entirely non-corrosive materials such as stainless steel and thermoplastics.

Impeller shall be of partial emission type. Impeller shall be made of non-corrosive stainless steel or thermoplastic.

A. Motor

1. Pump motor shall be of the submersible type. Motor shall be of horsepower specified: Single Phase, 115 or 230 Volts, 60 Hertz, 350 RPM minimum Franklin Electric Super Stainless or equal.
2. Single phase motors shall be thermally protected with an automatic reset feature.

C4.02 OPERATING CONDITIONS

The effluent pump shall be of the submersible high head type capable of delivering 5 GPM against a total dynamic head (TDH) as determined using the enclosed hydraulic grade line (HGL) elevations and the datum elevation provided for each lot. The TDH shall include the static head

from the HGL to the liquid level of the interceptor tank plus all dynamic head losses in the on-lot pumping system assuming the pump is pumping a minimum of 5 GPM. Pump selection shall be made using the enclosed OSI 8 OSI HH pump curves for the 1/2 HP - 3/4 HP range.

C4.03 POWER CABLE

- A. Power cable motor-end terminations shall enter the submersible pump assembly by quick connect fittings that are watertight to assist in pump replacement.
- B. Cable shall be rated for NEC severe service "S".

C4.04 WARRANTY

Submersible Effluent Pump(s) limited warranty period shall exist for a period of twelve (12) months from date of installation or eighteen (18) months from date of manufacture, whichever period is shorter.

C5.0 PUMP CONTROL PANEL

C5.01 GENERAL

The pump control panel shall be an Orenco Systems, Inc. Model S-IRO simplex pump control/alarm panel with the following features:

1. **Redundant OFF Relay:** 115 V, automatic, single pole.
2. **Audible Alarm:** Panel mount with a minimum of 80 db sound pressure at 24 inches. Continuous sound. Higher decible alarm is available and should be used at remote pedestal installations or a second audible alarm should be provided at the house.
3. **Visual Alarm:** NEMA 4-rated, 7/8-inch diameter, oiltight, with push-to-silence feature.
4. **Audio-Alarm Reset Relay:** 115 V, automatic, with DIN rail mount socket base.
5. **Toggle Switch:** 15 amp motor rated, single-pole, double-throw with three positions: manual (MAN), (OFF) and automatic (AUTO).
6. **Fuse Disconnect:** DIN rail mount socket base with 2 amp SLO BLOW fuse.

7. **Current-Limiting Circuit Breaker:** Rated for 20 amps, OFF/ON switch, DIN rail mounting with thermal magnetic tripping characteristics.
8. **Enclosure:** NEMA 4X-rated, fiberglass with stainless steel or non-metallic hinges, stainless steel screws and padlockable latch, 8-inches high x 6-inches wide x 5-1/8 inches deep.
9. **Alarm Circuit:** Wired separately from the pump circuit so that, if the pump's internal overload switch or current-limiting circuit breaker is tripped, the alarm system remains functional.
10. **Cycle Counter:** 6-digit, non-resettable.
11. **Elapsed Time Meter:** 7-digit, non-resettable.

All wiring in the panel shall be MTW. Wiring shall be routed, bundled, and secured in a neat manner. The control enclosure shall be a fiberglass NEMA 4X enclosure as manufactured by Hoffman Engineering Company or approved equal. The enclosure shall be furnished with a stainless steel hinge and padlockable latch.

The control panel and its components shall be assembled in accordance with the National Electric Code, and all state and local codes. The assembled control panel shall be constructed per (and bear the label of) Underwriter's Laboratories, Inc. (UL) or Canadian Standard Association (CSA).

The panel manufacturer must demonstrate that the panel is adequately sized to protect the pumps as the given full load current. This includes short circuit protection, a fused control circuit to protect the wiring, the pilot devices and float switches, and shall include a two-year warranty.

C5.02 **INSTALLATION**

All pumping systems shall be installed in accordance with the manufacturer's recommendations and the standard plans.

C5.03 **LOCATION**

The pump control panel shall be mounted on the side of the house nearest the tank and pump or on a freestanding pedestal adjacent to the tank and pump. NEC requires that the control panel be located within 50

feet of and within sight of the pump.

C6.0 PUMP FLOAT CONTROL ASSEMBLY

C6.01 GENERAL

The pump controls shall be Orenco Systems, Inc. Model MF-ABR float type mercury switches hermetically sealed in a solid corrosion and shock resistant material.

All switches shall be UL and/or CSA listed and shall be rated for 4.5 A @ 120 V.

A float switch support PVC bracket shall be attached to the side of the pump vault. Switches will not be attached to the pump discharge piping.

The switch cables shall be terminated to a single "Quick-Connect" pin and sleeve connector for ease installation and service. "Quick-Connect" connection shall be properly sized and manufactured by Joy Cam. Lock or equal.

The high- and low-level alarms and on-off function shall be preset as shown on Drawing 2 on page A-4.

Differential float shall operate in a range of 3-1/2 inches.

C7.0 JUNCTION BOXES

C7.01 GENERAL

All junction boxes (where used) shall be NEMA 4X rated fiberglass with water-tight cord grips and UL approved for wet locations.

Box lids will be hinged, fully rubber gasketed and with a minimum four (4) stainless steel screws. All junction box screws shall be captive.

Box shall be equipped with four (4) electrical cord grips and a 3/4-inch outlet fitting. Cord grips shall be corrosion resistant Hubble or Woodhead type. Also included shall be UL-listed heat shrink and butt connections. All conduit shall be sealed with EY conduit seal.

C8.0 PUMP VAULT PIPELINE AND FLEX HOSE

C8.01 PVC PIPE AND FITTINGS

Where rigid PVC pipe is used on pump discharge, it shall be PVC Type 1, Grade 1, Schedule 40 or Schedule 80. Fittings shall be PVC Type 1, Schedule 40 solvent weld fittings and comply with ASTM D2466.

C8.02 FLEX HOSE AND FITTINGS

Discharge hose and valve assembly shall be Orenco Model HV100B, 1-inch diameter, 150 psi PVC ball valve, PVC flex hose with working pressure rating of 100 psi and Schedule 40 PVC pipe. For the 3/4 HP, a 150 psi rating will be required.

Flex hose shall be made of PVC hose with a rigid PVC inner helix.

Working pressure shall be no less than 100 psi. Care should be exercised so that the maximum pump shutoff head does not exceed 75% of the working pressure of the pipe.

Appropriate methods of assembling the flex hose discharge assembly will not include insert fittings and hose clamps.

12-inches of flex hose shall be installed outside the riser with an appropriate adaptor for connection to m 1-1/4 inch, Schedule 40, pressure service lateral piping.

C9.0 VALVES

C9.01 CHECK VALVES

Pump discharge check valves shall be PVC ball check valves designed for wastewater effluent pump applications and rated for 150 psi.

The ball check valves shall be made of non-corrosive materials.

The ball check valves shall be Chemtrol Model "BC" or approved equal.

C9.02 BALL VALVES

Ball valves shall be PVC, quarter turn shut-off valves, 1-inch minimum, 150 psi rating.

Ball valves shall be located downstream of disconnect for pump removal. Where a union ball valve is used, it shall be of double union design and

have positive seal providing for safe removal of the pump side union.

Ball valves shall be located where they can be easily operated from the ground surface.

Ball valves shall be Chemtrol Model "TU" Tru-Union Ball Valves or approved equal.

C9.03 BACK WATER VALVE

Gravity sewer line backwater valves shall be 4-inch PVC or ABS plastic with solvent cement connections. Valve shall be a swing check with removable flapper and self-lubricating hinge. Valve shall be water tight with a 10-foot water column. The valve shall have a quick-open inspection cover and be installed in a valve access box for ease of inspection. Box shall be 12" x 12" with extensions as required and a lid to be installed at grade. Box and lid shall be molded of high impact plastic.

C10.0 PRESSURE SEWER LATERAL PIPING

C10.01 GENERAL

Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for the installation and pressure testing of PVC pressure sewer pipe for the pump discharge as shown on the plans and specified herein.

C10.02 MATERIALS

Where rigid PVC pipe is used on pump discharge, it shall be PVC Type 1, Grade 1, Schedule 40 or Schedule 80. Fittings shall be PVC Type 1, Schedule 40 solvent weld fittings and comply with ASTM D2466. If Schedule 40 fittings are not available, the Engineer should be consulted to determine which material will be used.

PVC couplings shall be Flo model number 110-15 rated for 330 psi working pressure. Couplings shall have PVC compression fittings sized for iron pipe sizes.

C10.03 INSTALLATION

PVC sewer service line shall be 1-1/4 inch Schedule 40 installed with 24 inches minimum cover on private land and 30 inches on public land. Pipe shall be clearly marked with a warning tape placed on the trench 4- to

6-inches above the pipe. The tape shall be a warning type 2-inches wide detectable tape reading "CAUTION, BURIED SEWER LINE BELOW" as manufactured by CALTICO and supplied by General Wholesale Supply of Auburn, California.

All threaded connections shall be wrapped with teflon tape.

C10.04 PRESSURE TESTING

PVC sewer service line shall be pressure tested for leakage. Raise pressure to 150 psi and maintain for 2 hours. Pressure loss \leq 5 psi over the two hour period is acceptable. Air or water tests are both satisfactory.

OSI HIGH-HEAD PUMPING SYSTEM INSTALLATION AND MAINTENANCE INSTRUCTIONS

- STEP 1:** Carefully read and follow all installation instructions. Improper installation may void warranties.
- STEP 2:** Inspect your order for completeness and inspect each component for shipment damage.
- STEP 3:** Check to be sure the instructions and items supplied comply with state and local regulations.
- STEP 4:** Make certain the tank and riser are installed according to the manufacturer's instructions.
- STEP 5:** Install the electrical control panel within view of the tank (locate either on interior or exterior wall). If possible, position in the shade and protect from weather. Refer to instructions accompanying the panel (inside enclosure).
- STEP 6:** If the electrical wires from the panel to the pump vault are placed in a conduit, a conduit seal must be used in accordance with the National Electrical Code (NEC) to prevent transmission of moisture from a leaky conduit back into the splice box.
- STEP 6:** Before the screened vault can be placed in the tank, support pipes must be inserted through the slots in the top of the vault. Rotate each support pipe until the stainless-steel screw snaps into the 1/4-inch hole between the slots. Once the support pipe is in place, slightly back off the stainless steel screw to secure it.
- STEP 7:** Position the screened vault in the tank as shown in Drawing 2g.
- STEP 8:** Install the electrical splice box in the grommet provided in the riser.

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STEP 9: Screw the hose and valve assembly into the pump discharge and carefully lower the pump into the 4-inch diameter PVC flow inducer inside the screened vault (see Drawing 2g).

STEP 10: Push the pump and level control wires through the watertight cord grips into the electrical splice box. Leave a length of electrical cord coiled inside the riser adequate to allow easy removal of pump and float assembly. Bring the power source and control panel wires through conduit to the splice box and *splice with butt connectors and heat shrink* from the kit provided.

Note: The colored wire marker on each float cord identifies that float's particular use as follows:

Red (2) – Redundant OFF

Blue (3) – ON-OFF

Yellow (4) – High-level ALARM

The numbers on the wire markers correspond to the numbers on the terminal strip in the Model S-1ROPRL and S-2ROPRL Control Panels, e.g. one wire from the "ON-OFF" float goes to position 3 on the panel's terminal strip.

STEP 11: Tighten the cord grips *by hand, not by tool*, then test the tightness of the cord grips by tugging on each cord. A cord is secure when the cord grip is tight enough to prevent slippage. Leave a length of cord inside the splice box adequate to allow easy removal during future disconnecting and resplicing.

Note: OSI high-head pump motors are equipped with a special "Extra Hard Usage" three-wire cord. The motors are "two-wire"; the third wire in the cord is a ground wire which must be grounded in compliance with the National Electrical Code and state and local codes.

STEP 12: Orient the hose and valve assembly as shown in Drawing 2g. Pass the 1-inch discharge pipe through the neoprene grommet in the riser. Thread the short length of flexible hose provided onto the threaded end of the plumbing discharge protruding outside the riser.

STEP 13: The float assembly comes positioned in the vault. THE FLOATS ARE PRESET FOR DESIRED DRAWDOWN. DO NOT ALTER THE TETHER LENGTH WITHOUT FIRST CONSULTING THE ENGINEER OR MANUFACTURER.

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STEP 14: Start up:

- (a) Fully open the ball valve.
- (b) Be sure the pump is submerged in water before continuing.
- (c) When using an S-1ROPRL or S-2ROPRL Control Panel with an MF-ABR Float Assembly, set the MOA switch in the control panel on manual (MAN). Check the automatic operation of the alarm: raising the top float should activate the red light and audible alarm. Check to ensure that the pump is now running, then move the MOA switch to automatic (AUTO). To check the automatic operation of the pump: While keeping the "Redundant-OFF" float in the "up" position, raise the "ON-OFF" float and the pump turns on; lower the "ON-OFF" float and the pump shuts off. Lowering the "Redundant-OFF" float with the "ON-OFF" float up turns the pump off.
- (d) A 1/8-inch diameter recirculation hole is provided in the discharge head of OSI pumps. During the pumping cycle, some noise as a result of the recirculation within the 4-inch diameter flow inducer is to be expected.

STEP 15: The ability to easily remove a screened vault for maintenance is essential and is dependent upon careful installation in accordance with the preceding instructions. To be certain that correct installation has been achieved and to avoid future maintenance problems, the installer should go through the removal process described below (steps a-h).

MAINTENANCE (Provided by Sanitation Dist.)

The alarm is triggered when the liquid in the tank reaches a level that is higher or lower than it should be. To silence the alarm, push the red light on the alarm panel. As soon as possible, call your pump service person or, if you're in a sewer district, call the district's service number. With normal use, the tank has reserve storage capacity good for 24 hours. When the liquid level in the tank has been lowered, the red light on the panel will go out and the audible alarm will reset automatically.

The pumping system should be inspected annually. If the liquid level inside the screen is discernibly different from the level outside the pump vault, remove the screened vault and clean it following these steps:

- a) Turn off the power by switching the pump's circuit breaker and the disconnect fuse to their "off" positions.
- b) Make sure the ball valve is completely closed.
- c) Disconnect the PVC union located next to the ball valve.

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- d) Remove the pump from the flow inducer, setting it aside on the fiberglass lid or on a piece of plastic film to protect it from mud or sand. The pump's electrical cord need not be disconnected.
- e) By hand or with a utility tool (3/4-inch holes in the top of the vault are for insertion of the tool), pull the screened vault out of the tank. *There should be ample clearance between the ball valve and the splice box to allow unhindered removal of the vault.*
- f) Remove the float assembly from the vault and hose off the floats if needed.
- g) Remove the screen from the vault and hose off vault and screen if needed.
- h) Reassemble screen, vault and float assembly and replace in tank. **VERY IMPORTANT** –*To prevent the vault from floating and the screen from being fouled by solids floating in the tank, it's essential to run clear water (as from a hose) into the vault to sink it.*

Premature plugging of the screen may result from abuse of the system. Such abuse might take the form of a large-scale home canning project with concurrent overuse of the garbage disposal. More likely though, it will be excessive inflow resulting from a plumbing leak under the house, a leaky septic tank, a homeowner taking in laundry, two or more families using a tank designed for one, etc.

Plugging of the screen, however, should be considered a *success*, not a failure, as the screen serves to protect the integrity of the collection and treatment facilities. Cleaning a screen is quick and easy and infinitely preferable to the damage that solids carryover can cause downstream in the system. Furthermore, it allows for identification of a problem at its source.

Homeowners should be provided with a copy of the "Do's and Don'ts" user manual so they can avoid possible problems.

CAUTION: *The tank access lid must be properly secured to the riser at all times. If bolts are lost or damaged, contact Orenco Systems immediately for replacements.*

AN UNLOCKED LID OR OPEN TANK ACCESS IS A SAFETY HAZARD!

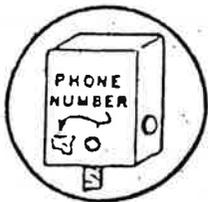
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OPERATION OF "ON-LOT" SEWER FACILITIES
PENN VALLEY



DO familiarize yourself with the location of the electrical control panel and note the number on the panel. Refer to this number when reporting a malfunction in the system to the district office so that maintenance personnel can identify exactly which unit has the problem.



DO call (night or day) 265-1555 whenever the alarm comes on...it sounds like a smoke alarm. The audible alarm can be silenced by pushing the illuminated light located directly above the "PUSH TO SILENCE" label on the front of the electrical control panel. With normal use the tank has a reserve storage capacity good for 24-hours.



DO be aware that the district maintenance personnel will service and maintain all equipment excepting the inlet plumbing. Maintenance will be done during normal working hours, except in emergencies. Note: The plumbing from the home to the interceptor tank will be the responsibility of each property owner.



DO call 265-1555 should you have any questions concerning billing on your account. Your monthly sewer charge will be collected on an annual basis by the Tax Collector's Office. Any assessment on the operation and maintenance of the system will be billed and collected by the Tax Collector on an annual basis.



DO realize that all legal matters, monthly sewer charges and assessment payments are the obligation and responsibility of the property owner of record. All correspondence will be directed to the owner of record and the owner will be responsible for compliance and informing any tenant users.



DO feel free to place a bird bath, potted plant or other yard decoration on the tank riser lid, as long as it can be readily removed for the sake of maintenance.



DON'T construct a new drainfield, cesspool or privy; a better way has come to our community. Hook up to the new sewer system all grey water, such as washing machines, shower stalls, etc. Prior to hook-up, consult with the District at 265-1555.



DON'T start digging and find an underground utility with your backhoe. Before you dig, telephone the "USA" number 1-800-642-2444, and the utilities which have underground facilities in the area will come to surface mark their lines.



DON'T connect eave troughs or storm drains or allow other surface water to get into the new pressure sewer. This additional water will increase pumping costs, deplete the available capacity of the collection system and add needlessly to the daily volume of water the treatment facility has to process.



DON'T flush undesirable substances in the new sewer. Flushing flammable and toxic products is dangerous, while other materials such as sanitary napkins, large amounts of hair and grease are a maintenance nuisance.

DON'T try to hook up to a pressure main without the proper tools and supervision. The new sewer lines are under high pressures.



DON'T drive over the interceptor tank or riser as damage can result. If your tank is in an area subject to possible traffic, consider putting up an attractive barricade or row of shrubs to discourage traffic unless the tank has been equipped with a special traffic lid. Depending on the circumstances, damage of this nature may be chargeable to the property owner of record.

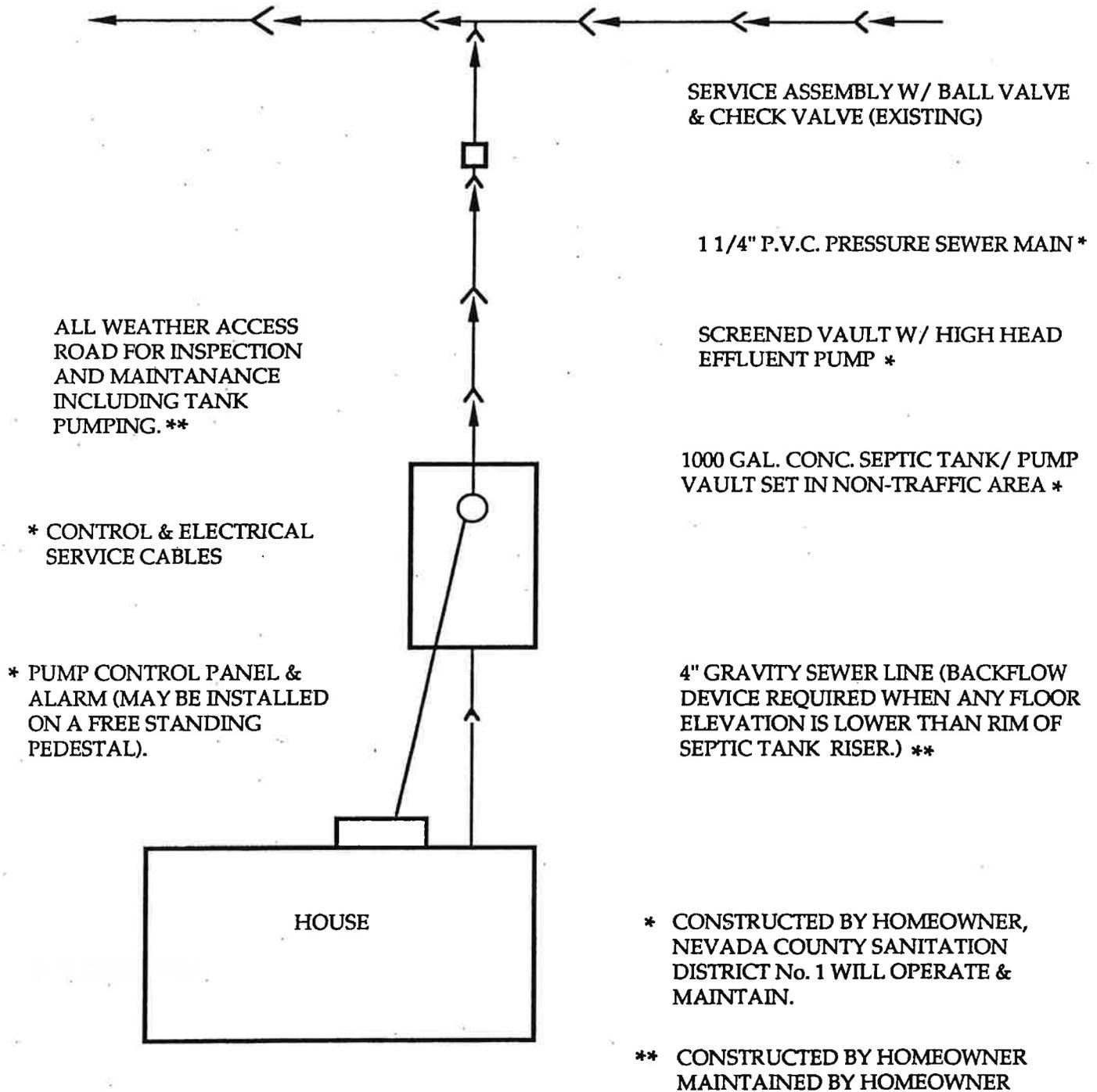


DON'T vandalize or tolerate vandalism of our new sewer system. Repairs necessitated by abuse or deliberate misuse will be charged to the property owner. Too many problems can lead to rate increases for us all.



APPENDIX A

SEWER MAIN STREET (EXISTING)

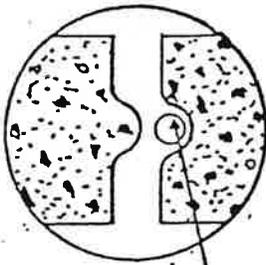


TYPICAL ON-LOT
SEWER FACILITIES

SPECIFICATIONS:

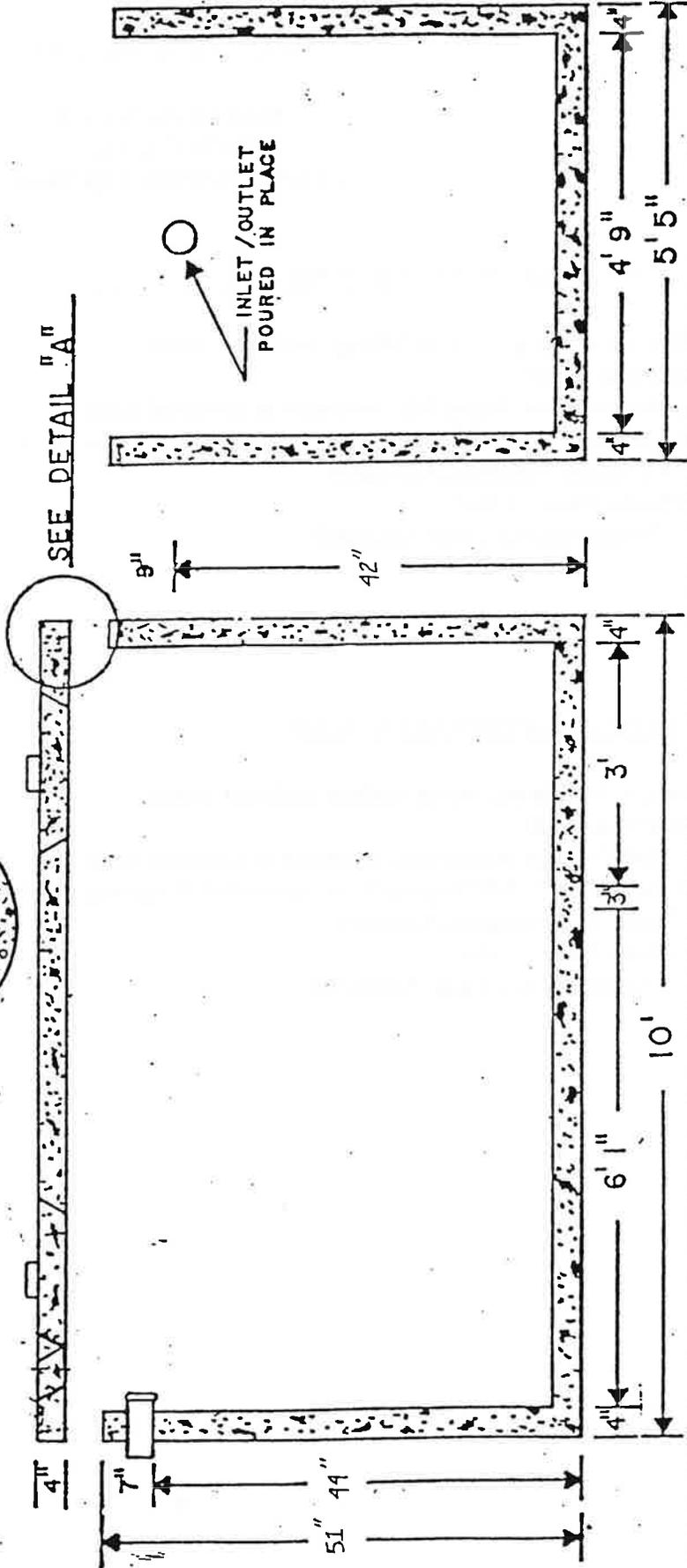
- A. CONCRETE, PORTLAND CEMENT, TYPE II, MIN. COMPRESSIVE STRENGTH - 4000 P.S.I. AT 28 DAYS.
- B. REINFORCING BAR, INTERMEDIATE GRADE, ASTM A615.
- C. INTERNAL FITTINGS - 4" ABS.
- D. INTERNAL/EXTERNAL COATINGS PER SPECIFICATIONS.
- E. STANDARD GROUND WATER SEAL - BUTYL MASTIC AND / OR CEMENT MORTAR.

CAPACITY	A	B	C
1000 gal.	51"	44"	42"



DETAIL "A"

MASTIC



SEE DETAIL "A"

INLET / OUTLET
POURED IN PLACE

GPC

SEPTIC TANK - MONOLITHIC CONSTRUCTION

GEORGETOWN PRE-CAST, INC., P.O. BOX 65, GEORGETOWN, CA. 95634
916-333-4404

SCALE: 1/2" = 1'

DATE: 7/88

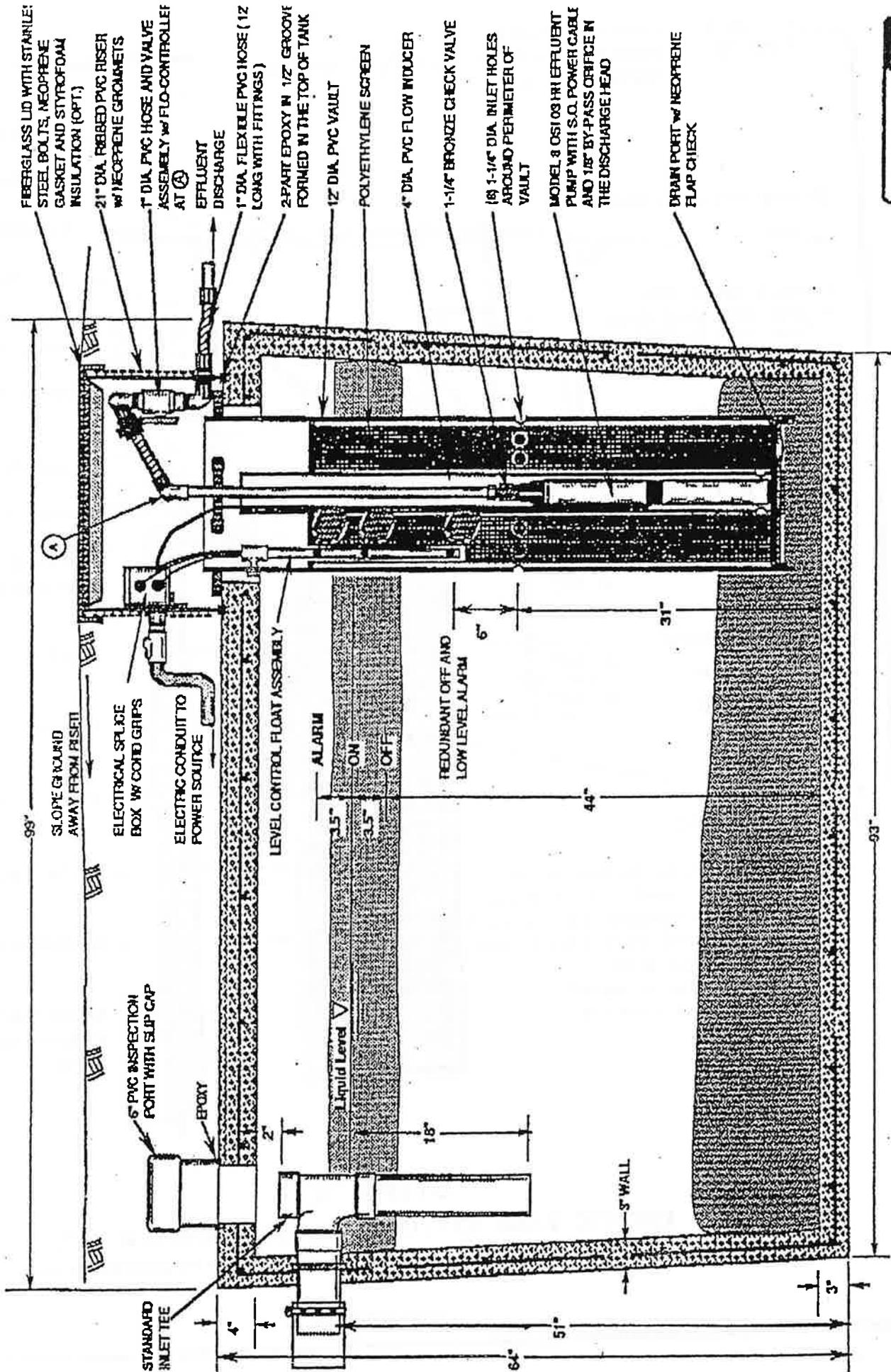
REVISED: J. Long

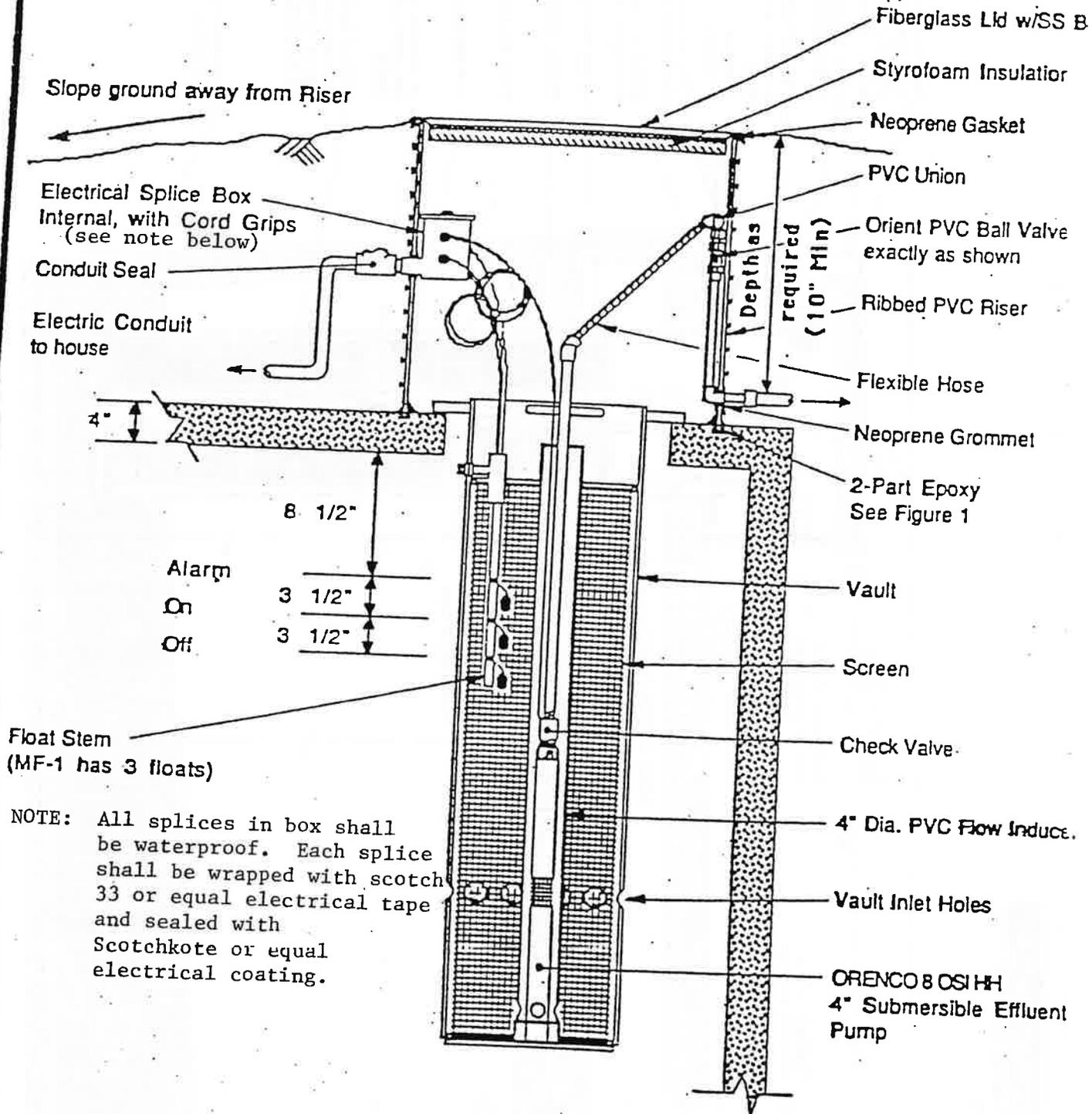
ORENCO SYSTEMS, INC.

MATERIALS LIST
PENN VALLEY
ON-LOT PUMPING EQUIPMENT

<u>1/2 HP PUMP INSTALLATIONS</u>	<u>MODEL</u>
Splice Box w/cord grips, outlet fittings and heat shrink	SB4i
Screened Pump Vault	PVU681819
Mercury Switch Float Assembly, mounted in screened vault	MF-VBX
Effluent Pump 1/2 HP, 1/8" bypass hole, grounded SO power cord	8 OSI O5HH PF1000511
Internal Valve and Pumping Assembly	HV100BVX
Control/Alarm Panel, 115V	S1CTROETMPRL
Quick Disconnect for Float Assembly	

<u>3/4 HP PUMP INSTALLATIONS</u>	<u>MODEL</u>
Splice Box w/cord grips, outlet fittings and heat shrink	SB4i
Screened Pump Vault	PVU681819
Mercury Switch Float Assembly, mounted in screened vault	MF-VBX
Effluent Pump 1/2 HP, 1/8" bypass hole, grounded SO power cord	8 OSI O7HH PV1000712
Internal Valve and Pumping Assembly	HV100BVX
Control/Alarm Panel, 115V	S1CTROPRL
Quick Disconnect for Float Assembly	





STEPS "A"
(SEPTIC TANK EFFLUENT PUMPING SYSTEM "A")
 Dimensions as shown are for typical 1000 gallon single compartment tanks

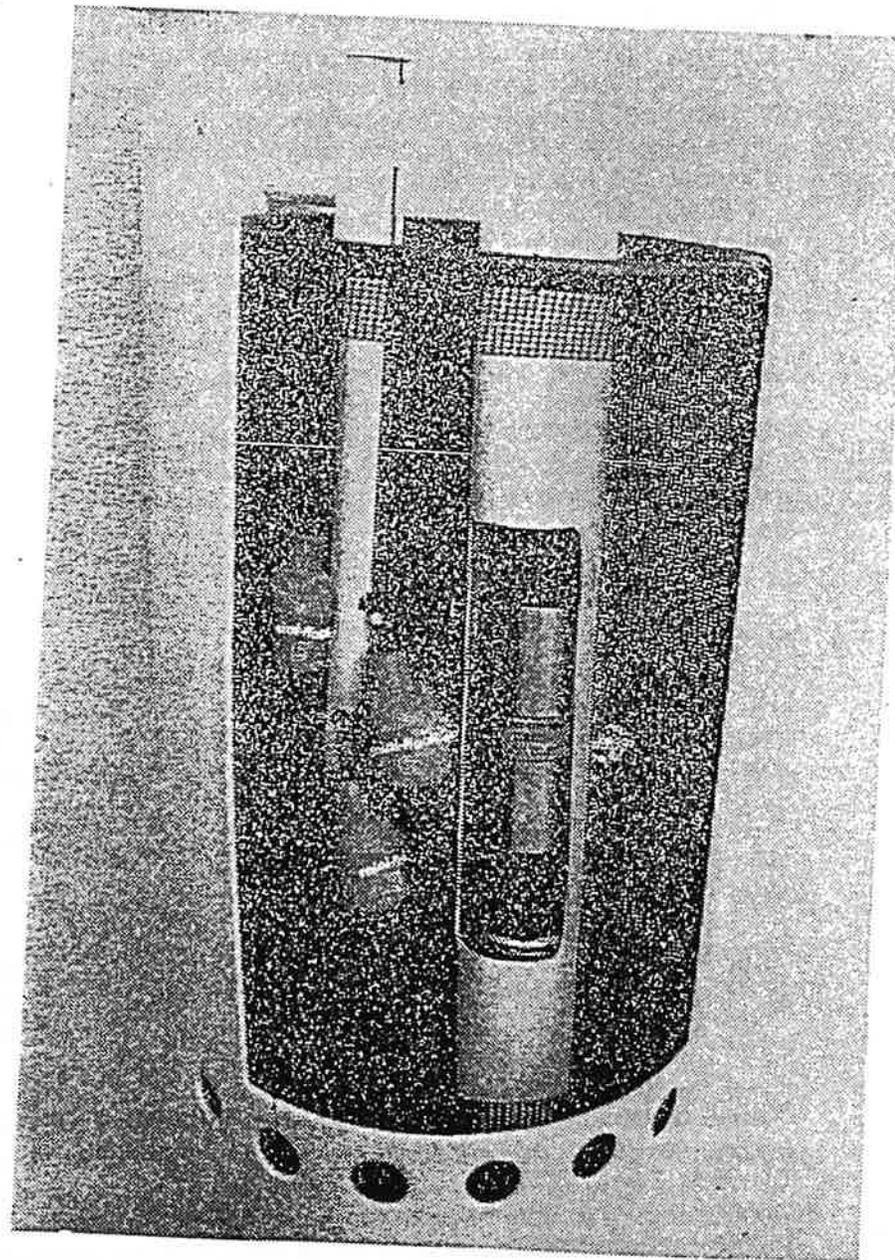
FIGURE 2:

OSI HIGH-HEAD PUMPING ASSEMBLY

A patented system used in a variety of applications, including (STEP) pressure sewers and for dosing drainfields as well as sand and gravel filters. An OSI 1/3 Hp high-head pump can handle heads up to 165 feet; our 1/2 Hp model can handle heads up to 225 feet.

The assembly drops neatly into a septic tank where it is suspended from an opening in the tank top. The vault's ports are located between the sludge and scum layers, resulting in effluent quality better than that from compartmented or multiple tanks.

OSI's 1/8-inch mesh polyethylene screen ensures reliable pump operation and keeps solids from clogging distribution pipe orifices.



(CUTAWAY VIEW)
Screened Pump Vault, Float Switches
High-head Pump in Flow Inducer

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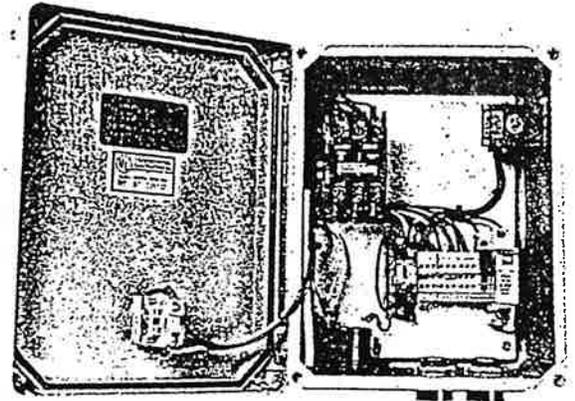
ORENCO SYSTEMS™ SIMPLEX CONTROL PANEL

ORENCO SYSTEMS™ Simplex Control Panels offer fine quality components for reliable automatic pump operation. Standard functions include Circuit Breaker, Manual, Off and Automatic motor control operation plus an audio/visual high-water alarm circuit with audio silence and automatic reset upon correction of the high-water condition.

A selection of optional features offers flexibility for a variety of pumping applications.

ORENCO SYSTEMS™ control panels are specifically engineered for pressure sewer (STEP) systems, for controlling pumping into conventional gravity collection systems and for on-site systems such as intermittent sand filters, recirculating sand filters, low pressure drainfields, as well as for simple uphill pumping to standard drainfields.

ORENCO SYSTEMS™ control panels are especially designed for use with mercury float switches but are compatible with any standard dry-contact switching method.



MODEL S-1



STANDARD FEATURES:

Listing: Underwriters Laboratories

Rating: 1 Hp/115 VAC, 2 Hp/230 VAC, Single Phase, 60 Hz.

Motor-Start Contactor: Rated for 25 FLA, Single Phase, 60 Hz.

Audible Alarm: Panel mount with a minimum of 80 db sound pressure at 24 inches, continuous sound.

Visual Alarm: NEMA 4-rated, 7/8-inch diameter, red lens, oiltight with push-to-silence feature.

Audio-Alarm Reset Relay: 115 VAC, automatic, with DIN rail mount socket base.

Toggle Switch: 15 amp motor rated, single-pole, double-throw with three positions: manual (MAN), (OFF) and automatic (AUTO).

Fuse Disconnect: 2 amp, SLO-BLO fuse with DIN rail mount.

Enclosure: NEMA 4X-rated, fiberglass with hinged cover. Noncorroding. Dimensions: 10" High x 8" Wide x 5-1/8" Deep. External mounting ears.

Alarm Circuit: Wired separately from the pump circuit, so that if the pump's internal overload switch or current-limiting circuit breaker is tripped the alarm system remains functional.

Current Limiting Circuit Breaker: 20 amps, OFF/ON switch, DIN rail mounting (Single Pole/115 V — Double Pole/220 V) with thermal magnetic tripping characteristics.

Padlockable Latch: Constructed of noncorroding stainless steel or reinforced plastic.

OPTIONAL FEATURES:

Elapsed Time Meter: 115 VAC, 7-digit, nonresettable, with DIN rail mount socket base.

Counter: 115 VAC, 6-digit, nonresettable, horizontal base mount.

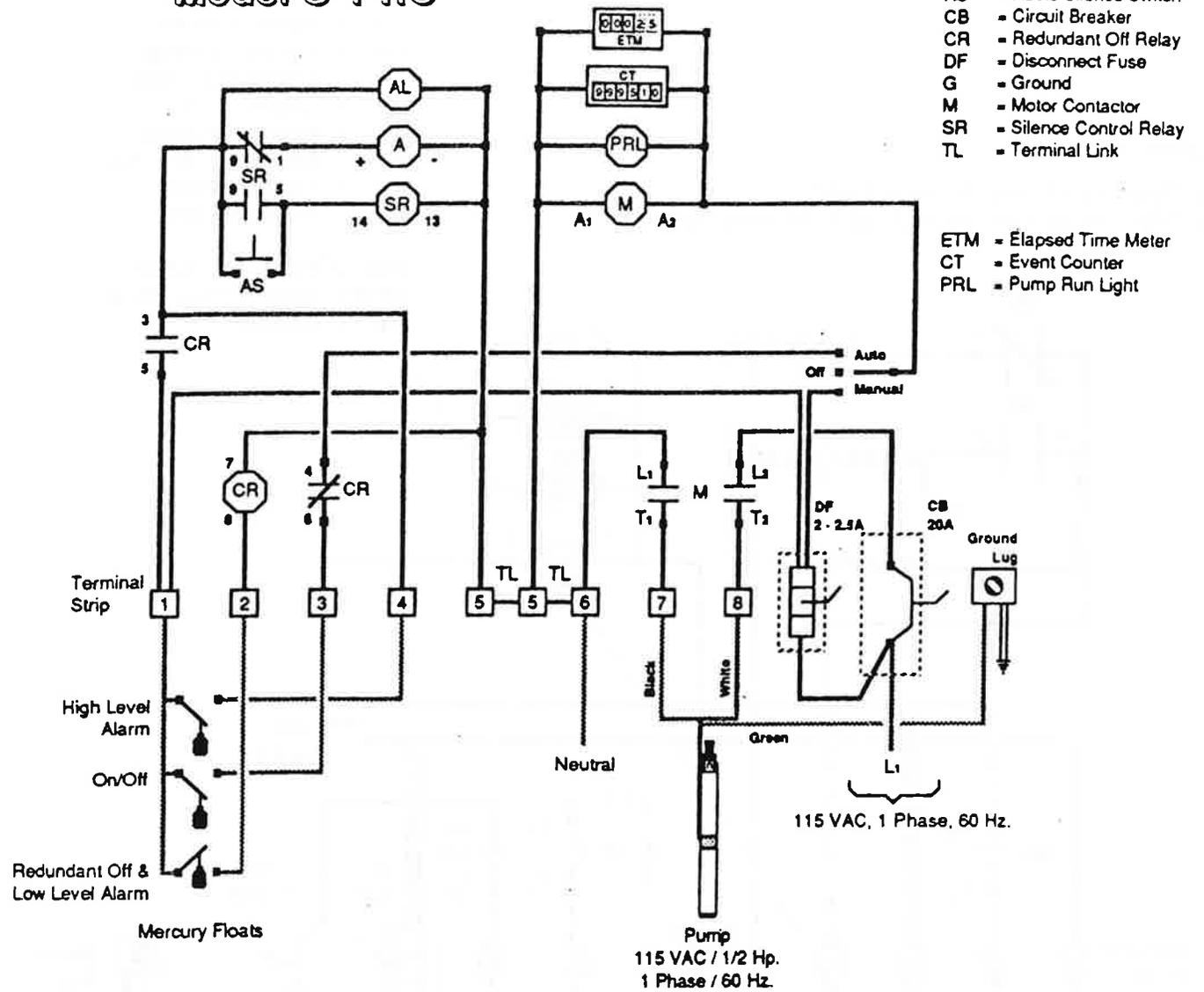
Programmable Timer: 10 amp, 110 VAC, SPDT relay output, repeatable cycle from 15 sec. to 10 hours with two time ranges. Separate variable controls for ON and OFF time.

Intrinsically Safe Control Relay: 115 VAC, 0 to 10,000 ohm sensitivity range. Secondary circuit, 11 VAC, 2.3 mA.

Other custom features can be provided.

Orenco Systems, Inc.

Wiring Diagram Model S-1 RO



Simplex Operation

High Level Activates the high liquid level alarm light and buzzer. The buzzer may be **Alarm:** silenced by pressing the illuminated PUSH TO SILENCE button on the front of the control panel. The alarm light will remain on until the high level condition is corrected.

On/Off: Energizes the motor contactor, which switches ON the power to the pump. The float is in the up position when this occurs. The float de-energizes the motor contactor, which switches OFF the power to the pump, when the float swings down 3 1/2 inches.

Redundant Off & De-energizes the motor contactor, which switches OFF the power to the Low Level pump. This also activates the alarm light and buzzer. The float is in the **Alarm:** down position when this occurs.

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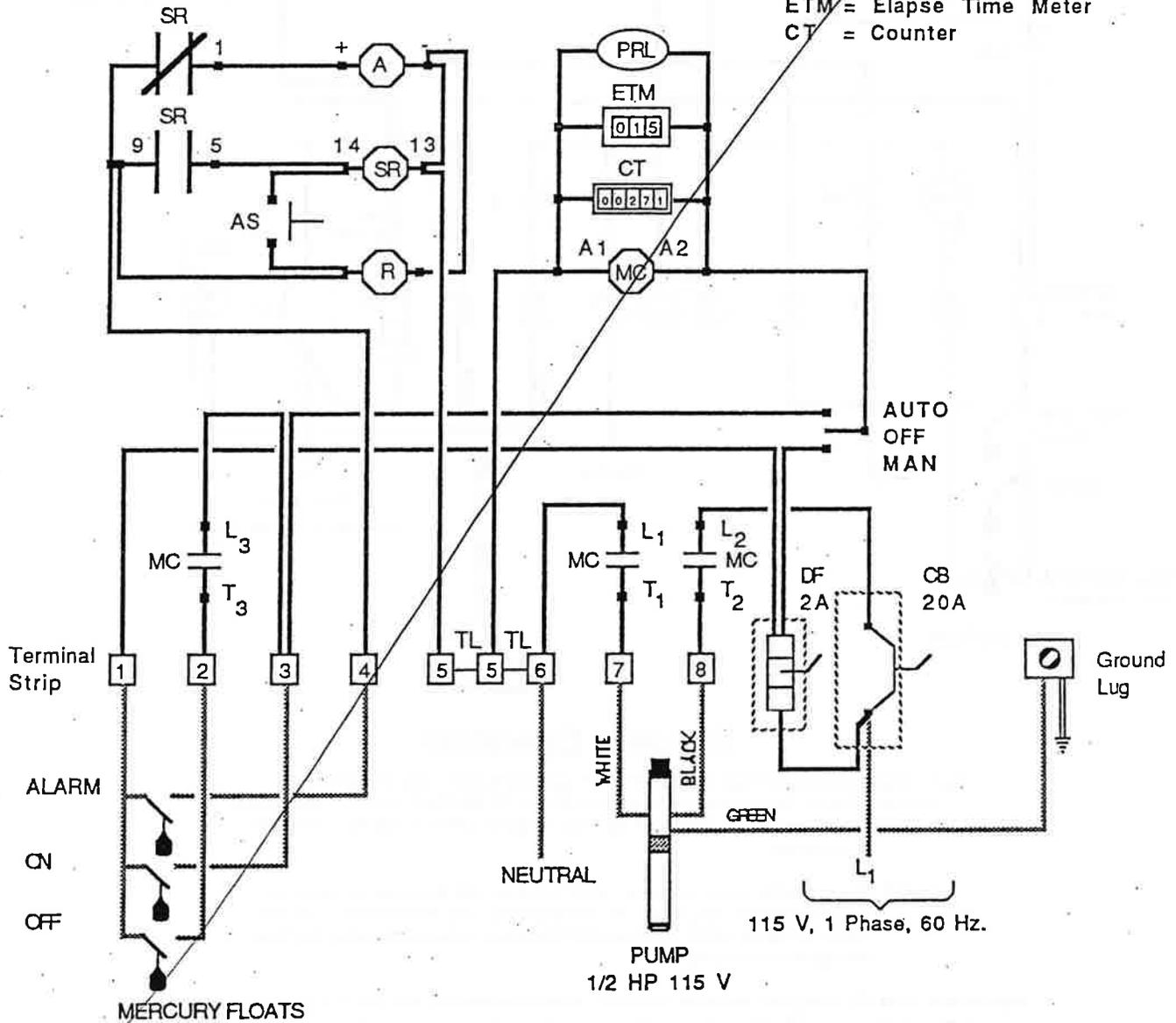
WIRING DIAGRAM MODEL S-1

NOTES:

- 1) Residential Pump Panel 115 VAC
- 2) Motor must have internal overload protection

- = Factory Wire
- - - = Field Wire
- A = Audio 115 VAC
- AS = Audio Silence
- CB = Circuit Breaker
- DF = Disconnect Fuse
- G = Ground
- MC = Motor Contactor
- R = Red Light 115 VAC
- SR = Silence Relay
- TL = Terminal Link

- PRL = Pump Run Light
- ETM = Elapse Time Meter
- CT = Counter



ORENCO SYSTEMS™ CONTROL PANEL	1/01/88
	TB
ORENCO SYSTEMS, INC. 2826 Colonial Road Roseburg, OR 97470 503/673-0165	Drawing NO. 1

INSTALLING Orenco Systems™ RIBBED PVC RISERS

GETTING THE RIGHT HEIGHT

The installed riser should extend about 3 inches above the original ground level (approximately 2 inches for tank settlement and 1 inch to ensure drainage away from the riser).

If it is too long, the riser may be cut. The riser top has a fastening arrangement that accommodates the lid. Risers may be cut at the bottom end using a hand saw. Use masking tape to mark the riser for cutting. To ensure a good fit and a watertight joint, a square cut is absolutely necessary.

If it is too short, a grade ring may be placed under the riser. Generally, it's easiest to bond the grade ring to the top of the tank as described below, then glue the riser to the grade ring using ~~ordinary~~ PVC cement.
epoxy or heavy-bodied

MAKING A WATERTIGHT SEAL

Center the riser over the access hole and mark its position on the top of the tank. Roughen and clean the surfaces of the riser and tank where they are to be joined.

Set the riser in place over the tank opening. Using the two-part epoxy supplied, mixed according to the directions, run a generous fillet completely around the inside of the riser's base.

Allow ample curing time for the epoxy, then backfill and slope the ground surface away from the riser so that runoff will drain away from the tank. Exercise care during the curing period to avoid dislodging the riser or disrupting the watertight seal between the riser and tank.

WORKING IN COLD WEATHER

The epoxy supplied, which cures quickly in very warm weather, needs at least 90 minutes curing time at 60° and often much longer at lower temperatures. Two approaches for successful installation during cold weather are:

1) Set the riser in place on the tank and apply cement grout around the outside of the riser's base. When the grout has set, clean and dry the inside of the riser's base and the adjoining surface of the tank and apply a generous fillet of epoxy. Backfill may be placed when the cement grout is set. Complete curing of the epoxy may take much longer, but will eventually create a watertight seal.

2) Have your local concrete tank maker cast a grade ring into the top of the tank surrounding the access hole at the time of manufacture. The riser can later be bonded to the grade ring with ordinary PVC cement.

ACCESS HOLE TOO BIG?

The Orenco Systems fiberglass tank adaptor converts any oversized opening up to 24" square to an 18" diameter access hole.

The tank adaptor is bonded to the top of the tank using the same two-part epoxy as is used in riser installation.

CAUTION: *An unlocked or open septic tank access is a safety hazard. Always replace lid and lock securely!*

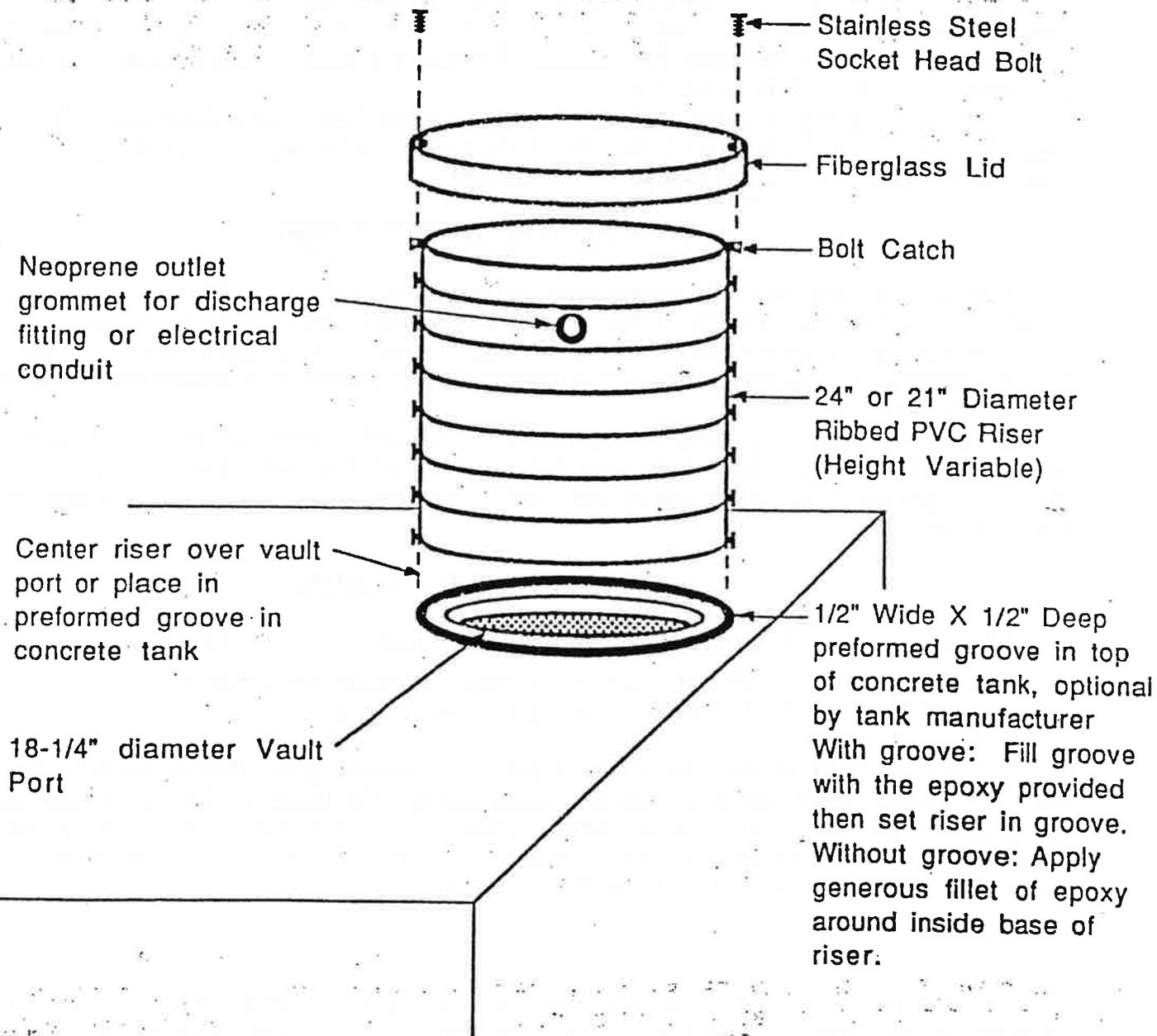


FIGURE 1: VAULT PORT AND RISER DETAIL

OSI © March 1987

EFFLUENT PUMP
8 OSI HH

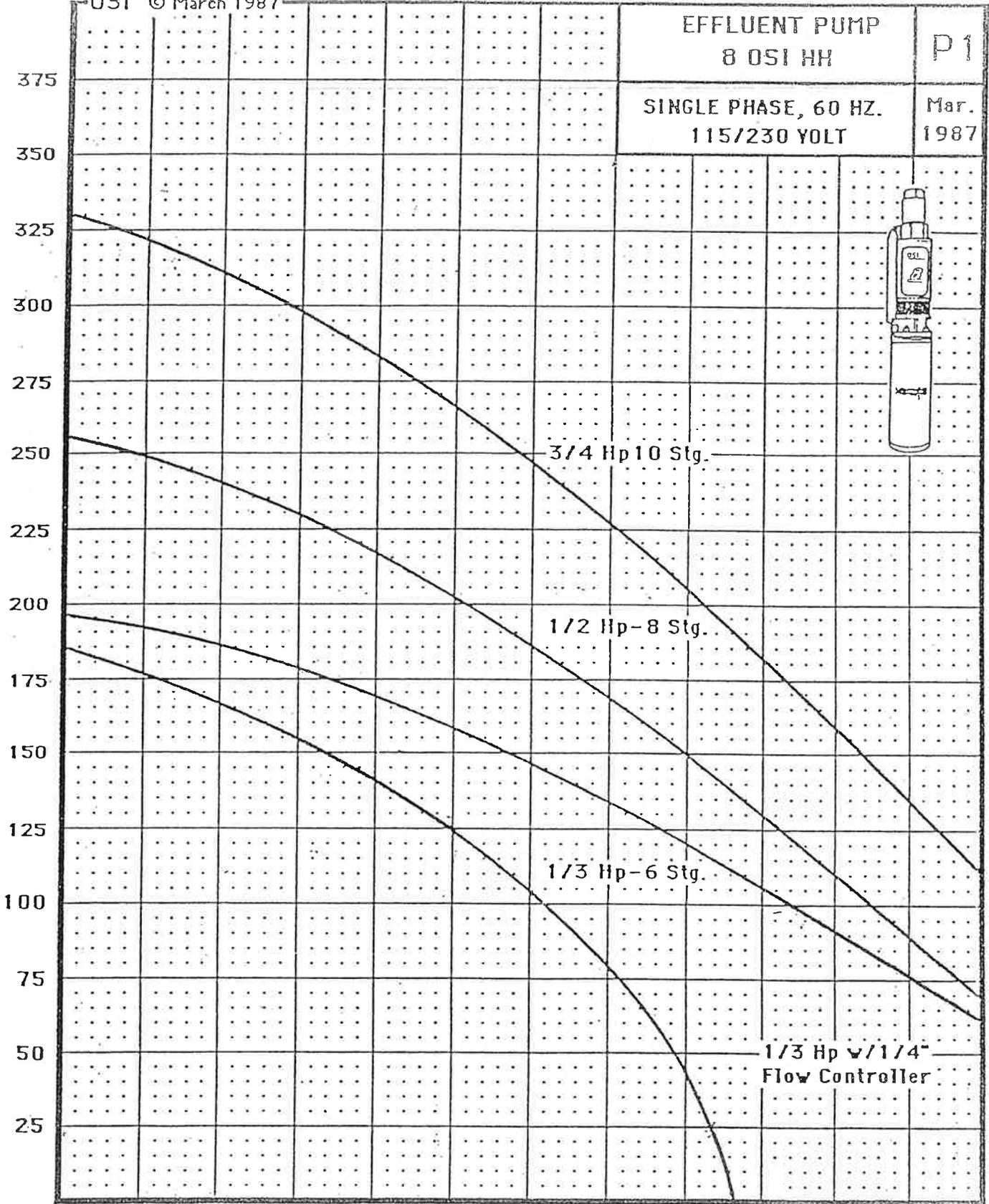
P1

SINGLE PHASE, 60 HZ.
115/230 VOLT

Mar.
1987



TOTAL DYNAMIC HEAD, FEET



NET DISCHARGE, GPM

ORENCO SYSTEMS, INC.

2826 Colonial Road

Roseburg, OR 97470

503/673-0165

Kanaflex®

POOL & SPA HOSE

WORLD-WIDE LEADER IN FLEXIBLE PVC HOSE

SPECIFICATIONS:

SIZE, Inches	OUTSIDE DIAMETER, Inches	WALL THICKNESS, Inches	HELIX HEIGHT, Inches	HELIX WIDTH, Inches	PITCH (spacing), Inches	BEND RADIUS, Inches	WORKING PRESSURE AT 72°F P.S.I.	BURSTING PRESSURE AT 72°F P.S.I.	BURSTING PRESSURE AT 140°F P.S.I.	WEIGHT, Lbs/Ft
1/2"	0.848	.14	—	—	—	3"	100	645	500	.18
3/4"	1.058	.14	—	—	—	4"	100	450	400	.22
1"	1.325	.11	.10	.14	.22	2"	100	355	220	.24
1 1/4"	1.670	.13	.13	.17	.30	4"	80	285	156	.34
1 1/2"	1.912	.13	.13	.17	.30	4"	70	270	128	.44
2"	2.387	.16	.15	.20	.34	5"	64	230	100	.63

- For use with PVC solvent weld fittings only.
- Temperature range is -13° to 158°F.
- Inside diameter is nominal.
- Tolerance on outside diameters is ± .020"
- Vacuum rating on sizes 1" thru 2" is 29.8" HG @72°F.
- Since 1/2" is braided tubing—helix information does not apply.

The Kanaflex brand of Pool and Spa Hose is assurance to your customers that you care about quality installations. In addition to substantially reducing time on each job you also save up to 50% of the fittings required when compared to using rigid PVC pipe.

Kanaflex Pool and Spa Hose is designed for use with PVC solvent weld fittings only. Temperature range is from -13° to 158°F. In addition to the standard 1 1/2", Kanaflex is also available in 1/2", 3/4", 1", 1 1/4", and 2" sizes.

Kanaflex Pool and Spa Hose is made by the world's leading producer and originator of flexible PVC hose. Serving industry from 21 plants world-wide, Kanaflex Corporation has been producing hose of uncompromising quality for over 30 years—holding many of the patents on manufacturing processes.

When making pool and spa installations be sure you use the PVC hose with the Kanaflex brand.

INSTALLATION NOTE: Although we recommend the use of a primer prior to applying a quick-dry cement, please contact your glue supplier for recommendations as well.

Kanaflex

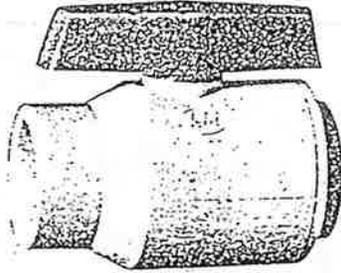
Corporation

750 W. MANVILLE, COMPTON, CA 90220
 P.O. BOX 4638, COMPTON, CA 90224
 (213) 637-1616 / (800) 421-2450 / TELEX 69-1222
 70 E. MESSNER DR., WHEELING, IL 60090
 (312) 459-0390 / (800) 323-6327

SHOP DRAWING REVIEW	
ARCHITECT/ENGINEER REVIEW	
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PSOMAS AND ASSOCIATES BY: <i>[Signature]</i>	DATE: _____

WATER LO-TORQUE™ BALL VALVES

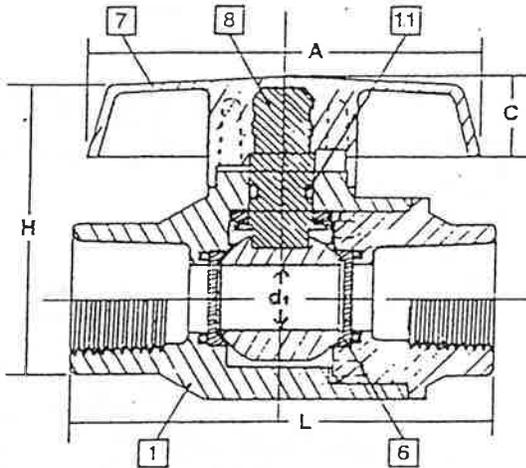
Patent No. 4,665,937



SPECIFICATIONS:

- Low torque required to operate unit manually.
- Seals are self-adjusting to compensate for wear.
- Patented feature — “pre-loaded” stem seal for longer life of seal.
- Precision molded micro-finish ball provides longer life.
- Body made of white PVC Type I with ABS Handle.
- Meets ASTM standards & schedule 80 requirements.
- EPDM stem seal.
- Made by KBI in the U.S.A.

	MODELS	
	Socket	Thread
½"	WLT-500-S	WLT-500-T
¾"	WLT-750-S	WLT-750-T
1"	WLT-1000-S	WLT-1000-T
1¼"	WLT-1250-S	WLT-1250-T
1½"	WLT-1500-S	WLT-1500-T
2"	WLT-2000-S	WLT-2000-T

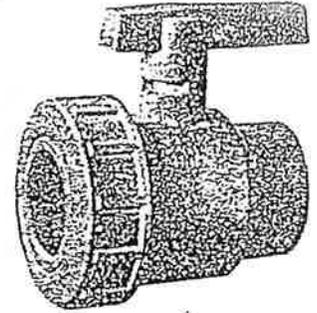


DIMENSIONS						
Nominal Size (INCHES)	d ₁	L	H	C	A	Approx. Weight Ea. (LBS.)
½"	.55	3.22	2.57	.65	3.01	.25
¾"	.75	3.81	3.13	.80	3.64	.44
1"	1.00	4.38	3.56	.96	4.23	.59
1¼"	1.25	5.39	4.60	1.12	4.99	1.50
1½"	1.50	5.39	4.60	1.12	4.99	1.31
2"	2.00	6.66	5.90	1.31	6.00	2.75

NOTE: Boxed numbers on dimensional drawings refer to "Materials of Construction" Chart on page 10.

WATER SINGLE UNION BALL VALVES

KING BROS.
Presents
FASTORE



SPECIFICATIONS:

- Body, ball and handle made of white PVC Type I.
- 1/4 turn shutoff to open and close with stops at both positions.
- Full flow, same as equivalent pipe size.
- Polyethylene ball seats and EPDM stem seal provide long wear and chemical resistance properties.
- Deep sockets on both ends, exceed ASTM requirements, providing additional bonding surface in cementing pipe in valve.
- Valve meets or exceeds ASTM schedule 40 requirements.
- Single union allows proper positioning of valve.
- Patent pending ball design provides smooth and easy manual operation.

MODELS		
SPEY DRAWING WSL-1700-S	Slide x Slip	
RELECT ENGINEER WSL-2000-S	Slide x Slip	

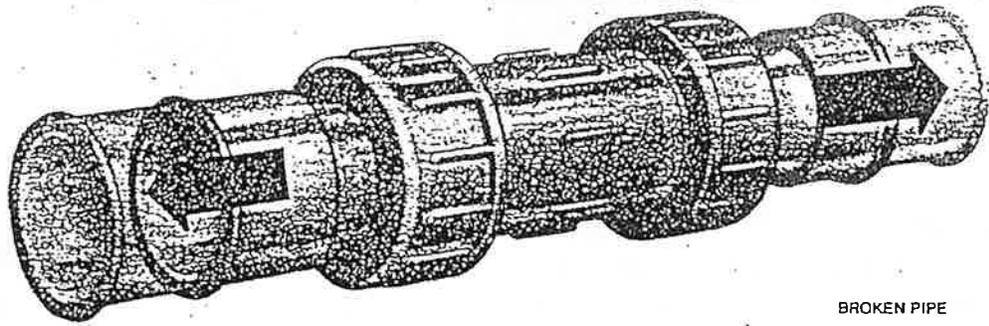
No Exception Taken
 Make Corrections Noted
 Amend and Resubmit
 Rejected

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PSOWAS ASSOCIATES
 BY: *[Signature]* DATE: 3/23/89

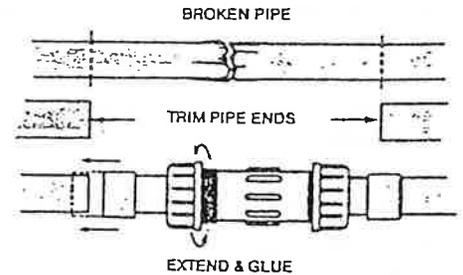
DIMENSIONS				
Nominal Size (INCHES)	D	A	B	L
1-½"	1-½"	2.69	5.25	5.50
2"	2"	3.19	6.30	6.00

QUIK-FIX™ DOUBLE EXTENSION COUPLINGS



Sizes 1/2" - 6"

The QUIK-FIX Double Extension Coupling is used for the repair of pipe, and with the replacement of valves and fittings in an existing PVC system without digging up large sections of pipe.



- Both ends of coupling extend or telescope for ease of installation to desired length.
- No additional fittings needed to install.
- Units are sealed with **SANTOPRENE™** gaskets at both ends.
- Constructed of rugged Type I PVC with schedule 40 socket connections.
- When installing, restrain all pipe movement by soil compaction on straight runs and thrust blocking when reducing size or changing direction.
- "BIG RED" Compression Strap Wrench is recommended for tightening of couplings.
- Working pressure rated at 150 psi.

MODELS		
1/2"	QF-500	Slip x Slip
3/4"	QF-750	Slip x Slip
1"	QF-1000	Slip x Slip
1-1/4"	QF-1250	Slip x Slip
1-1/2"	QF-1500	Slip x Slip
2"	QF-2000	Slip x Slip
2-1/2"	QF-2500	Slip x Slip
3"	QF-3000	Slip x Slip
4"	QF-4000	Slip x Slip
6"	QF-6000	Slip x Slip

SHOP DRAWING REVIEW

ARCHITECT/ENGINEER REVIEW

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 Rejected

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BY: *[Signature]* DATE: *[Date]*

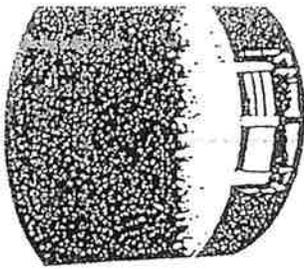
PVC SCHEDULE 80 UNIONS



- Available 1/2" - 2".
- Slip or thread connections.
- Rugged PVC construction.
- EPDM O'rings.
- Temperature range of -20°F to 150°F.
- Meets ASTM schedule 80 standards.

MODELS		
3/4"	U-750-S	Slip x Slip
3/4"	U-750-T	FIPT x FIPT
1"	U-1000-S	Slip x Slip
1"	U-1000-T	FIPT x FIPT
1-1/4"	U-1250-S	Slip x Slip
1-1/4"	U-1250-T	FIPT x FIPT
1-1/2"	U-1500-S	Slip x Slip
1-1/2"	U-1500-T	FIPT x FIPT
2"	U-2000-S	Slip x Slip
2"	U-2000-T	FIPT x FIPT

Replacement O'rings available



Heyco® Liquid-Tight Fittings

ARCHITECT/ENGINEER REVIEW

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- Make Corrections Noted
- Approved and Resubmit
- Rejected

This drawing for general conformance with the design concept and construction shall be construed as relieving the Contractor of any responsibility for deviations from specifications, nor departures therefrom, and accuracy, for confirming and certifying quantities and dimensions for construction processes, for technical assistance, and for any other work in a safe manner.

UL Recognized under the Component Product Listing Program File #E-51579 Certified by Canadian Standards Association
#5482

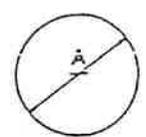
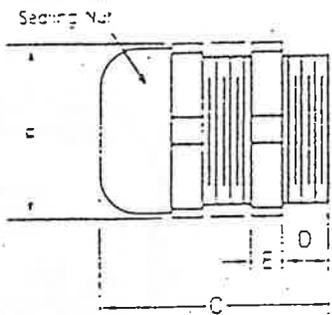
PSOM'S AND ASSOCIATES
BY *[Signature]* DATE *[Date]*

INSTALLS IN EITHER CLEARANCE or THREADED HOLES

PART NO.		Diameter of Cables/Tubing Accommodated. We recommend the minimum size that will still accommodate your application.	Type Thread and Size	DIMENSIONS							
Black	Gray			Major Dia. mm.	BODY AND SEALING NUT					LOCKING NUT	
					A Clearance Hole $+0.10$ -0.000	C Max. O.A. Length	D Thread Length	E Wrenching Nut Thickness	F Wrenching Flats	G Thickness	H Wrenching Flats
3207	3208	090-265"	2 5/8"	492"	1-11 64"	5 16"	13.64"	19 32"	7 32"	3 4"	
3444	3445	079-197"	2 3/8"								
3228	3229	187-312"	3 8 NPT	675	1-5 8	27 64	13.64	7 8	No Nut Provided		
3458	3459	079-236"									
3210	3211	187-312"	2 3/8"	599	1-11 32	5 16	13.64	3 4	7 32	55 64	
3446	3447	079-236"									
3213	3214	231-394"	2 5/8"	733	1-29 64	5 16	13.64	7 8	7 32	15 16	
3448	3449	118-275"									
3237	3232	270-480"	1 2 NPT	825	1-27 64	17 32	13.64	15 16	No Nut Provided		
3224	3238	197-354"									
3218	3217	270-480"	2 3/8"	504	1-17 32	23 64	13 64	15 16	1 4	14 16	
3450	3451	197-354"									
3219	3220	428-546"	2 3/8"	366	1-21 32	25 64	15 64	14 16	1 4	14 64	
3452	3453	236-512"									
3234	3235	545-709"	3 4 NPT	1050	1-31 32	9 16	15 64	15 16	No Nut Provided		
3460	3461	354-629"									
3222	3223	545-709"	2 3/8"	115	1-33 64	7 16	15 64	1-19 64	9 32	1-13 32	
3454	3455	354-629"									
3225	3226	709-1000"	2 3/8"	1470	2-3 32	7 16	5 16	1-21 32	9 32	1-13 16	
3456	3457	472-787"									

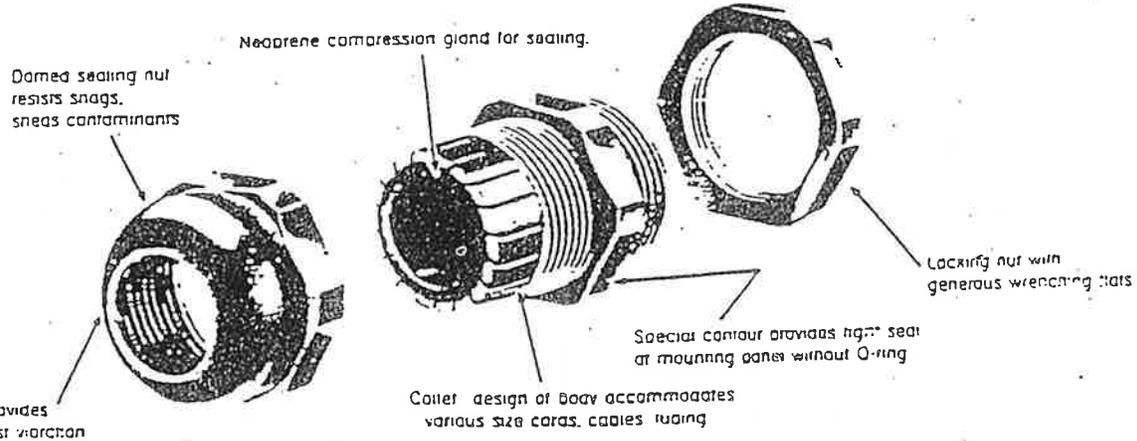
- V.D.E. accepted. SEV #302903(M)
- Ten sizes for cable, tubing, etc. with diameters ranging from 3/32" to 1"
- All nylon construction with neoprene gland
- Resistant to salt water, weak acids, gasoline, alcohol, oil, grease and common solvents
- Working temperatures: -30°C (-22°F) to 100°C (212°F) For short periods to 150°C (302°F)
- Withstands water pressure up to 7 MPa

LabKits for prototype use are available. See page 27



Suggested Clearance Hole For Non-Threaded Mounting

Standard Colors: Black or Gray
Material: Nylon 6/6, Conduit: Threads per ANSI B1.13.1



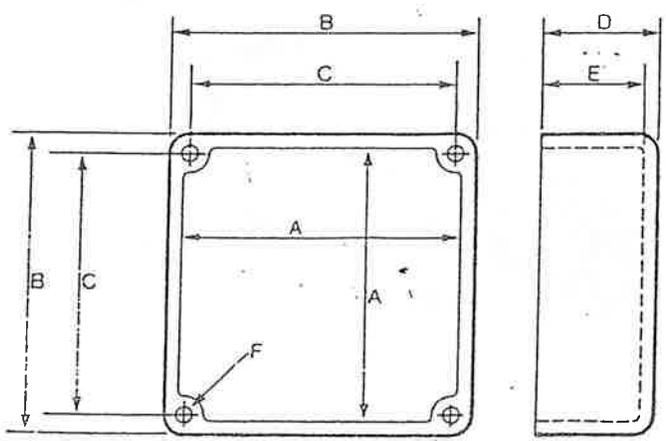
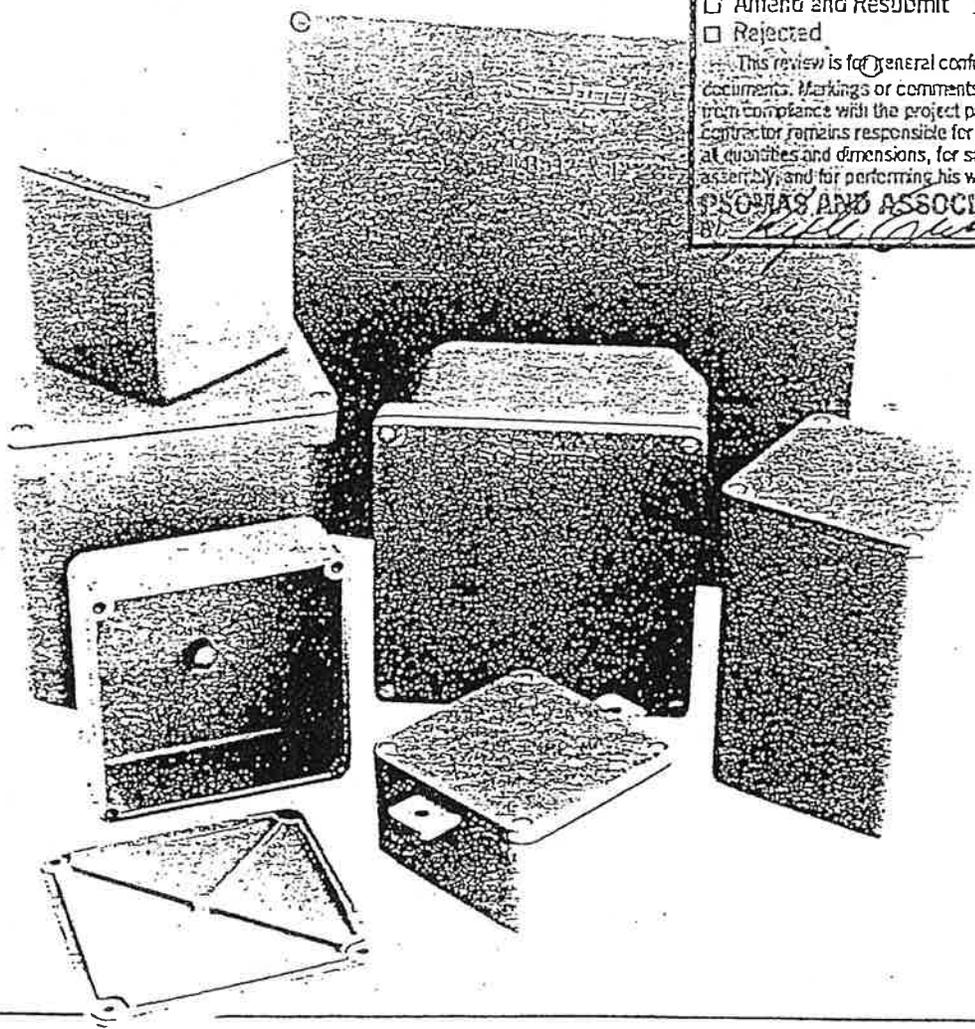
Internal ratchet provides self-locking against vibration

PVC MOLDED JUNCTION BOXES



MANUFACTURING CO. LTD.

SHOP DRAWING REVIEW	
ARCHITECT/ENGINEER REVIEW	
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PSOLIAS AND ASSOCIATES BY <i>Will Quinn</i>	DATE <i>8/23/89</i>



Part No.	A	B	C	D	E	F
JB442	3.675	4.000	3.45	2.30	2.00	8-32
JB444	3.675	4.000	3.45	4.188	3.75	8-32
JB446	3.675	4.000	3.45	6.225	6.000	8-32
JB552	4.680	5.000	4.485	2.000	1.845	8-32
JB664	6.000	6.375	5.813	4.88	4.00	10-24
JB666	6.000	6.375	5.813	6.188	6.00	10-24
JB884	8.075	8.625	7.966	4.230	4.005	10-24
JB887	8.100	8.625	7.966	7.250	7.035	10-24
JB12124	12.085	12.580	11.874	4.256	4.030	10-24
JB12126	12.085	12.580	11.874	6.240	6.025	10-24

PVC MOLDED FLANGED JUNCTION BOXES

SHOP DRAWING REVISION

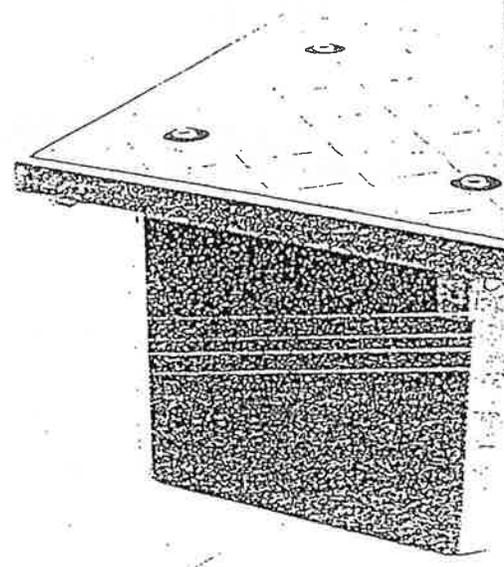
ARCHITECT/ENGINEER REVIEW

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PSCARIS AND ASSOCIATES

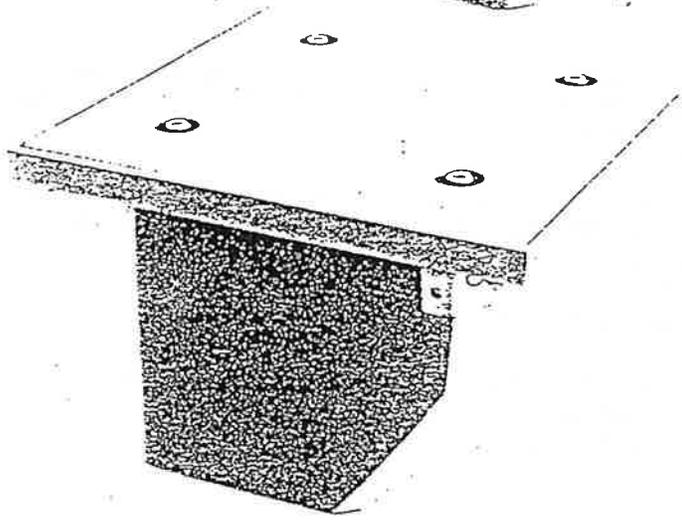
8/23/89



FLANGED BOX WITH FIBRE REINFORCED SAFETY TREAD COVER

INSIDE DIMENSION

Length	Width	Depth	Part No.
6"	6"	4 1/4"	H 664
6"	6"	6 1/4"	H 666
8"	8"	4 1/4"	H 884
8"	8"	6 1/4"	H 886
8"	8"	7 1/4"	H 887



FLANGED BOX WITH FIBREGLASS SAFETY TREAD COVER

INSIDE DIMENSION

Length	Width	Depth	Part No.
8"	8"	7 1/4"	H887-A

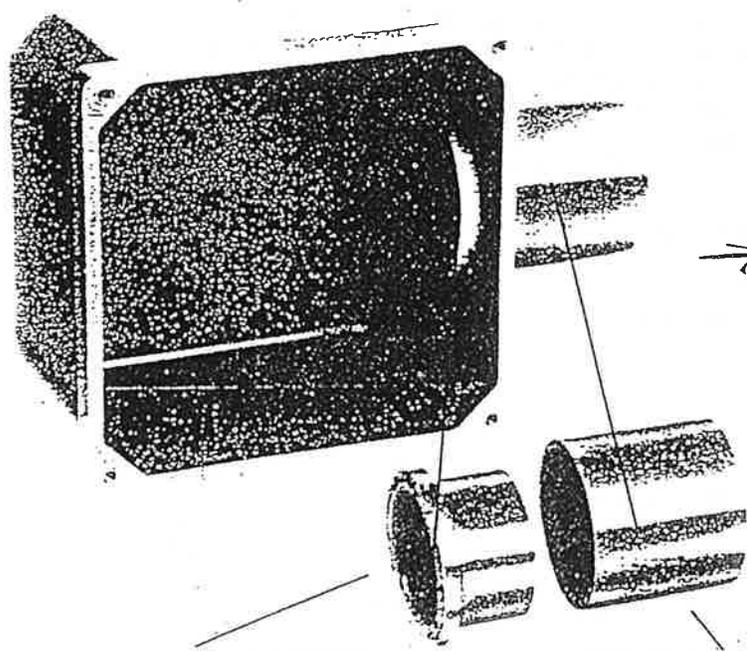
FABRICATED BOXES

Unflanged PVC fabricated boxes of any size may be made to customers specifications and come complete with lids, gaskets and screws.

These boxes are not C.S.A. certified and are not returnable.

JUNCTION BOX ADAPTERS

Size	Part No.
1/2"	JBA 10
3/4"	JBA 15
1 "	JBA 20
1 1/4"	JBA 25
1 1/2"	JBA 30
2 "	JBA 35
2 1/2"	JBA 40
3 "	JBA 45
3 1/2"	JBA 50
4 "	JBA 55



JUNCTION BOX ADAPTOR

STANDARD PVC COUPLING



WELD-ON

PRODUCT BULLETIN • SPECIFICATIONS

WELD-ON 10

A REACTIVE HIGH STRENGTH ADHESIVE
FOR JOINING PVC AND CPVC PLASTICS

GENERAL DESCRIPTION

Weld-On 10 is a two-part, opaque white, thick syrupy, high strength plastic resin adhesive. After mixing Component A (Base Resin) with Component B (Catalyst) Weld-On 10 is ready to be applied to mating surfaces. Pot life of the mixture is about 30 minutes at 75°F. Working time is often shorter than the pot life, because the resin surface air dries to form a thin skin during application. The resin layer cures initially to a hard gel in about 2 hours and reaches near ultimate strength in 24 hours at 70°F. The cured layer is a tough, chemical and water resistant plastic. Note: *Cure will be faster in warmer weather, slower in cold weather.*

PRODUCT USES:

Weld-On 10 was especially formulated for joining, fabricating and repair of large size PVC and CPVC pipe and fittings. It can also be used for joining PVC or CPVC to other materials, such as metals, concrete and clay . . . or to join dissimilar plastics, such as fiberglass reinforced polyester (FRP), ABS, acrylic, polycarbonate and styrene.

Weld-On 10 is unexcelled for joining very large sizes of PVC pipe and fittings, *where fits are loose enough to have gaps.* It is not recommended for joints with interference fits.

- It provides excellent adhesion in peel, tensile or sheer applications with PVC and CPVC . . . withstands very high pressure.
- Fills gaps too large for solvent cement to fill.
- Allows time for careful workmanship in fabricating, joining or repair of very large diameter pipe and fittings. It is ideal for installing large saddles or valve connections.
- Although it hardens to a rigid plastic, it is tough enough to resist impact.
- Forms superior bonds between PVC and other materials . . . plastics and non-plastics . . . to cast iron, galvanized, concrete, aluminum or clay pipe or fittings.

DIRECTIONS FOR USE:

1. Assemble materials for the job — Weld-On 10 A & B, mixing sticks, applicator (spatula or stiff brush), sandpaper, clean wiping cloths, cleaning solvent and gloves.
2. Prepare joint by sanding to roughen mating surfaces. Wipe surfaces clean with dry rag or with solvent cleaner. *Do not soften plastic with solvent cleaner.*
3. With pre-measured Weld-On kit add Catalyst B (small container) to Resin A (large container). Mix thoroughly and apply to each mating surface. Pot life and working time is about 30 minutes at 70°F.
4. Assemble parts and allow squeeze out to remain as a fillet.
5. Do not disturb joint for at least 2 hours at 70°F. Warmer weather will shorten pot life and cure time. Colder weather will increase time for both.
6. When joining CPVC for service temperatures of over 150°F, please contact us for more information.

REPAIR WITH WELD-ON 10

Weld-On 10 has had considerable field history in the repair of leaks. We have had many reports of very satisfactory results. We have also made our own test repairs with Weld-On 10 on 4" diameter Schedule 40 PVC pipe with excellent results. All repairs provided leak free service at full rated pressure for 5 weeks without failure. Pressure was then increased to burst pressure of the pipe and the repairs did not fail. From these results we would expect that field repairs should provide durable, leak-free service, depending on the quality of the repairs.

Here are our suggestions for making repairs with Weld-On 10:

- (1) Have materials ready... sufficient quantity of Weld-On 10; a clean stick for mixing; a spatula or stiff brush for applying Weld-On 10; fiberglass* cloth mat cut to desirable size or strip for wrapping; sandpaper or emery, clean, dry rags, gloves for protection. (2) Turn off water pressure; dry off the area of bond and abrade it well with sandpaper and wipe clean. (3) Mix Weld-On 10 as a pre-measured kit. Add small bottle of "B" to larger container of "A" and mix thoroughly. (4) Apply a generous coat of Weld-On 10 to leak and surrounding area. (5) Apply Weld-On 10 to mating surface of cloth and wrap around leak area. Some adhesive should squeeze up through cloth. (6) Apply an additional coat of Weld-On 10 to the top surface. (7) Allow to cure a minimum of 4 hours at 75°F. Overnight or 24 hours cure would be more desirable before re-pressurizing the systems.

*We obtained good results with only Weld-On 10 and no fiberglass cloth, but we recommend the cloth for added structural strength.

STORAGE/SHELF LIFE:

Both components should be stored between 45°F and 85°F, and 12 months shelf life can be expected.

SAFETY PRECAUTIONS:

**FLAMMABLE — VAPOR HARMFUL — HARMFUL IF SWALLOWED
IRRITATES SKIN OR EYES**

Keep out of the reach of children. Do not take internally. Use with adequate ventilation. Avoid prolonged breathing of vapor. In confined or partially enclosed areas, a ventilating device should be used. Respirators especially designed to minimize the inhalation of organic vapors can also be used. They are commercially available. Avoid contact with skin or eyes. May cause eye injury. For protection use rubber gloves and safety goggles. In case of contact with skin or eyes, flush with plenty of water for 15 minutes and call a physician immediately. Wash contaminated clothing before re-use. If swallowed induce vomiting and call a physician. Keep away from heat, sparks and open flame. Keep container closed when not in use. Observe industrial safety practices. Contains acrylic monomer. For industrial use only.

QUALITY ASSURANCE:

Every batch of this cement is checked to assure that consistent quality is maintained. An infra red absorption curve is recorded for each batch to ensure that this cement is properly formulated. A sample is taken from all batches and kept for a period of at least one year.

IMPORTANT NOTE:

Our suggestions and data are based on information we believe to be reliable. Users should verify by tests that this product, as well as these methods, are suitable with the product being used in their application. Since specific use, materials and handling are not controlled by IPS, our warranty is limited to the replacement of defective IPS products.

3-D-D DRAWING REVIEW	
ARCHITECT/ENGINEER REVIEW	
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<input type="checkbox"/>	Make Corrections Noted
<input type="checkbox"/>	Amend and Resubmit
<input type="checkbox"/>	Rejected
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PSORAS AND ASSOCIATES	
BY <u>[Signature]</u>	DATE <u>8/23/89</u>

• IPS - Copyright 1982

INDUSTRIAL POLYCHEMICAL SERVICE • 17109 S. MAIN • P. O. BOX 379 • GARDENA, CALIFORNIA 90247-0579 • PHONE (213) 321-6515
MANUFACTURERS AND FORMULATORS OF ADHESIVE CEMENTS FOR EPOXY • VINYL • NYLONS • ACRYLICS • FIBRE GLASS • POLYESTER • ABS
FOAMS • BUTYRATE • STYRENE • URETHANE-CELLULOSE • ETC ALSO RUBBER • WOOD • METAL • MASONRY • GLASS • CERAMIC • MANY OTHERS

A-10 0232

MINI-SENSOR™ Control Switch

A compact float switch designed to activate pump control panels, solenoids, relays, etc.

ADVANTAGES

- Two models available
MPC (Pipe Clamp)
MWE (External Weight)
- Single pole, heavy-duty mercury tilt switch epoxy encapsulated in a compact non-corrosive PVC plastic float.
- Two-year limited warranty.

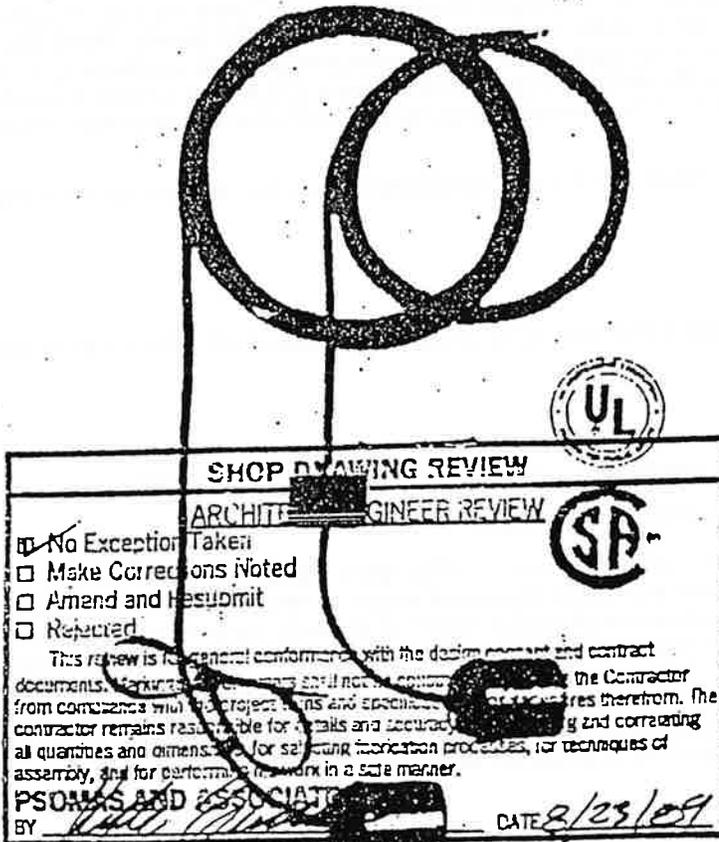
DESCRIPTION

Both Mini-Sensor Float models are rated 13 amps (120V A.C. or 230V A.C.). The heavy-duty, mercury activated tilt switch and the cord conductors are epoxy sealed in a watertight, impact-resistant float housing. The mercury tilt switch (manufactured by S.J. Electro Systems, Inc.), activates when the float reaches the horizontal position.

Two models provide for flexibility in installation.

MPC (Pipe Clamp): The MPC must be installed by strapping the pipe clamp at the desired activation level to a discharge pipe or other similar mounting.

MWE (External Weight): The MWE has an adjustable weight attached to the cable. The MWE is used in applications where the float is suspended from above.



APPLICATIONS

Mini-Sensor floats may be used to activate pump control panels, solenoids, and relays. This liquid level control is frequently used in sewage systems, irrigation systems, and in other water systems.

SPECIFICATIONS

MODEL: 10MPC N.O.	NORMALLY	10MPC N.C.	NORMALLY
10MWE N.O.	OPEN	10MWE N.C.	CLOSED

NOTE: Numbers preceding model designation (MPC or MWE) refer to cable length. The Mini-Sensor Float control switch is available in standard length of 10 ft. (3.04m), 15 ft. (4.57m), 20 ft. (6.09m), 30 ft. (9.14m), 40 ft. (12.19m) and 50 ft. (15.24m). Other lengths are available. (Please specify length required.)

CABLE: Flexible 16 gauge, 2 conductor (UL) SJOW-A-SJOW (CSA) Neoprene, water-resistant.

EXTERNAL WEIGHT: 2 lbs. of cast iron.

FLOAT: 2.812 inch (7.142cm) diameter x 3.42 inch (8.686cm) long, high-impact resistant, non-corrosive plastic for use in liquids up to 140° F (60° C).

MERCURY TILT-SWITCH: Heavy duty mercury-to-metal contacts

ELECTRICAL RATED: 13 Amp 120V.A.C. or 230V.A.C.

JOY[®] TP Mini-Line[™] Connectors...

Electrical Parameters

2 to 5 Contacts,
#16 AWG Conductors,
Up to 600 Volts, 13 Amps.

Tough JOY TP Mini-Line connectors are designed to provide dependable and economical service. The use of compact limit and proximity switches, solenoid valves, and other small components creates space problems the JOY TP Mini-Line connector can solve.

TP Mini-Line connectors eliminate time consuming rewiring of equipment on the job. Components can be quickly replaced by simply unplugging the defective unit and plugging in a prewired spare. Wire portable equipment just once, then connect it and disconnect it at will. Rugged, sealed construction allows use in toughest industrial environments.

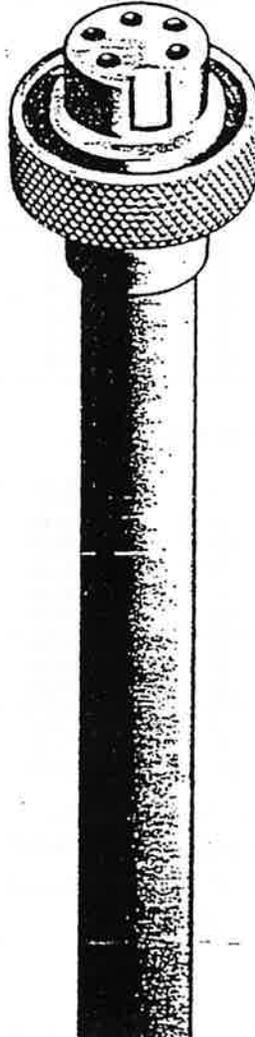
JOY TP Mini-Line connectors are factory molded, from high-quality thermoplastic rubber compounds, to various standard lengths of cable and are available in two through five contacts.

Designed for safe operations

Molded of thermoplastic rubber, TP Mini-Line connectors offer excellent electrical insulation. Male contacts are shielded by a skirt during connect and disconnect operations. Polarized keyway facilitates correct pin engagement. A molded-in alignment arrow on the shrouded male plug indicates alignment with the keyway so that even in the dark, keyway alignment is made easier. All socket contacts are recessed from the connector face to prevent accidentally touching live contacts. The ground pin makes contact first and breaks contact last.



- Economical To Use
- Reduce Installation Costs
- Provide Long Reliable Service
- Protect Against Harsh Environments



Save space and withstand rugged operating conditions



Sealed against environment

Molded-to-cable design and double-face seal are unaffected by water, coolants or condensation. Female half fits like a cork into the flexible shroud portions of the male. In addition, individual shoulders around the pins fit into recesses in the female sections. The thermoplastic rubber used has excellent weathering properties and is specifically selected for outdoor application. The cable used is also selected for outdoor use and passes UL 1581 for sunlight resistance.

Withstand physical abuse

The one-piece molded thermoplastic rubber construction shrugs off heavy physical abuse. They will withstand many times the twisting and flexing of conventional connectors.

Highly visible

Plugs and receptacles are molded with yellow thermoplastic rubber compound. Plugs are supplied with yellow jacketed cable.

Positive lockings

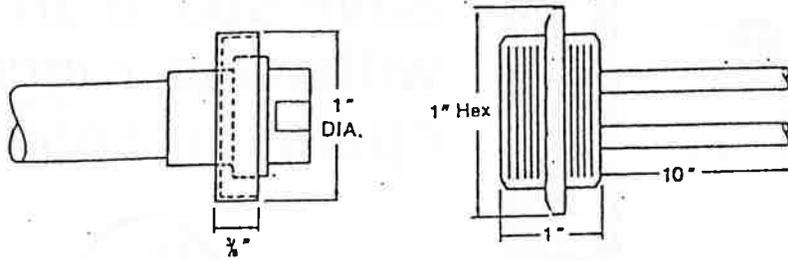
Threaded couplings insure tight connections — release quickly.

Corrosion resistant

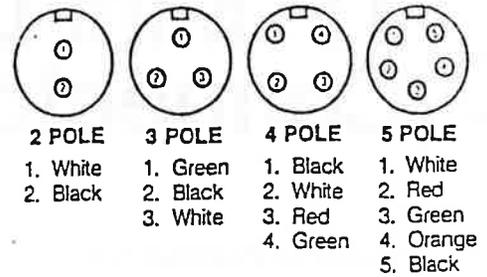
Thermoplastic rubber components are impervious to most industrial environments. Mounting shells and couplers are metal or nylon.

Easily installed

Receptacles are threaded at rear to fit standard pipe threads.



Face View of Male



Typical Plug	Typical Receptacle
SHOP DRAWING REVIEW	
ARCHITECT/ENGINEER REVIEW	
<input checked="" type="checkbox"/> No Exception Taken <input type="checkbox"/> Make Corrections Noted <input type="checkbox"/> Amend and Resubmit <input type="checkbox"/> Rejected	
<p>This review is for general performance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The contractor remains responsible for details and quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing the work in a safe manner.</p>	
ORDERING INFORMATION	
PROGRAM AND ASSOCIATES DATE 8/23/81	

WITH METAL COUPLER AND RECEPTACLE SHELL

ELECTRICAL DATA					PLUGS			RECEPTACLES (10" Pigtails)		
No. of Contacts	Maximum Rating (Cable)				Length Feet	* Male	* Female	Male	Female	Pipe Thread Size
	Volts	Amps	AWG	Cable Type						
2	600	13	16	SEOW-A	3	5000108-6	5000108-3	5000108-10	5000108-9	1/2
					6	5000108-7	5000108-4			
					12	5000108-8	5000108-5			
3	600	13	16	SEOW-A	3	5000109-6	5000109-3	5000109-10	5000109-9	1/2
					6	5000109-7	5000109-4			
					12	5000109-8	5000109-5			
4	600	10	16	SEOW-A	3	5000110-6	5000110-3	5000110-10	5000110-9	1/2
					6	5000110-7	5000110-4			
					12	5000110-8	5000110-5			
5	250*	8	16	SEOW-A	3	5000111-6	5000111-3	5000111-10	5000111-9	1/2
					6	5000111-7	5000111-4			
					12	5000111-8	5000111-5			

WITH NYLON COUPLER AND RECEPTACLE SHELL

2	600	13	16	SEOW-A	3	5000108-28	5000108-25	5000108-18	5000108-17	1/2
					6	5000108-29	5000108-26			
					12	5000108-30	5000108-27			
3	600	13	16	SEOW-A	3	5000109-28	5000109-25	5000109-18	5000109-17	1/2
					6	5000109-29	5000109-26			
					12	5000109-30	5000109-27			
4	600	10	16	SEOW-A	3	5000110-28	5000110-25	5000110-18	5000110-17	1/2
					6	5000110-29	5000110-26			
					12	5000110-30	5000110-27			
5	250*	8	16	SEOW-A	3	5000111-14	5000111-11	5000111-18	5000111-17	1/2
					6	5000111-15	5000111-12			
					12	5000111-16	5000111-13			

Accessories

Adaptor -1316511

Threaded Aluminum Adaptor to couple Male and Female Plugs

Dust Cap with Chain for Receptacle - 3316582-1

Dust Cap with Chain for Plug - 3316582-2

Note: Refer to price list for identification of stock items.
 Temperature Rating 90°C
 Pressure Rating 30 PSIG on Receptacle
 *Wire and Cable rated at 600 V



IVO INDUSTRIES, INC.
 201 INDUSTRIAL WAY WEST
 EATONTOWN, N.J. 07724
 PHONE: 800-932-0489
 IN.N.J.: 201-542-5151
 TELEX: 132-414
 FAX: 201-542-2938

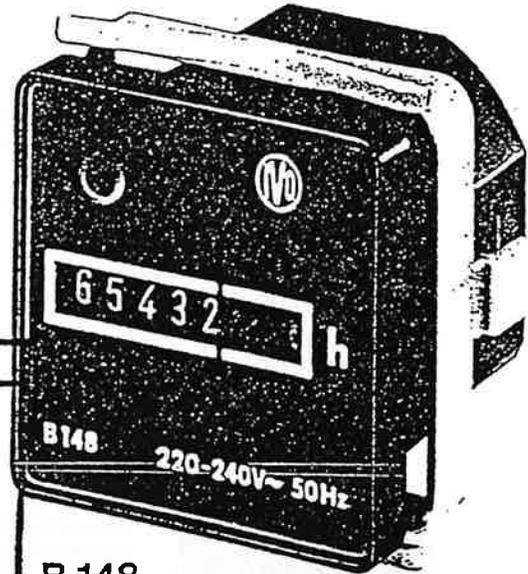
Product Information

Hour Meter for AC voltage B 148

B 148
 11.87

Description and application

The hour meter totalizes the running time for AC operated machinery or equipment, and can also be used to monitor warranty periods and service intervals. A low-noise, self-starting synchronous motor with running indicator is used to drive a geared set of figure wheels. The display runs from zero up to the full count range and starts again at zero. For easy mounting, all models are delivered with accessories. For resettable and/or predetermining hour meters see separate data sheets B 102, B 504, BE 101, BE 102, BE 504.



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PSOMAS BWA ASSOCIATES <i>[Signature]</i> DATE 8/23/89

Mounting	panel cutout	mounting accessories (included)	model
Panel mount	45x45 mm	mounting clamp	B 148.001
Panel mount	50 mm dia. round	+ bezel 55x55 mm	B 148.002
Panel mount	round or square	mounting clamp + bezel 72x72 mm	B 148.003
Base mount w/o terminal cover	—	mounting base	B 148.005
Base mount w. terminal cover	—	mounting base + cover	B 148.006
DIN-rail mounting for 35x7,5 mm rail per DIN/EN 50 027	—	mounting base + rail	B 148.007

Ordering information

1. Model number
2. Voltage
3. Frequency

Technical data

Standard voltages 110 VAC/60 Hz
Alternate voltages 24, 42, 48, 220, 240 VAC
 ± 10% 50 or 60 Hz

Power consumption 2 VA

Counting range 99 999,99 hours
 (approx. 11 years)

Reading accuracy 1/100 hr

Figures approx. 4 mm height
 hours white on black
 tenth and hundredths red on black

Electrical connection screw terminals with wire clamps AMP-plug connection, possible with 6.3 mm flat terminals

Operating temperature -10° ... + 50°C

Housing black plastic

Weight approx. 110 g

Mounting

B 148.001, B 148.002, B 148.003

With mounting clamp to mount in panels up to 10 mm thick.

B 148.005, B 148.006, B 148.007

Flat terminals from hour meter are inserted into contacts on mounting base. Hour meter is then secured to base by tightening mounting screw accessible through front panel.

Dimensional drawings



B 148.001
48x48 mm front panel with panel clamp for mounting in 48x48 mm panel cutout

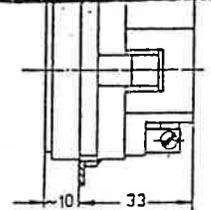
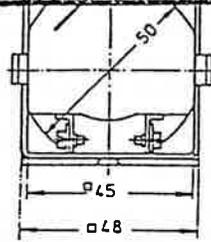
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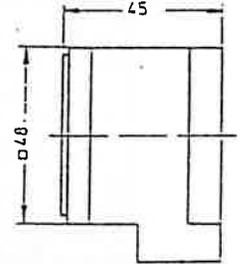
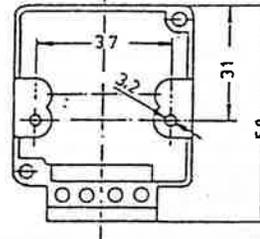
PSOHN & ASSOCIATES
 BY *[Signature]* DATE *8/23/89*



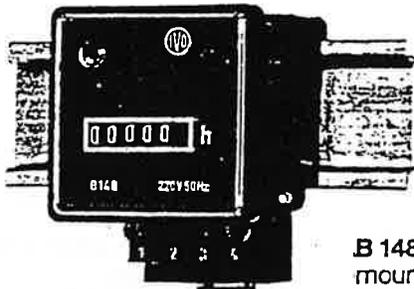
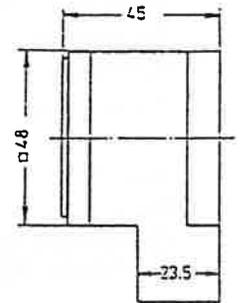
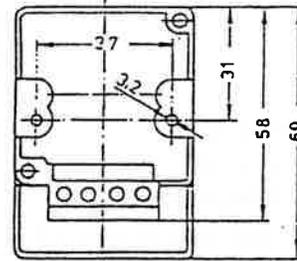
Cut-out size 45x45 mm



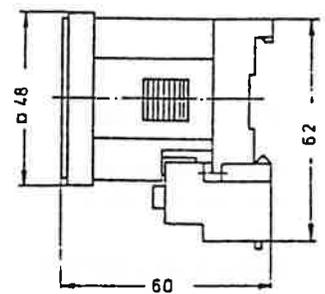
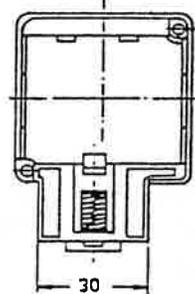
B 148.005
mounting base without panel clamp for fastening to horizontal or vertical surface



B 148.006
similar to B 148.005 with terminal cover



B 148.007
mounting base for snapping onto DIN-rail



WARNING:

When using the counter, the prevailing safety regulations must be observed. Power must be switched off before installing the counter.

Miniature Electric Counters

SHOP DRAWING REVIEW

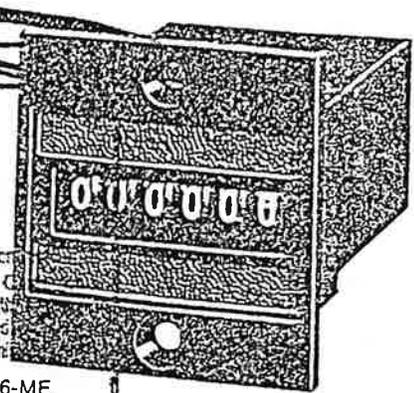
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6-Y-41346-406-ME

PSOWIS AND ASSOCIATES
 BY *[Signature]* DATE 2/23/59



Small in size and price, but large in design versatility and model variety is the Durant miniature electric counter family. Models in most popular AC or DC voltages operate on as little as 3 Watts, with the non-reset models measuring only 1" x 1.593" x 2.187" and weight just three ounces.

Available in 4, 6, or 7 figures the counters feature stainless steel self-lubricating shafts, nylatron pinions, and a synchronous electromagnetic drive to assure accurate, reliable, long life operation. Designed for mounting flexibility and aesthetic attractiveness, the miniature electric counters are available with three types of mounting and a glare retarding finish Delrin, with crisp easy to read numerals set close to a tamper-proof sealed figure window.

SPECIFICATIONS:

- Figures: 4, 6 and 7
- Speed: Up to 1000 cpm.
- Figure Size: 3/16" high
- Reset: Electric, pushbutton, and non-reset
- Reset Force: Pushbutton models only, 20 oz. maximum
- Mounting: Base, bottom, panel and plug-in pin
- Finish: Black self-extinguishing plastic

Electrical

Connections: Wire leads, 10" long, AWG 20, stripped 3/8"; and pin terminals

Power

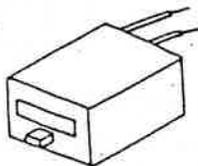
Requirements: Count coil 3 watts, reset coil 6 watts

Coils: Count coils are designed for continuous duty at rated voltage. Reset coils are designed for intermittent duty only.

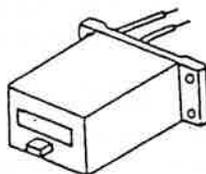
SELECTION TABLE

No. of Figures	Voltage	Mounting	Reset	Model Number
4	24V DC	Bottom	Pushbutton	4-Y-41312-402-ME-Q
4	120V AC	Bottom	Pushbutton	4-Y-41312-406-ME-Q
4	240V AC	Bottom	Pushbutton	4-Y-41312-407-ME-Q
4	24V DC	Base	Pushbutton	4-Y-41313-402-ME-Q
4	120V AC	Base	Pushbutton	4-Y-41313-406-ME-Q
4	240V AC	Base	Pushbutton	4-Y-41313-407-ME-Q
4	24V DC	Panel	Pushbutton	4-Y-41314-402-ME-Q
4	120V AC	Panel	Pushbutton	4-Y-41314-406-ME-Q
4	240V AC	Panel	Pushbutton	4-Y-41314-407-ME-Q
4	24V DC	Bottom	Electric	4-Y-41482-402-ME-ER
4	120V AC	Bottom	Electric	4-Y-41482-406-ME-ER
4	240V AC	Bottom	Electric	4-Y-41482-407-ME-ER
4	24V DC	Base	Electric	4-Y-41483-402-ME-ER
4	120V AC	Base	Electric	4-Y-41483-406-ME-ER
4	240V AC	Base	Electric	4-Y-41483-407-ME-ER
4	24V DC	Panel	Electric	4-Y-41484-402-ME-ER
4	120V AC	Panel	Electric	4-Y-41484-406-ME-ER
4	240V AC	Panel	Electric	4-Y-41484-407-ME-ER

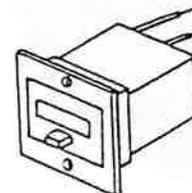
No. of Figures	Voltage	Mounting	Reset	Model Number
6	24V DC	Bottom	Pushbutton	6-Y-41321-402-ME-Q
6	120V AC	Bottom	Pushbutton	6-Y-41321-406-ME-Q
6	240V AC	Bottom	Pushbutton	6-Y-41321-407-ME-Q
6	24V DC	Base	Pushbutton	6-Y-41322-402-ME-Q
6	120V AC	Base	Pushbutton	6-Y-41322-406-ME-Q
6	240V AC	Base	Pushbutton	6-Y-41322-407-ME-Q
6	24V DC	Panel	Pushbutton	6-Y-41323-402-ME-Q
6	120V AC	Panel	Pushbutton	6-Y-41323-406-ME-Q
6	240V AC	Panel	Pushbutton	6-Y-41323-407-ME-Q
6	24V DC	Bottom	Non-Reset	6-Y-41119-402-ME
6	120V AC	Bottom	Non-Reset	6-Y-41119-406-ME
6	240V AC	Bottom	Non-Reset	6-Y-41119-407-ME
6	24V DC	Base	Non-Reset	6-Y-41345-402-ME
6	120V AC	Base	Non-Reset	6-Y-41345-406-ME
6	240V AC	Base	Non-Reset	6-Y-41345-407-ME
6	24V DC	Panel	Non-Reset	6-Y-41346-402-ME
6	120V AC	Panel	Non-Reset	6-Y-41346-406-ME
6	240V AC	Panel	Non-Reset	6-Y-41346-407-ME
7	24V DC	Bottom	Non-Reset	7-Y-41238-402-ME
7	120V AC	Bottom	Non-Reset	7-Y-41238-406-ME
7	240V AC	Bottom	Non-Reset	7-Y-41238-407-ME
7	24V DC	Base	Non-Reset	7-Y-41337-402-ME
7	120V AC	Base	Non-Reset	7-Y-41337-406-ME
7	240V AC	Base	Non-Reset	7-Y-41337-407-ME
7	24V DC	Panel	Non-Reset	7-Y-41349-402-ME
7	120V AC	Panel	Non-Reset	7-Y-41349-406-ME
7	240V AC	Panel	Non-Reset	7-Y-41349-407-ME



**BOTTOM MOUNT
WIRE LEADS**



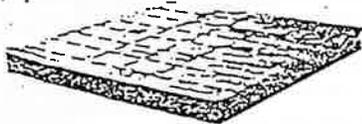
**BASE MOUNT
WIRE LEADS**



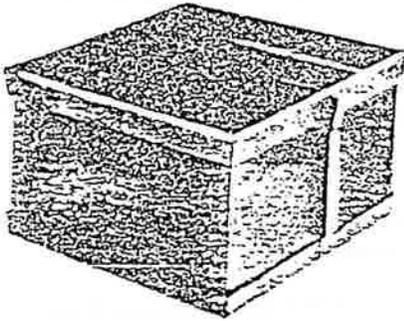
**PANEL MOUNT
WIRE LEADS**



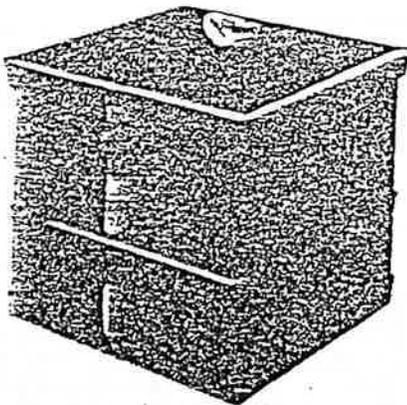
3" & 4" ABS or PVC BACKWATER VALVE AND SPECIFICATION GUIDE



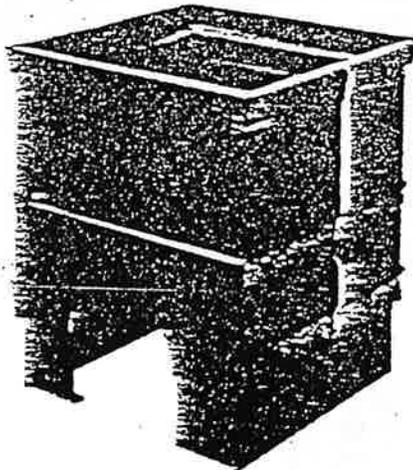
12" x 12" VALVE BOX LID
NDS-1220 — BLACK ABS



6" EXTENSION
NDS-1216



12" EXTENSION
NDS-1218

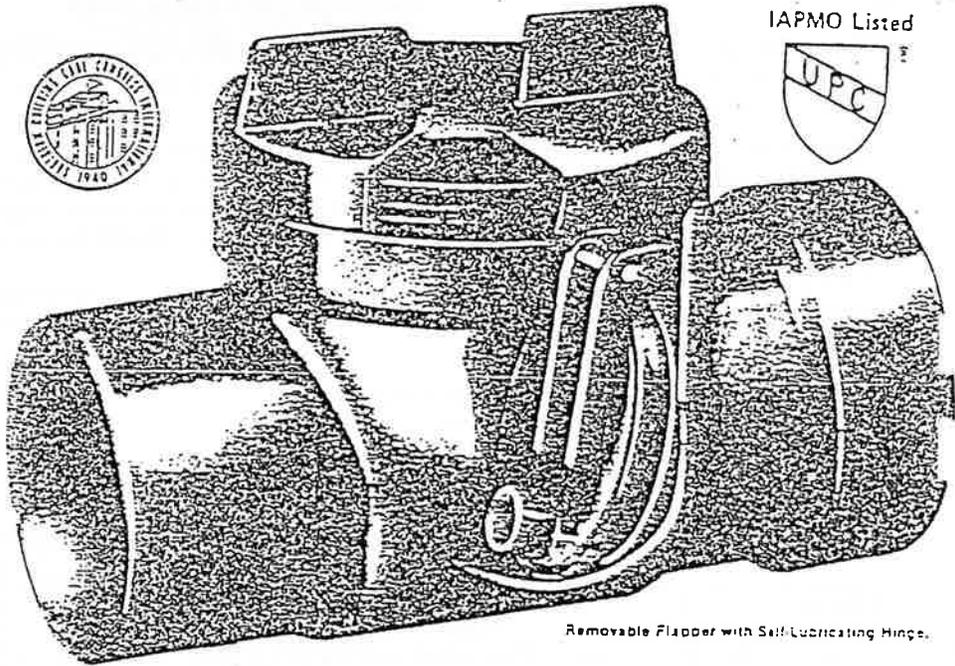
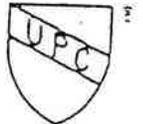


12" x 12" VALVE ACCESS BOX
NDS-1219

IMPROVED! NOW WITH SCREW TOP LID



IAPMO Listed



Removable Flapper with Self-Lubricating Hinge.

BACKWATER VALVE

A plastic backwater valve designed to protect low areas or basements from backflow of waste water from street sewers. Available in ABS or PVC plastic, with a removable flapper with self-lubricating hinge. This flapper eliminates rust, insures free movement and provides a positive seal against backflow.

For ease of inspection, the valve has a quick-open inspection cover. To aid the installer, flow direction arrows are located on top of the valve nub. The valve's spigot outlet is easily adaptable to D.W.V. couplings, D.W.V.-to-S.D. adapters, soil pipe, cast iron, PVC or no-hub systems.

CHARACTERISTICS: ABS and PVC backwater valves in 3" and 4" D.W.V. sizes for solvent cement connections. Detachable flapper is joined to hinge with a Delrin pin and securely mounted in a guide slot, and weighted with a lead slug to avoid floating. Both the key way mounted lid and flapper are lined with replaceable ribbed neoprene gaskets. These backwater valves have been pressure-tested for tightness with a 10-foot water column. This pressure test was equivalent to 4.33 PSI. The valve should not be subjected to more than ten feet (10) static water pressure.

3" PVC NDS 375P

3" ABS NDS 375

4" PVC NDS 475P

4" ABS NDS 475

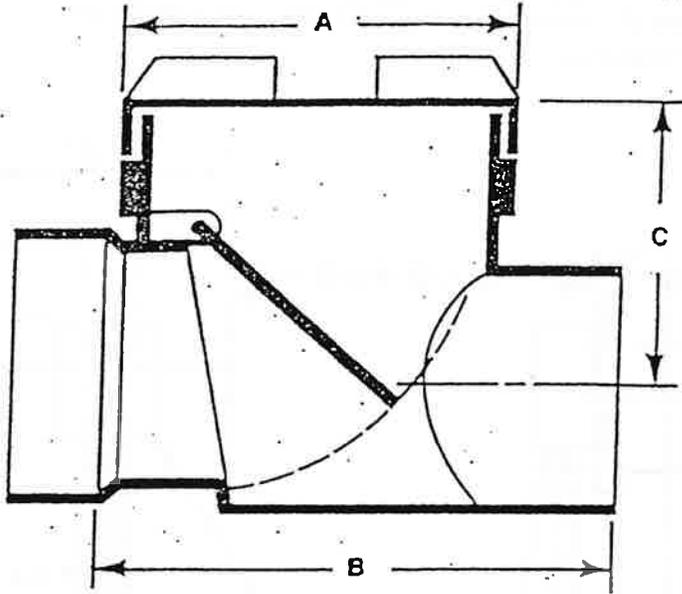
BACKWATER VALVE ACCESS BOX

Also available is the Spoe-D-Valve Access Box, molded of high impact plastic. Lightweight and durable, easier to handle and less expensive to ship. Eliminates the need for conventional mortar-and-brick access boxes. Extension risers are available in 6" and 12".

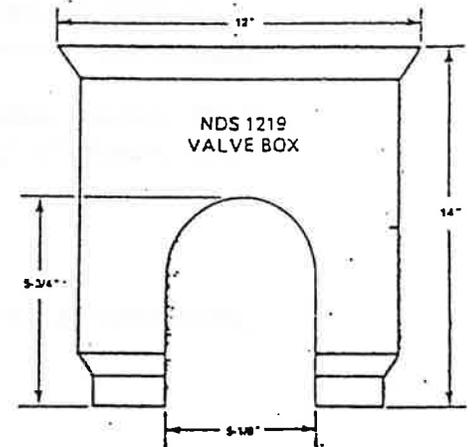
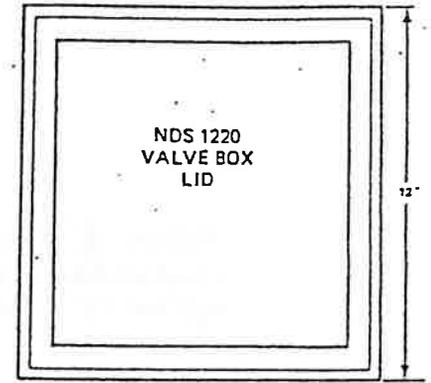
SEE OTHER SIDE FOR APPLICATIONS AND DIMENSIONS



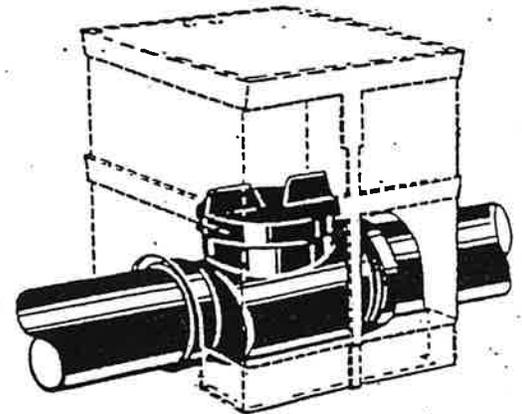
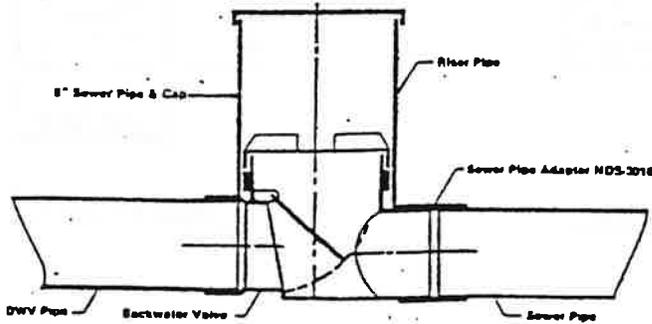
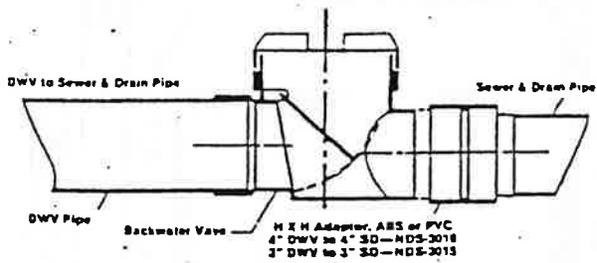
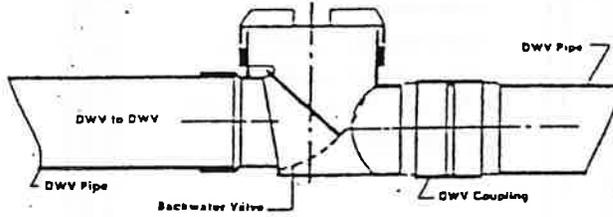
NDS 375 (3") NDS 475 (4") BACKWATER VALVE



PART NO.	SIZE	JOINT DESCRIPTION	A	B	C
NDS-375	3"	Hub x Spigot	5-3/4" Dia	4"	4-7/8"
NDS-475	4"	Hub x Spigot	6-5/8" Dia	6-7/8"	5-1/8"



Connections

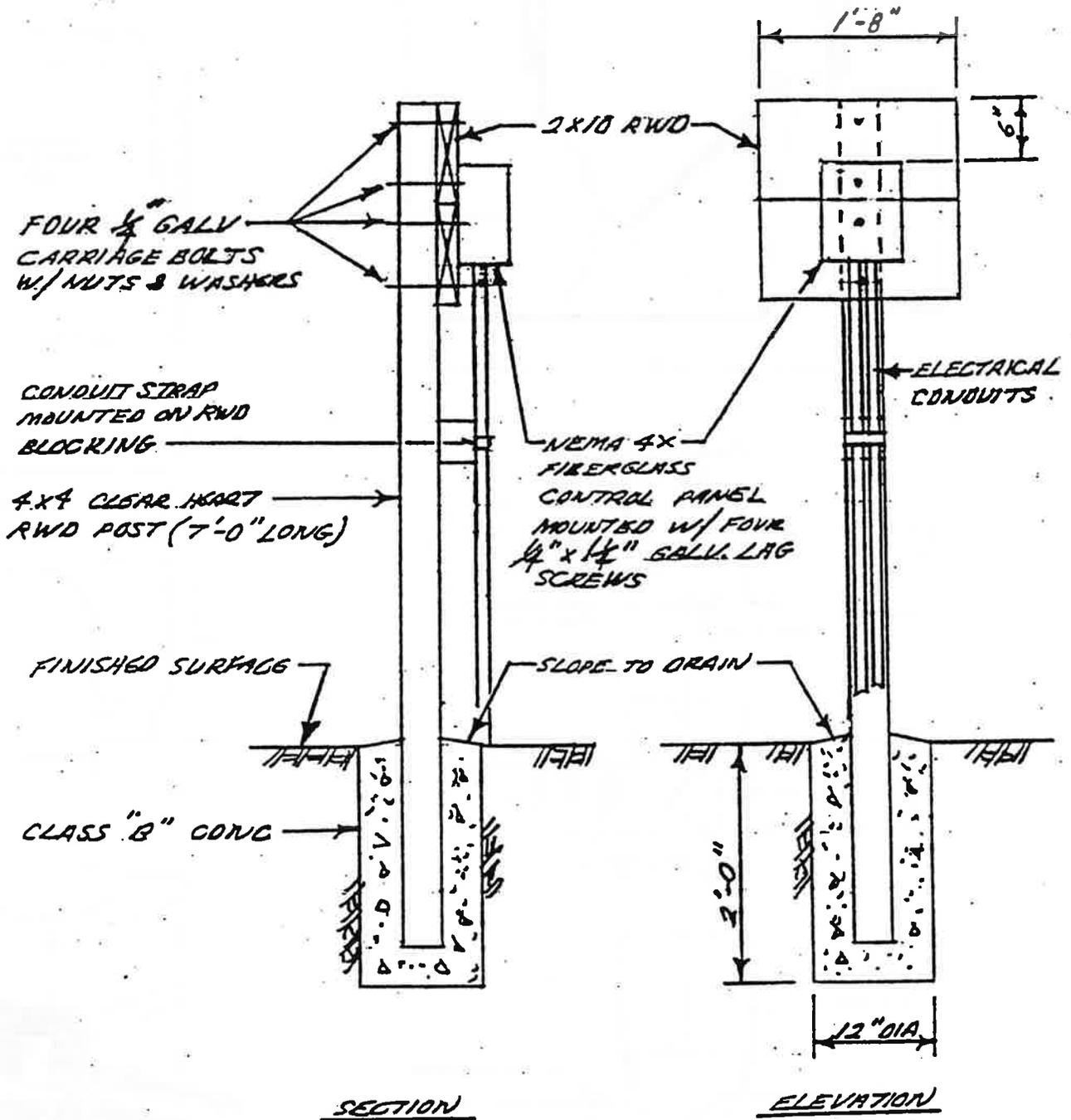


NEVADA COUNTY SANITATION DISTRICT NO. 1

PEDESTAL MOUNTED CONTROL PANEL

(05-02-90)

NOTE: PEDESTAL SHALL BE LOCATED ON THE SOUTH SIDE OF THE SEPTIC TANK WITH THE PANEL FACING TO THE NORTH TO PROTECT IT FROM THE SUN.



PREPARED BY: *Hendon*

