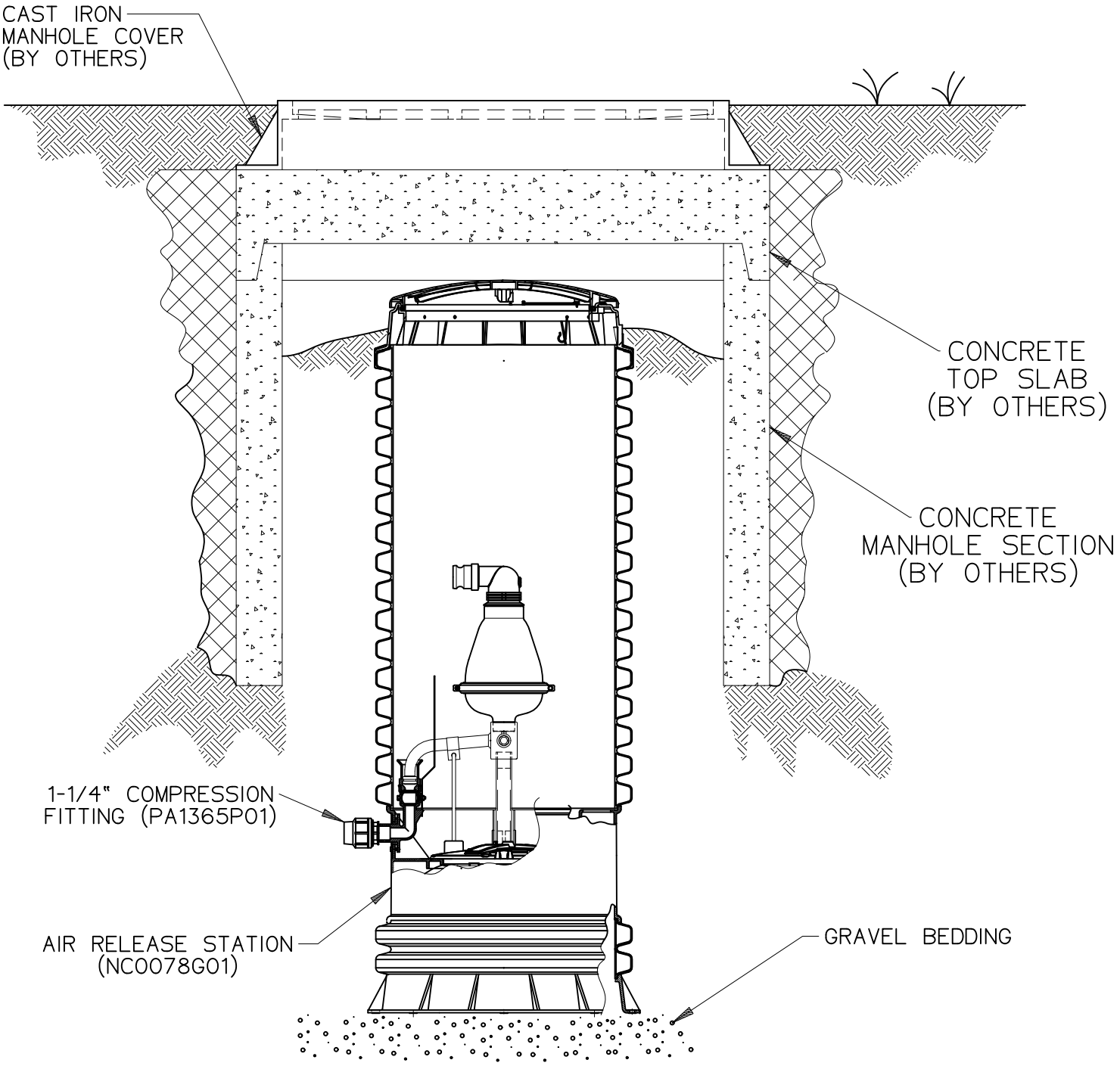


NOTE:

TRAFFIC BEARING APPLICATION TO BE SPECIFIED AND APPROVED BY LOCAL ENGINEER

THERE IS TO BE NO LOAD FROM THE TRAFFIC OR THE MANHOLE TRANSLATED TO THE STATION

SKETCH IS FOR REF. ONLY

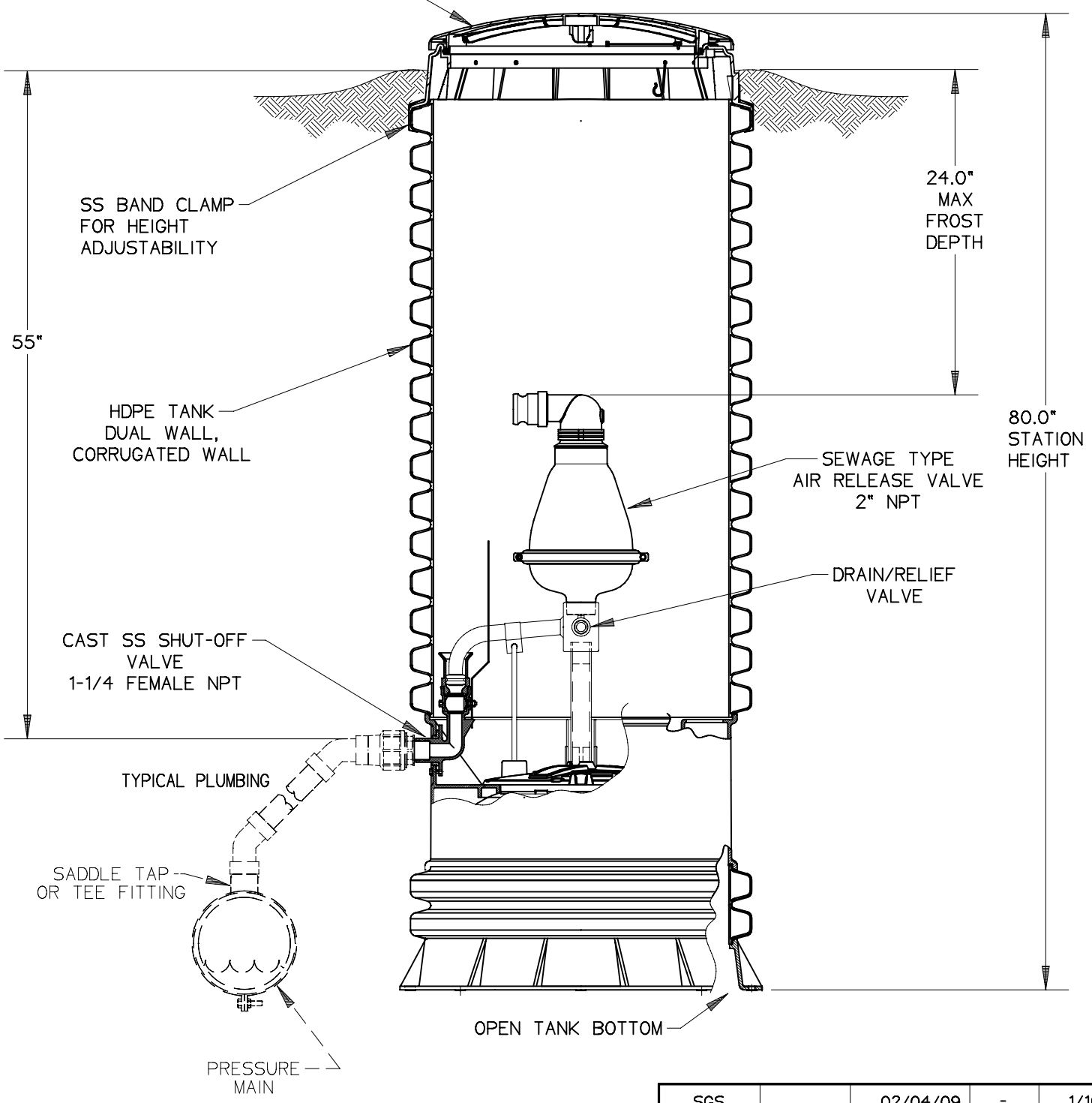
SGS		08/30/17	1	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

AIR RELEASE STATION IN A MANHOLE

ESD 17-0083

AIR RELEASE STATION
2 FT FROST DEPTH



SGS		02/04/09	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

CUT SHEET, AIR RELEASE STATION
FOR 2' FROST DEPTH

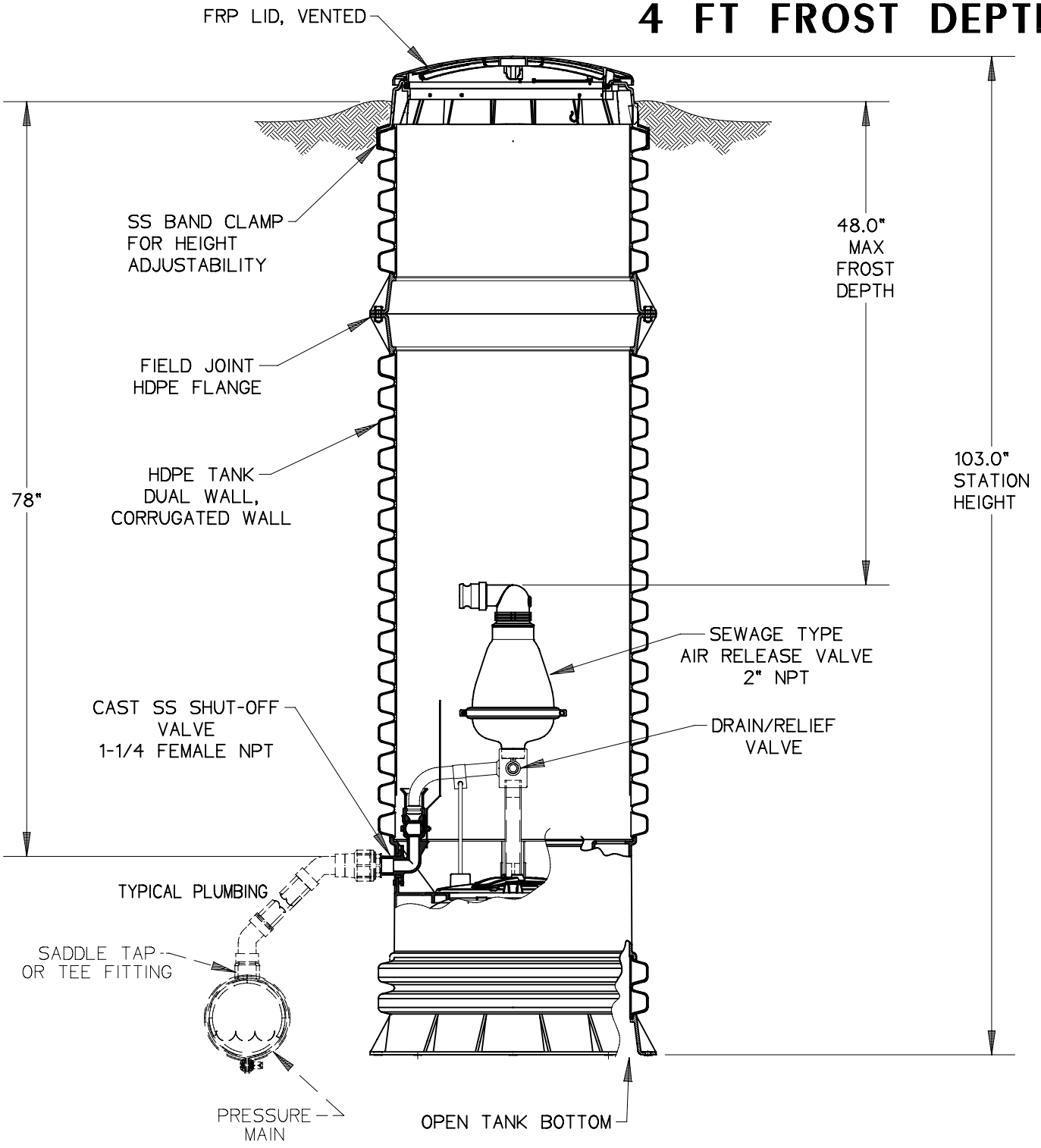
NA0183P01

NOTES:

1. ALL ITEMS SHOWN IN DASHED LINES ARE FOR REFERENCE ONLY, AND ARE SUPPLIED BY OTHERS

ORDER NUMBER: NC0078G01

AIR RELEASE STATION
4 FT FROST DEPTH



NOTES:

1. ALL ITEMS SHOWN IN DASHED LINES ARE FOR REFERENCE ONLY, AND ARE SUPPLIED BY OTHERS

SGS		02/04/09	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

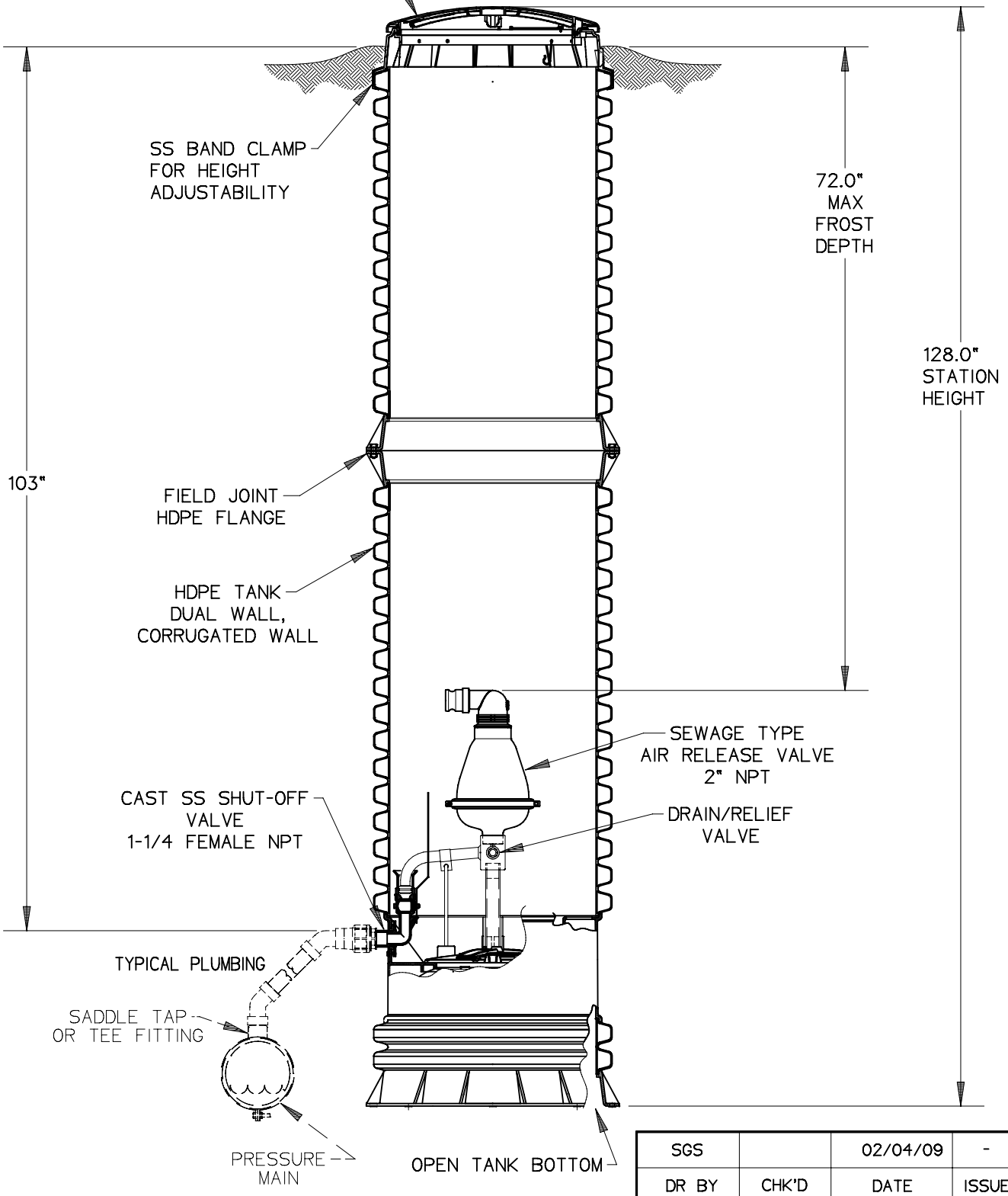
SEWER SYSTEMS

CUT SHEET, AIR RELEASE STATION FOR 4' FROST DEPTH

ORDER NUMBER: NC0078G02

NA0183P02

AIR RELEASE STATION
6 FT FROST DEPTH



SGS		02/04/09	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

NOTES:

1. ALL ITEMS SHOWN IN DASHED LINES ARE FOR REFERENCE ONLY, AND ARE SUPPLIED BY OTHERS

SEWER SYSTEMS

CUT SHEET, AIR RELEASE STATION FOR 6' FROST DEPTH

ORDER NUMBER: NC0078G03

NA0183P03

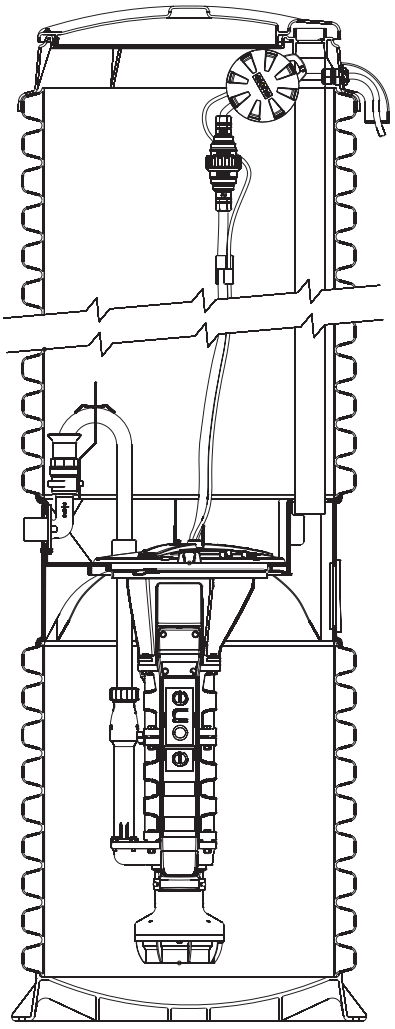
E/One Installation Checklist

Project:	**Installer:**
Address/Location:	**Inspector:**
Serial Number:	**Date:**

Date	Yes	
		1. *Burial*
	☐	The pallet is removed from the station
	☐	There is a minimum of 6" of naturally rounded stone bedding the hole
	☐	The station is level
	☐	The top of the station lid is at least 5" above *final grade*
		The station is properly ballasted by:
		☐ Precast ballast (BEST)
		☐ Pour-in-place (GOOD)
		☐ Other: _____
		2. *Inlet*
	☐	The inlet pipe is correct for the grommet that is being used (SCH 40=Black), (SDR 35=Grey)
	☐	The inlet pipe is entering the station perpendicular and pitched correctly toward the station
	☐	There is no more than 3" of pipe inside of the station
	☐	The grommet is secure and water tight
	☐	The inlet is stubbed out, is it at least 5' long and sealed with a water tight, glued PVC cap
	☐	The inlet line is bedded with 4-6" of stone
		3. *Discharge*
	☐	The discharge line is secured and water tight
	☐	A Check Valve and Curb Stop is installed between the station and the main
		☐ E/One Valve Kit
		☐ Other _____
	☐	The check valve is installed directionally correct
	☐	The discharge line is bedded with 4-6" of stone
		4. *Vent*
	☐	The vent is entering the station perpendicular
	☐	The grommet is secure and water tight
		5. *Backfill*
	☐	The backfill material is free of clay, rocks, roots, etc.
	☐	The backfill material is compacted in 1' lifts
		6. *Station*
	☐	The EQD & Equalizer hung at the top of the station
	☐	The inside of the station free of dirt, rocks and any other foreign debris
	☐	The lid flange, seal area clean and free of dirt, rocks and other foreign debris
	☐	All of the lid bolts installed and tightened securing the lid to the station
		7. *Electrical*
	☐	If direct buried, conduit is 2' into the ground at the panel & station with 6" to 12" settling loop
	☐	The panel is only penetrated in the bottom
	☐	The panel is supplied by a dedicated 30 Amp breaker feeding 216-264VAC
	☐	There are four wires from the source (L1, L2, Neutral & Ground)
	☐	The conduit in the panel sealed with Duct Seal
	☐	There only enough cable left in the station to service the EQD 2-3' out of the station
	☐	The liquid tight cord grip tightened
	☐	The panel mounted in a conspicuous location with line of sight from the station
	☐	The panel mounted 4' to 5' off the ground

E/ONE EXTREME SERIES

DH071/DR071



Patent Numbers: 5,752,315
5,562,254 5,439,180

* Discharge data includes loss through check valve, which is minimal.

NA0050P01

General Features

The model DH071 or DR071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank and controls. The DH071 or DR071 is packaged into a single complete unit, ready for installation.

The DH071 is the "hardwired," or "wired," model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR071 is the "radio frequency identification" (RFID), or "wireless," model that uses wireless technology to communicate between the level controls and the motor controls.

All solids are ground into fine particles, allowing them to pass easily through the pump, check valve and small diameter pipelines. Even objects not normally found in sewage, such as plastic, rubber, fiber, wood, etc., are ground into fine particles.

The 1.25-inch discharge connection is adaptable to any piping materials, thereby allowing us to meet your local code requirements.

The tank is made of tough corrosion-resistant HDPE. The optimum tank capacity of 70 gallons is based on computer studies of water usage patterns. A single DH071 or DR071 is ideal for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory. This model can accommodate flows of 700 GPD.

The internal check valve assembly, located in the grinder pump, is custom-designed for non-clog, trouble-free operation.

The grinder pump is automatically activated and runs infrequently for very short periods. The annual energy consumption is typically that of a 40-watt light bulb.

Units are available for indoor and outdoor installations. Outdoor units are designed to accommodate a wide range of burial depths.

Operational Information

Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections

Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

*Discharge**

15 gpm at 0 psig

11 gpm at 40 psig

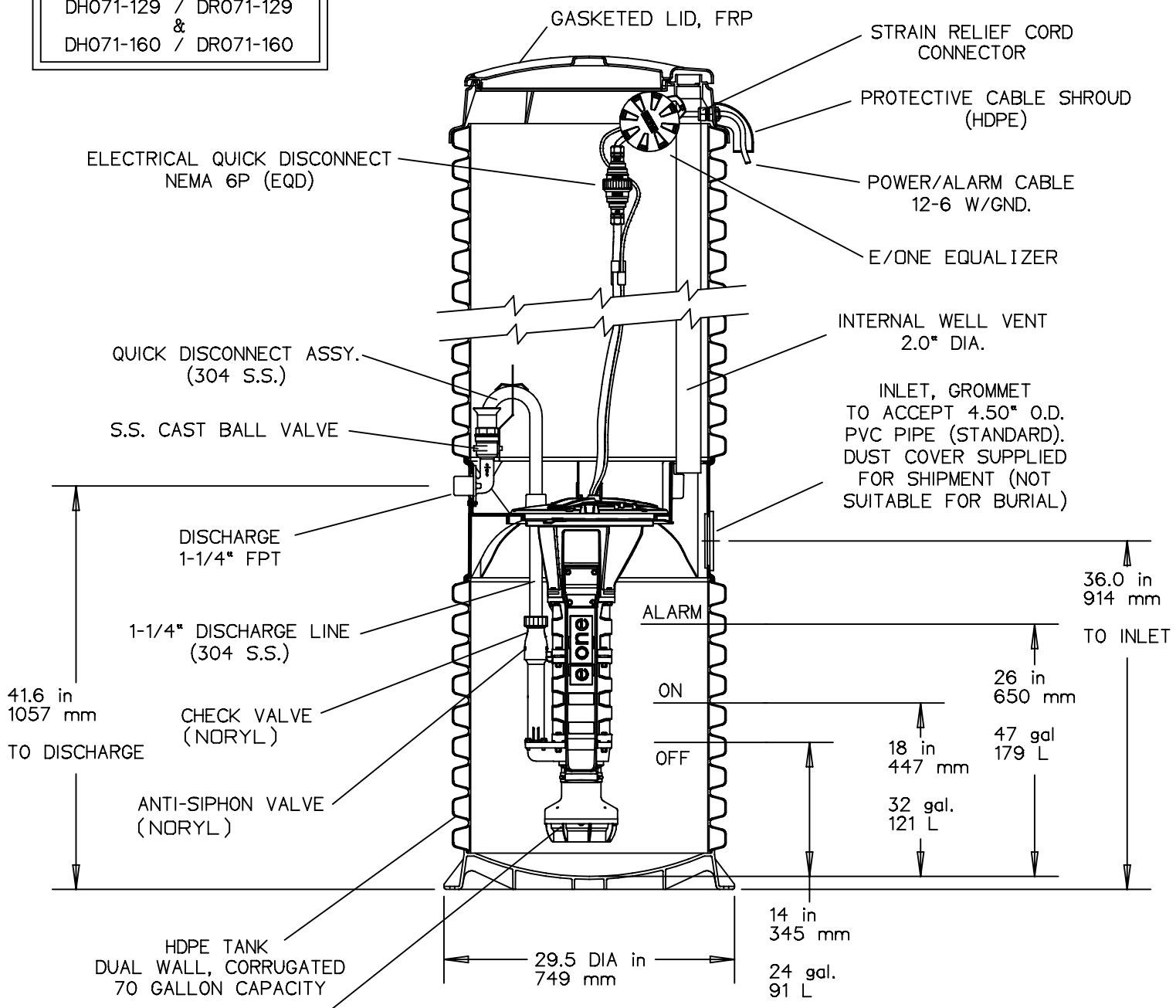
7.8 gpm at 80 psig

Overload Capacity

The maximum pressure that the pump can generate is limited by the motor characteristics. The motor generates a pressure well below the rating of the piping and appurtenances. The automatic reset feature does not require manual operation following overload.

OPTIONS : ☐ DH071 (HARD WIRED LEVEL CONTROLS)
☐ DR071 (WIRELESS LEVEL CONTROLS)

FIELD JOINT REQUIRED
FOR MODELS
DH071-129 / DR071-129
&
DH071-160 / DR071-160



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

AD	CH	07/12/07	A	
DR BY	CHK'D	DATE	ISSUE	SCALE

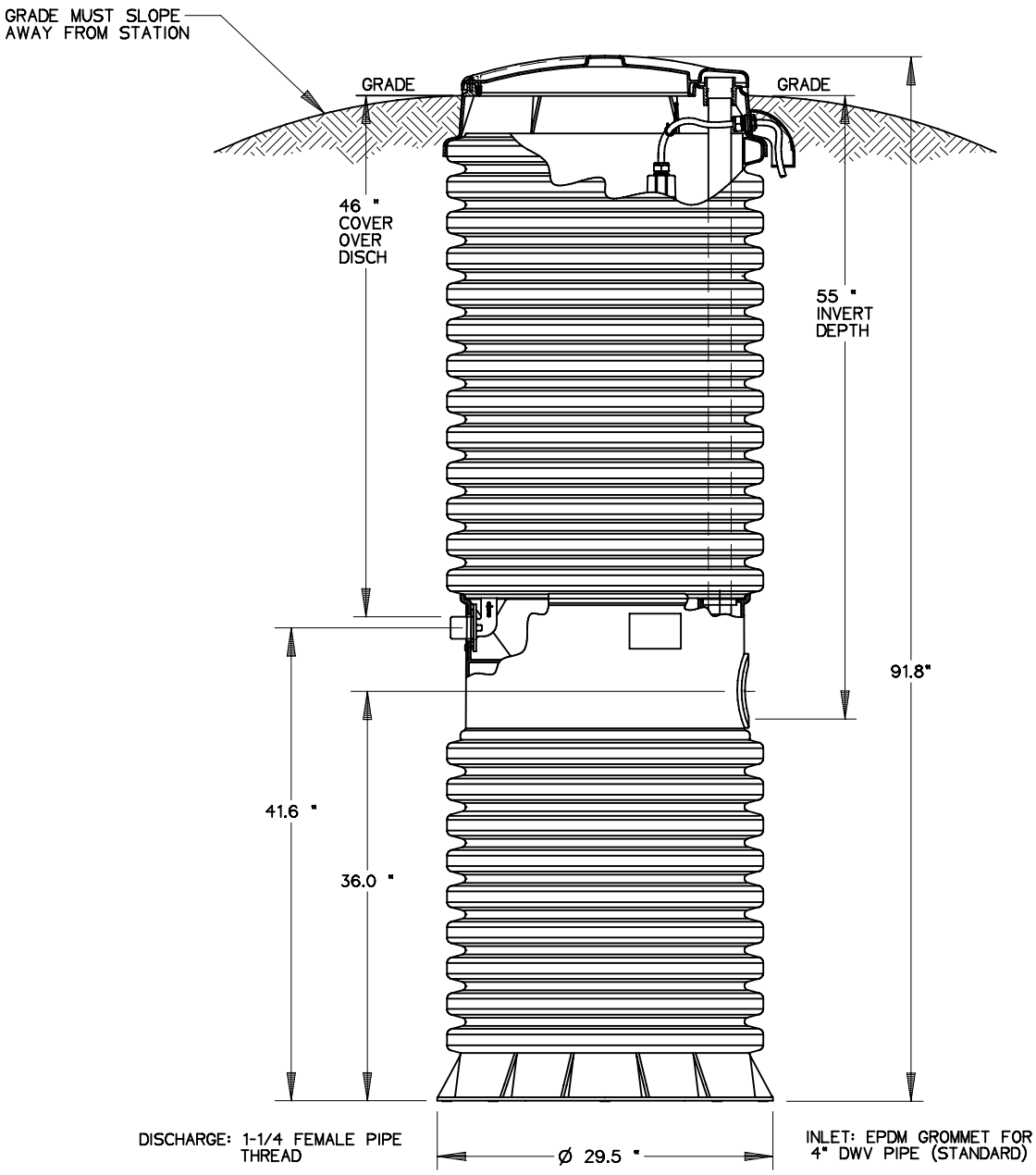
SEWER SYSTEMS

MODEL DH071 / DR071
DETAIL SHEET

NA0050P02

OPTIONS : ☐ DH071-93 (HARD WIRED LEVEL CONTROLS)

☐ DR071-93 (WIRELESS LEVEL CONTROLS)



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

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DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

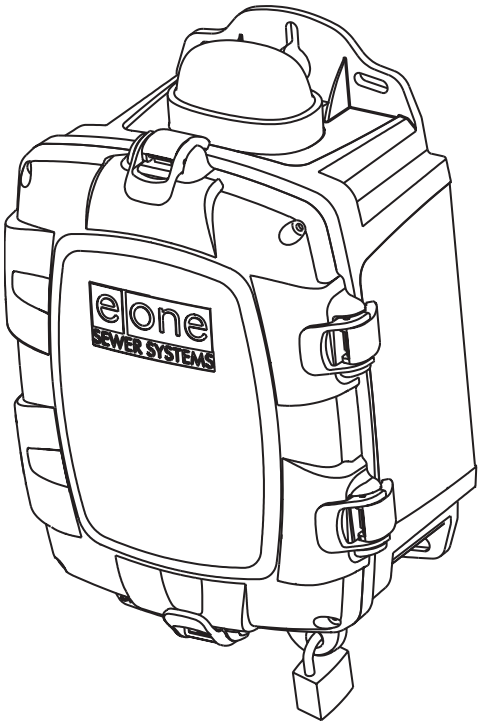
MODEL DH071-93 / DR071-93

NA0050P06

E/ONE EXTREME SERIES

E/One Sentry™

Alarm Panel — Protect Plus Package



Description

The E/One Sentry panels are custom designed for use with Environment One grinder pump stations. They can be configured to meet the needs of your application, from basic alarm indication to advanced warning of pending service requirements.

E/One Sentry panels are supplied with audible and visual high level alarms. They are easily installed in accordance with relevant national and local codes. Standard panels are approved by UL, CSA, CE and NSF to ensure high quality and safety.

The panel features a corrosion-proof, NEMA 4X-rated, thermoplastic enclosure. A padlock is provided to prevent unauthorized entry (safety front).

Standard Features

Includes all features of the basic configuration of the E/One Sentry panel, including circuit breakers, 240 or 120 VAC service, terminal blocks and ground lugs, audible alarm with manual silence, manual run feature and run indicator, redundant “Start” function with high level alarm, safety front, conformal-coated board and overload protection.

Includes all of the features of the E/One Sentry Protect package, including a Trouble indication that shuts down the pump temporarily in the event of an unacceptable operating condition (brownout, system overpressure, run dry), as well as:

Predictive status display module

Pre-alarm indication for major operating parameters

Alarm indications for major operating parameters

Hour meter, cycle counter and alarm delay

LCD display and user-friendly interface

Inner cover (dead front)

Contact group — dry and Remote Sentry

Optional Features

Generator receptacle with auto transfer

GFCI

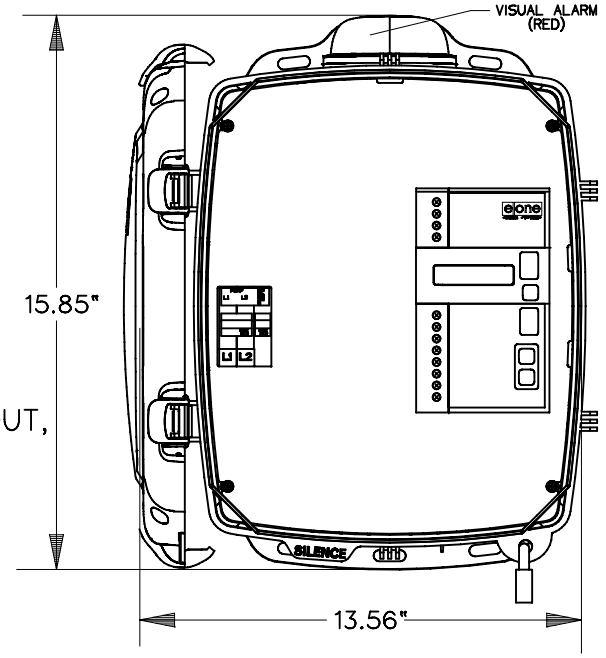
Main service disconnect

Please consult factory for special applications.

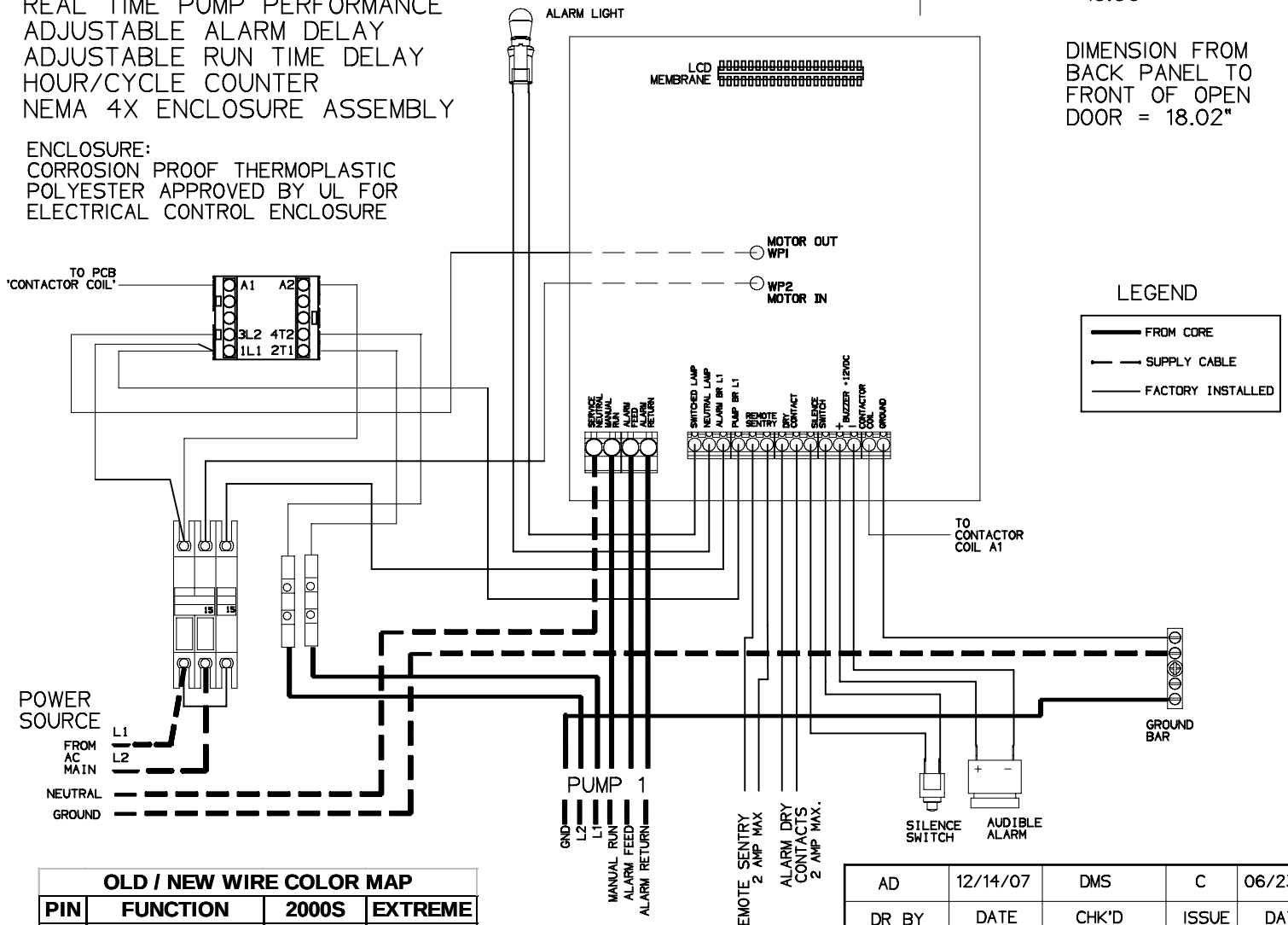
SENTRY PROTECT PLUS
SIMPLEX

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
REMOTE SENTRY DRY CONTACTS FOR
OPTIONAL POWER LOSS HIGH LEVEL
ALARM (POWER LOSS ALARM FOR WIRELESS)
MANUAL ALARM SILENCE
MANUAL RUN
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL
TROUBLE INDICATIONS: RUN DRY, OVERPRESSURE, BROWNOUT,
VOLTAGE, EXTENDED RUN TIME
DRY CONTACTS
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)
PADLOCK
DEAD FRONT
PREDICTIVE ALARMS
REAL TIME PUMP PERFORMANCE
ADJUSTABLE ALARM DELAY
ADJUSTABLE RUN TIME DELAY
HOUR/CYCLE COUNTER
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE:
CORROSION PROOF THERMOPLASTIC
POLYESTER APPROVED BY UL FOR
ELECTRICAL CONTROL ENCLOSURE



DIMENSION FROM
BACK PANEL TO
FRONT OF OPEN
DOOR = 18.02"



OLD / NEW WIRE COLOR MAP			
PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL,
SIX CONDUCTOR

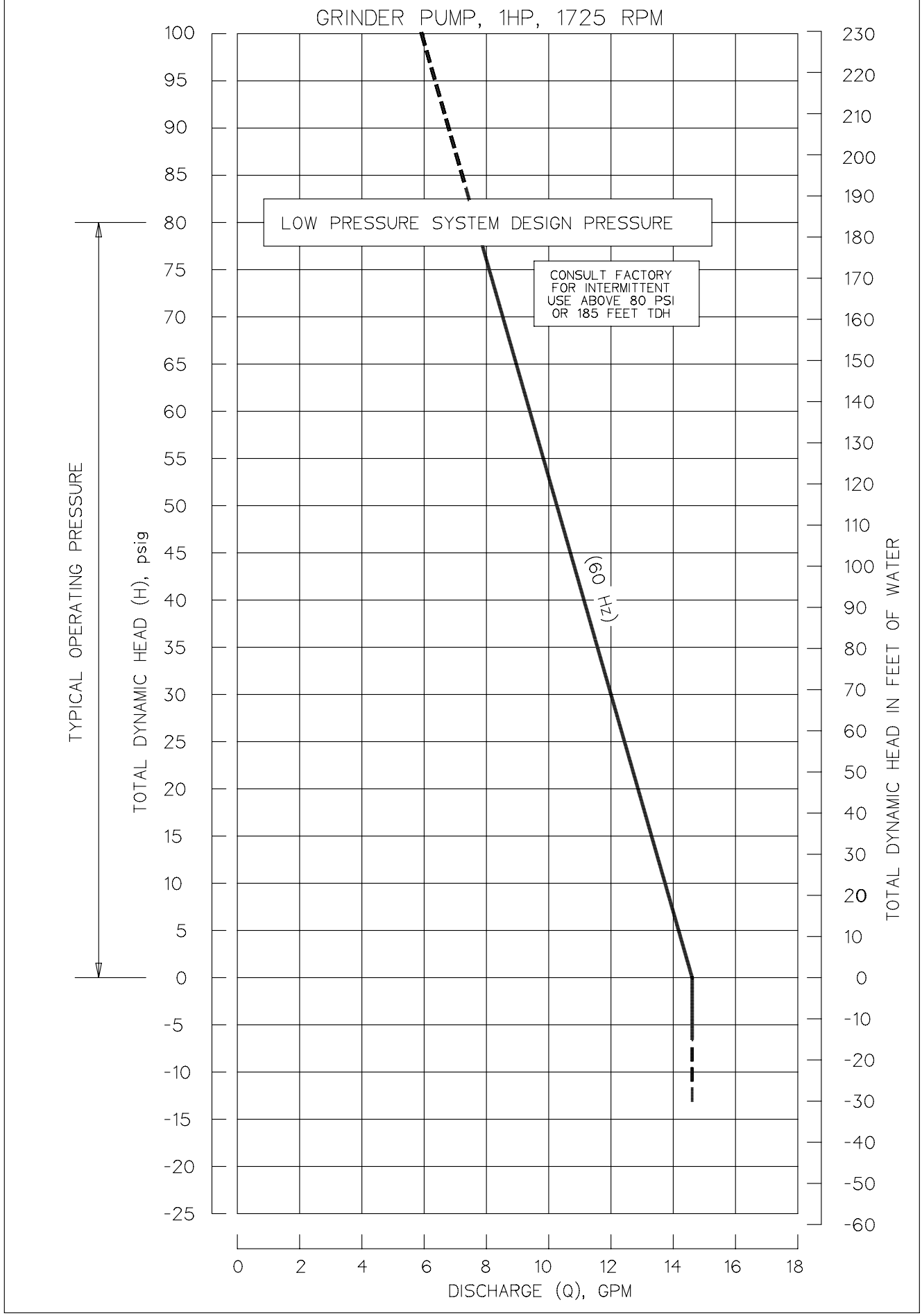
AD	12/14/07	DMS	C	06/23/11
DR BY	DATE	CHK'D	ISSUE	DATE

SEWER SYSTEMS

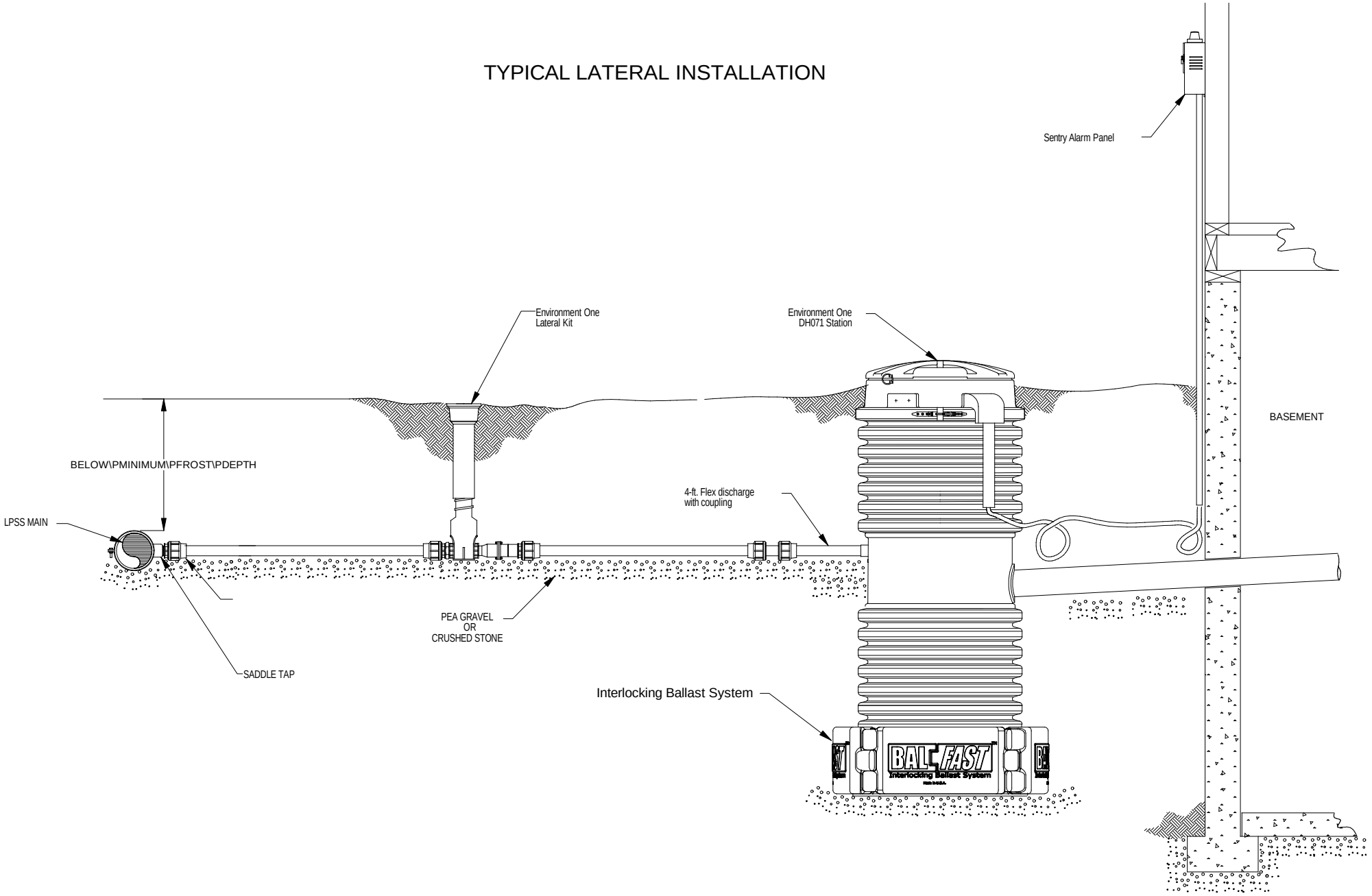
SENTRY PROTECT PLUS PANEL, SIMPLEX
240V 60Hz DOUBLE POLE POWER

NA0079P03

E|ONE SPD PUMP PERFORMANCE CURVE



TYPICAL LATERAL INSTALLATION



frma L114C

BAL-FAST™

Interlocking Ballast System

www.bal-fastsystems.com

Patent Pending

INTRODUCING

We are very pleased to introduce the original **Bal-Fast™** interlocking ballast block system. **Bal-Fast™** provides the manufacturer's required ballast without all of the time, effort and expense of field constructed forms. With **Bal-Fast™** systems your clients can install your grinder pump product much more quickly and easily, usually in less than one day.

Bal-Fast™ interlocking blocks may be installed:

- At the factory or warehouse prior to shipment
- At the job site staging area
- At the job site prior to placement
- At the job site in the excavated trench
- Blocks are maneuverable as separate pieces weighing 96# +/-
- Blocks can be set and moved if the location changes
- Work can be done on top of the trench to set and remove blocks

The Interlocking Bal-Fast™ block system comes with locking pins and removable lifting rings. Four point lifting harness (optional) makes setting complete station and ballast simple and *Fast.*

The Bal-Fast™ Interlocking Ballast System is the result of extensive research and experience working with installers who handle Environment One® pump installations daily. Installers and their Environment One® Dealers have long sought a convenient and affordable solution to the time consuming and wasteful methods used in the past.

The **Bal-Fast™** system eliminates the forming and pouring or pre-casting of concrete. Let's face it the concrete truck rarely comes on time. Why waste billable time waiting for the concrete to arrive? Further more, why waste valuable time waiting for concrete to cure before you backfill?

Bal-Fast™ systems vastly improve the maneuverability of the pump and ballast greatly reducing the potential for damage. Tough locations are not a problem with **Bal-Fast™.**

Dealers can now offer complete solutions to their customers to include everything they need to successfully complete an Environment One ® pump installation. Take your pump and **Bal-Fast™** system delivery the same day.

The Bal-Fast™ Interlocking Ballast System is highly specifiable and is manufactured to provide the required ballast needs with a smooth, uniform contoured block designed specifically to work with the Environment One® tanks. The custom designed block securely engages the outer pipe ribs to provide uniform support with no sharp points of contact. The smooth outer shell makes backfilling easier and more uniform. The high strength HDPE form provides the installer with the same size block to work with every time. Blocks simply interlock together and are secured with a galvanized locking pin. The high strength concrete material provides for a durable product made for rough handling.

The top surface provides the required surface area to capture compacted backfill material to provide the additional ballast needs. **Bal-Fast™** is designed to provide the full ballast needs with proper backfill in fully saturated soil conditions.

Bal-Fast™ provides (4) four point lifting hardware to allow for even lifting support for installers to maneuver and install their grinder pump.

Use Bal-Fast™ Ballast Solutions for your next grinder pump project and you will see the added value and savings.

The **Bal-Fast™** interlocking ballast block system is specially designed with the installer in mind. The blocks are made to be easy to maneuver and to install. The special interlocking design makes for a continuous ballast ring to secure your pump station.
Safety and efficiency will be greatly improved with the **Bal-Fast™** ballast block system.

You no longer need to spend time forming and preparing a ballast ring or mixing and pouring concrete. No more waiting for concrete set time to backfill.

With **Bal-Fast™** there is no more handling of bulky pre-cast rings. Schedule delivery of your pump and ballast block at the same time and there is no need for advanced preparation.
This makes scheduling easier and greatly improves cash flow!
Block weight 96# for Net ballast of 384# in air.

For a better installation in half the time - There is no better answer than **Bal-Fast™**.

Need additional ballast or structural support in difficult soils?
Add an additional course of **Bal-Fast™** interlocking riser blocks. Made of the same rugged mold and concrete ballast material, the **Bal-Fast** riser block adds 220 # of ballast per ring. Additional courses may be added up to a total of 3 rows.

Bal-Fast™ ***even has a solution for cold climate installations!***
With the **Bal-Fast™** interlocking insulation block system, you can install courses of insulator blocks to protect your pump from frost damage. The insulator block is to be used with other internal frost protection from the OEM.

The Full HDPE shell completely encases the pump and provides a fully enclosed foam filled ring around the entire pump. Insulator blocks are stackable and may be installed along the entire ribbed surface from the top transition all the way to the pipe inlet.

The **Bal-Fast™ Interlocking Ballast System** was invented to solve common ballast issues of grinder pump installations. Based on over 25 years of experience installing and servicing Environment One® pump systems we have heard the customer's comments. The marketplace has long awaited such a product to make these installations easier, more cost effective and ***Bal-Fast™***. We are ready to provide full support with product specifications and demonstrations. **The Bal-Fast™** system was designed for convenience. A well stocked distributor, ready to supply installers with the **Bal-Fast™** solution is your best answer.

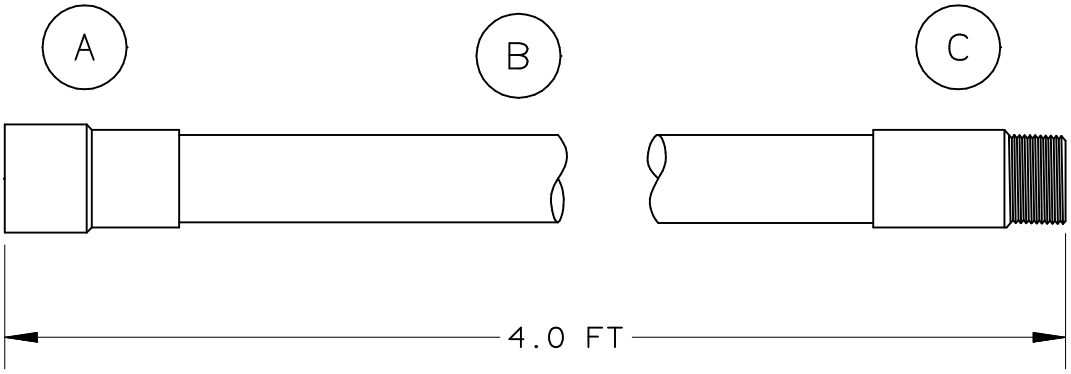
Please feel free to contact us with questions or needs. We look forward to working with you to help increase your business offering and to provide tools to help you sell more Environment One® products as well.

Best regards,

Gail M. Albro,
President /CFO
Gail M. Albro
978-808-4981

Henry S. Albro,
North American Sales Manager- Inventor
Henry S. Albro.
978-808-4986

REV SYM	REVISION DESCRIPTION	DATE	APPD
-	INITIAL RELEASE PER ECN 03-0335	3-14-03	SGS

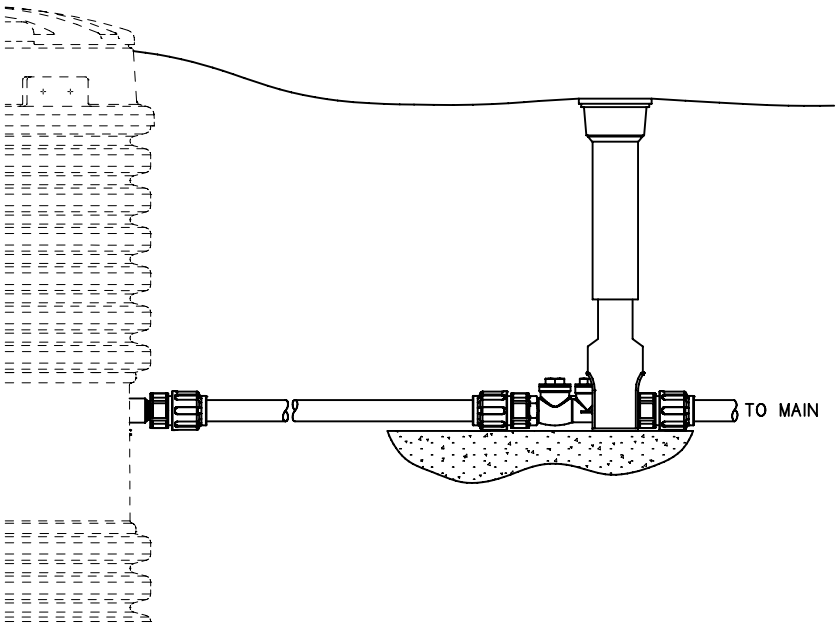


	FITTING "A"	PIPE "B"	FITTING "C"
P01	1-1/4 FEMALE NPT 304 SS	HDPE PEP SDR11	1-1/4 MALE NPT 304 SS
P02	1-1/4 MALE NPT 304 SS	HDPE PEP SDR11	1-1/4 MALE NPT 304 SS
P03	1-1/2 FEMALE NPT 304 SS	HDPE PEP SDR11	1-1/4 MALE NPT 304 SS
P04	1-1/2 MALE NPT 304 SS	HDPE PEP SDR11	1-1/4 MALE NPT 304 SS
P05	1-1/4 WELD TRANSITION (PUP)	HDPE SDR9	1-1/4 MALE NPT 304 SS

MANUFACTURER: POLY-CAM, INC.

UNLESS OTHERWISE SPECIFIED THE FOLLOWING APPLIES	DR BY: S.SALVI	environment one CORPORATION
SHOP PRACTICE PER E-5000-01	CHK'D	
GEOMETRIC TOLERANCES PER ASA STD Y14.5	ENG	
√ MACHINE FINISH	PROJ ENG	
TOLERANCE ON DIMENSIONS	SCALE	DISCHARGE FITTING, SS X HDPE
2 PLACES: ± 0.02 / 3 PLACES: ± 0.005 / ANGLES: ± 30'	WT	FIRST MADE FOR -
	APPD	PA1836PXX -
	ISSUED	DRAWING NUMBER SH 1 OF 1 REV
	CODE IDENT	

Forced Sewer Main Service Lateral Kits
SDR 11 HDPE Pipe featuring
SS Valves and Engineered Thermoplastic Fittings



Description

These kits feature all components commonly needed to connect an Environment One grinder pump station to the corporation stop/saddle tap on a sewer main. The kit is designed to be used with SDR 11 HDPE pipe, high density polyethylene pipe (provided by others) and includes compression fittings for fast, easy field installation. The curb stop assembly integrates a robust stainless steel ball valve curb stop and a stainless steel flapper type check valve. Adjustable height, curb boxes are supplied in Arch pattern.

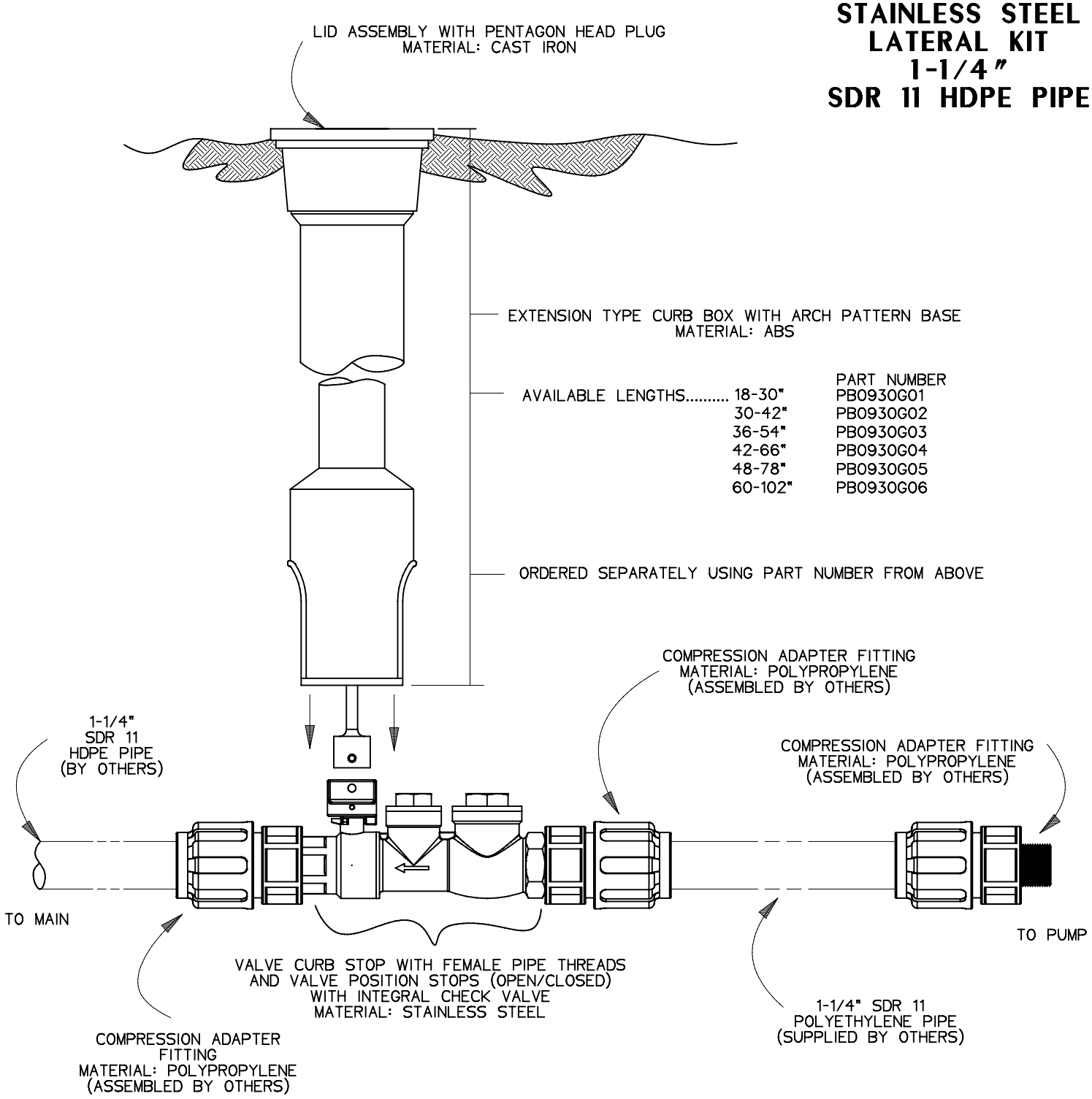
Standard Features

- Compression couplings for 1-1/4” SDR 11 HDPE pipe
- All fittings rated for 150 psi service pressure, minimum
- Provided unassembled, for field assembly
- Integrated stainless steel ball valve curb stop and stainless steel check valve assembly
- Arch pattern curb boxes in heights from 1-1/2 feet to 8-1/2 feet
- Curb boxes are ABS with a cast iron cover
- Curb Stop/Check Valve component rated for 235 psi

Optional Features

- Compression couplings for 1-1/2” SDR 11 HDPE pipe
- PVC solvent weld fittings for 1-1/4” Schedule 40 pipe
- Curb boxes available in several sizes

STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE



KIT PARTS ARE NOT ASSEMBLED

NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

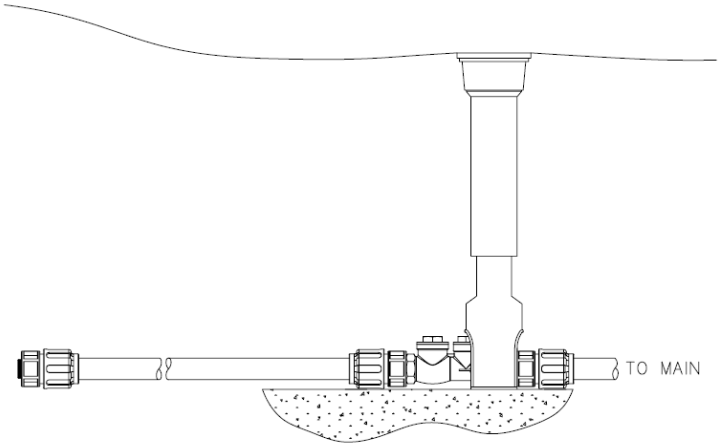
SGS	DN	11/02/11	A	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

STAINLESS STEEL LATERAL KIT
1-1/4" SDR 11 HDPE PIPE

NA0330P02

E/ONE EXTREME SERIES



Stainless Steel & Engineered Thermoplastics

Typical Specifications

Stainless Steel Forced Sewer Main Service Lateral Kits SDR HDPE Pipe

(Compression Fitting)

SPECIFICATION:
SERVICE LATERAL KIT WITH STAINLESS STEEL VALVES AND ENGINEERED THERMOPLASTIC COMPRESSION FITTINGS

General

Description: The **MANUFACTURER** shall furnish service lateral kits (exclusive of piping); each consisting of three (3) compression fittings, one (1) combination curb stop/check valve assembly and one (1) curb box. The curb stop/check valve assembly shall be 304 stainless steel and have a two-piece cast 304 stainless steel housing. All plastic compression fittings are to be molded from polypropylene and shall be tested for resistance to aging, pressure rating, tensile strength, and flexural strength. All components shall incorporate compression fitting connections for easy, reliable installation of piping. The lateral kit shall be rated for 150 psi service. Lateral kits with pressure-tested combination curb stop/ check valve assembly shall be provided by Environment One Corporation, Niskayuna, New York, or approved equal.

Shop Drawings: After receipt of notice to proceed, the **MANUFACTURER** shall furnish a minimum of six (6) sets of shop drawings detailing the equipment to be furnished, including dimensional data and materials of construction. The **SPECIFYING ENGINEER** shall promptly review this data and return two (2) copies as accepted, or with requested modifications. Upon receipt of accepted shop drawings, the **MANUFACTURER** shall proceed immediately with fabrication of the equipment.

Warranty: All merchandise is warranted to be free from defects in materials and factory workmanship. Environment One shall provide, free of charge, new products in equal quantities for any that prove defective within two (2) years from date of shipment from our factory. **MANUFACTURER** shall not be liable for any loss, damage, or injury, direct or consequential, arising out of the use of or the inability to use the product. Before using, the user shall determine the suitability of the product for his intended use and user assumes all risk and liability whatever in connection therewith. No claims for labor or consequential damage will be allowed. The foregoing may not be changed except by agreement signed by an officer of the **MANUFACTURER**.

Product

Engineered Thermoplastic Fittings: All plastic fitting components are to be in compliance with applicable ASTM standards.

All pipe connections shall be made using compression fitting connections including a Buna-N o-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

Stainless Steel Curb Stop/Check Valve Assembly: The curb stop shall be pressure-tight in both directions. The ball valve actuator shall include position stop features at the fully opened and closed positions. The curb stop/check valve assembly shall be designed to withstand a working pressure of 235 psi.

The stainless steel check valve shall be integral with the curb stop valve. The check valve will provide a full-ported 1-1/4” passageway and shall introduce minimal friction loss at maximum rated flow. The flapper hinge design shall provide a maximum degree of freedom and ensure seating at low back pressure.

Curb Boxes: Curb boxes shall be constructed of ABS, conforming to ASTM-D 1788. Lid top casting shall be cast iron, conforming to ASTM A-48 Class 25, providing magnetic detectability, and be painted black. All components shall be inherently corrosion-resistant to ensure durability in the ground. Curb boxes shall provide height adjustment downward (shorter) from their nominal height.

High Density Polyethylene Pipe (Supplied by others)

Pipe shall be have a working pressure of 160 psi minimum and shall be classified SDR per ASTM D 3035.

Deviations: If a supplier chooses to submit a bid that does not meet all the requirements of this specification, the bid shall include a written description of the deviation with data that shows the magnitude of the deviation and the justification for the deviation from this specification. The decision to accept material deviating from this specification shall be the responsibility of the **SPECIFYING ENGINEER**.

Certification: The owner or the **SPECIFYING ENGINEER** may request certified lab data to verify the physical properties of the pipe materials supplied under this specification or may take random samples and have them tested by an independent laboratory.

Rejection: Polyethylene pipe may be rejected for failure to meet any of the requirements of this specification.

Pipe Dimensions: The SDR (Standard Dimension Ratio) of the pipe supplied shall be as specified by the **SPECIFYING ENGINEER**. SDR 7, 9 and 11 fittings are available from the **MANUFACTURER**. SIDR 7 fittings will not work with SDR pipe.

Execution

Factory Test: The stainless steel, combination curb stop/check valve component shall be 100 percent hydrostatically tested to 150 psi in the factory.

Construction Practices

Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such a manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.

Segments of pipe having cuts or gouges in excess of 10 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt-fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt-fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.

Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Spreader bars should be used when lifting long, fused sections. Care should be exercised to avoid cutting or gouging the pipe.

Installation

Assemble the compression fittings according to the fitting manufacturer's recommendations.

The trench and trench bottom should be constructed in accordance with ASTM D 2321. Embedment materials should be Class I, Class II or Class III materials as defined in ASTM D 2321. The use of Class IV and/or Class V materials for embedment is not recommended and should be allowed only with the approval of the **SPECIFYING ENGINEER**. Bedding of the pipe should be performed in accordance with ASTM D

2321. Compaction should be as specified in ASTM D 2321. Deviations from the specified compaction shall be approved by the **SPECIFYING ENGINEER**.

Haunching and initial backfill should be as specified in ASTM D 2321 using Class I, Class II or Class III materials. Materials used and compaction shall be as specified by the **SPECIFYING ENGINEER**. In cases where a compaction of 85 percent Standard Proctor Density is not attainable, the **SPECIFYING ENGINEER** may wish to increase the SDR of the pipe to provide adequate stiffness. ASTM D 2321 sections titled "Minimum Cover for Load Application," "Use of Compaction Equipment" and "Removal of Trench Protection" should apply unless directed otherwise by the **SPECIFYING ENGINEER**.

END OF SECTION

Environment One
2773 Balltown Road
Niskayuna, New York 12309

FLYING "W" PLASTICS, Inc.

P.O. BOX 759
GLENVILLE, WV 26351
304-462-5779

PRODUCT SPECIFICATION

Description: 1 1/4" IPS SDR 11 PE3608 (PE3408), AWWA /NSF

O.D. 1660" Average I.D 1.340" Minimum Wall .151" lbs./ft : 0.31

Flying "W" Plastics certifies the above product of be manufactured from select PE3608 (PE3408) high density polyethylene copolymers (see typical properties below) and meet specifications set forth in ASTM F-714. This material meets all of the requirements of ASTM 1248-81A for type PE34 Class C Product. It has outstanding properties of a high hoop stress and a high level of environmental stress crack resistance. These copolymers have NSF 14 and AWWA C901/C906 certification for potable water applications, comply with ANSI/NSF Standard 61 health effects requirement, and are recognized by the Plastics Pipe Institute as having a pipe material designation code of PE3608, PE3408 and PE80.

Property	ASTM Test Method	Typical Values English	Typical Values SI Units
Density (Black)	D 792	___	0.945 g/cm
Melt Index (1)	D 1238	___	8.5g/10min
Tensile Strength @ Yield (2 in/min)	D 638	3250 psi	22.5 MPa
Elongation @ Break (2 in/min)	D 638	>850%	>850%
Flexural Modulus (2)	D 790	125000psi	850 Mpa
Hardness (Shore D)	D 2240	60	60
Vicat Softening Point	D1525	255*F	124*C
Notched Izod Impact Strength	D 256	7 ft-lfb/in	3.7 j/m
Brittleness Temperature	D 746	<-150*F	<-100*C
Hydrostatic Design Basis			
@ 23*C	D2837	1600 psi	11.0 Mpa
@ 60*C	D2837	800 psi	5.5 MPa
Environmental Stress Crack Resistance (3)	D1693	>5000 hrs	>5000 hrs
Notch Tensile (PENT)	F1473	>100 hrs	>100 hrs
Carbon Black Concentration	D1603	2.5% +-5	2.5%+-5steve
Cell Classification	D3350	345464C	345464C

(1) 190* c/21600 g
(2) Tangent Method 1
(3) Condition C
(4) Two inch, SIDR 19

FLYING "W" PLASTICS, Inc.

P.O. BOX 759
GLENVILLE, WV 26351
304-462-5779

PRODUCT SPECIFICATION

Description: 1 1/2" IPS SDR 11 PE3608 (PE3408), AWWA /NSF

O.D. 1.900" Average I.D 1.53" Minimum Wall .173" lbs./ft : 0.41

Flying "W" Plastics certifies the above product of be manufactured from select PE3608 (PE3408) high density polyethylene copolymers (see typical properties below) and meet specifications set forth in ASTM F-714. This material meets all of the requirements of ASTM 1248-81A for type PE34 Class C Product. It has outstanding properties of a high hoop stress and a high level of environmental stress crack resistance. These copolymers have NSF 14 and AWWA C901/C906 certification for potable water applications, comply with ANSI/NSF Standard 61 health effects requirement, and are recognized by the Plastics Pipe Institute as having a pipe material designation code of PE3608, PE3408 and PE80.

Property	ASTM Test Method	Typical Values English	Typical Values SI Units
Density (Black)	D 792	___	0.945 g/cm
Melt Index (1)	D 1238	___	8.5g/10min
Tensile Strength @ Yield (2 in/min)	D 638	3250 psi	22.5 MPa
Elongation @ Break (2 in/min)	D 638	>850%	>850%
Flexural Modulus (2)	D 790	125000psi	850 Mpa
Hardness (Shore D)	D 2240	60	60
Vicat Softening Point	D1525	255*F	124*C
Notched Izod Impact Strength	D 256	7 ft-lfb/in	3.7 j/m
Brittleness Temperature	D 746	<-150*F	<-100*C
Hydrostatic Design Basis			
@ 23*C	D2837	1600 psi	11.0 Mpa
@ 60*C	D2837	800 psi	5.5 MPa
Environmental Stress Crack Resistance (3)	D1693	>5000 hrs	>5000 hrs
Notch Tensile (PENT)	F1473	>100 hrs	>100 hrs
Carbon Black Concentration	D1603	2.5% +-5	2.5%+-5steve
Cell Classification	D3350	345464C	345464C

(1) 190* c/21600 g
(2) Tangent Method 1
(3) Condition C
(4) Two inch, SIDR 19

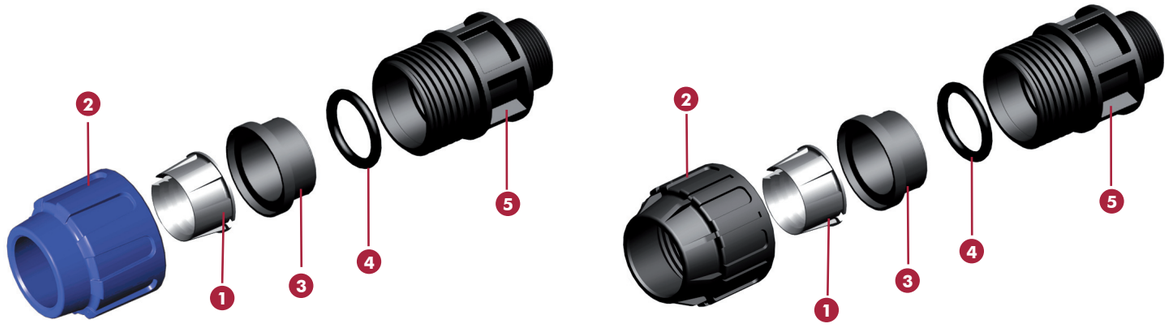
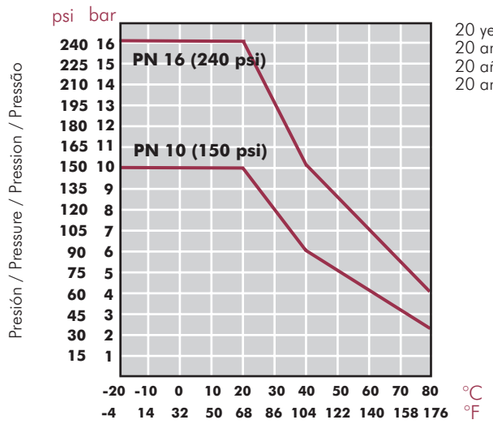


FIG.	Parts	Pièces	Despiece	Peças	Material
1	Split ring	Bague de serrage	Cono de fijación	Cone de fixação	POM
2	Nut	Ecrou	Tuerca	Porca	PP
3	Insert	Bague de compression	Casquillo prensa	Casquilho de pressão	PP
4	O-ring	Joint torique	Junta tórica	Junta torica	NBR 70 (*)
5	Body	Corps	Cuerpo	Corpo	PP

(*) Performance Series NBR: potable water rubber
NBR: joint eau potable
NBR: junta agua potable
NBR: junta água potável

Pressure/temperature graph
Diagramme pression/température
Diagrama presión/temperatura
Diagrama de pressão/temperatura



20 years / water flow
20 années / fluide de l'eau
20 años / fluido de agua
20 anos / caudal de água

Performance of plastic materials in contact with non-dangerous fluids.
The durability of those parts exposed to fluids will depend on the working conditions

Valeurs indicatives pour matières plastiques en contact avec des fluides non dangereux.
La longévité des pièces exposées aux fluides dépendra des conditions de travail.

Valores indicativos para materiales en contacto con fluidos no peligrosos.
La vida en las partes expuestas a los fluidos dependerá de las condiciones de trabajo.

Valores indicativos para materiais em contacto com fluídos não agressivos.
A durabilidade das partes expostas aos fluidos depende das condições de trabalho.

Nº 02 LATIN - EDITION: 08/2010 - xxxxxxxxxxxxxxxxxxxxxxxxxxxx

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FOR MORE INFORMATION VISIT
www.cepex.com

PP Compression Fittings
Raccords à compression en PP
Accesorios de compresión en PP
Acessórios de junta rápida em PP

Performance & Standard Series
02

- Quality and reliability
- Peformance & Standard Series
- Size range from D16 up to D110
- Tested & approved by the main testing institutes worldwide

- Qualité et fiabilité
- Séries Peformance et Standard
- Dimensions du D16 au D110
- Testés et analysés par les organismes les plus importants dans le monde

- Calidad y fiabilidad
- Series Peformance y Standard
- Rango de medidas desde D16 hasta D110
- Analizados y aprovados por los más importantes institutos a nivel mundial

- Qualidade e fiabilidade
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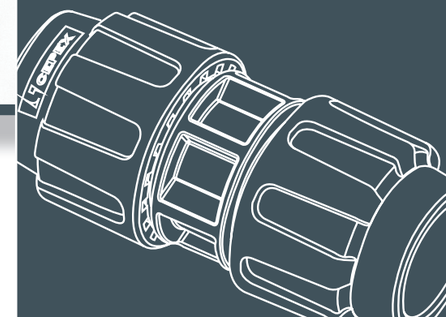


Compression Fittings

Performance Series

Elbows
Coudes
Codos
Joelhos

Tees
Tés
Tés
Tes

Couplings
Manchons
Manguitos
União

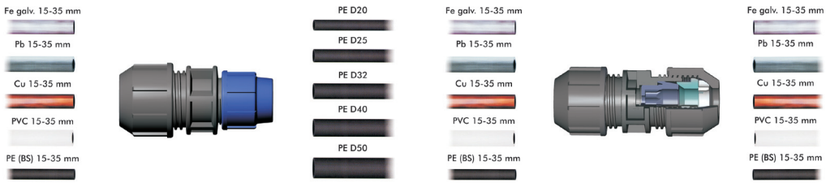
Standard Series

Elbows
Coudes
Codos
Joelhos

Tees
Tés
Tés
Tes

Couplings
Manchons
Manguitos
União

Universal fitting
Accessoire universel
Accesorio universal
Acessório universal



Accesorios con **fácil inserción** de tubo y **perfecta sujeción** del mismo
Accesorios con **fácil inserción** de tubo y **perfecta sujeción** del mismo
Accesorios con **fácil inserción** de tubo y **perfecta sujeción** del mismo
Accesorios con **fácil inserción** de tubo y **perfecta sujeción** del mismo

Tuercas con **nervios más gruesos** para mayor resistencia y facilidad de apriete
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Tuercas con **nervios más gruesos** para mayor resistencia y facilidad de apriete

Tested and approved by the main testing institutes worldwide
Approuvés par les principaux organismes de certification internationnaux
Aprovado por los principales organismos certificadores mundiales
Aprovados pelos principais institutos certificadores internacionais

The entire production process, from product conception to delivery to the customer, is developed using the most advanced technologies to guarantee the highest quality

Le processus de production, depuis la conception du produit jusqu'à sa livraison chez le client, se déroule en utilisant les technologies les plus avancées afin de garantir une qualité maximale

El proceso productivo, desde la concepción del producto hasta la entrega al cliente se desarrolla usando la tecnología más avanzada para asegurar la mayor calidad

No processo produtivo desde a concepção do produto até à entrega ao cliente, utiliza-se a tecnologia mais avançada para garantir a máxima qualidade

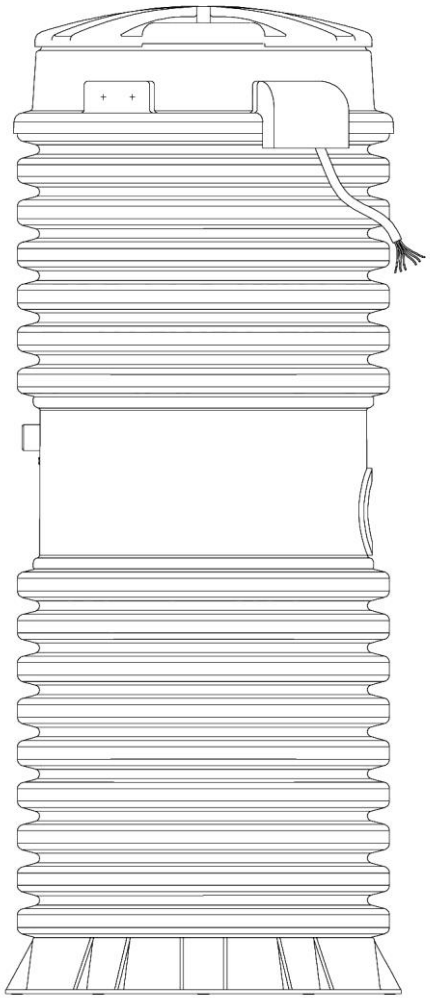
Description
• PP Compression Fittings for PE pressure piping applications.
• Fast & reliable connections. Split ring opening has been optimized to make pipe insertion even easier. Inner nerves prevent the pipe from turning during installation.
• Perfect sealing in all conditions. When tightened and due to seat inclination, o-ring makes pressure against the pipe, providing superior watertightness.
• Extensively used worldwide.
• Approved for use with potable water.
Range
• From D16 up to D110 - Performance Series.
• From D16 up to D63 - Standard Series.
Standards
• Dimensions and characteristics according to EN 712/713/715/911; ISO 3501/3503/3458/3459.
• To be installed on PE pipes conforming to ISO 11922; DIN 8072/8074; UNE 53131.
• Also approved for use with PVC flexible hose (contact us for available sizes).
• Threads (BSP) manufactured according to standard ISO 7; DIN 2999.
Working pressure
• At 20ºC D16 - D63: PN 16 (threaded fittings and Standard Series: PN 10)
D75 - D110: PN 10
Applications
• Water distribution, industry, irrigation, etc. - Performance Series
• Irrigation, swimming pools, cable ducts, etc. - Standard Series

Description
• Raccords en PP pour canalisations de PE sous pression.
• Connexion rapide et fiable. Le tube est encore plus facile à insérer grâce aux modifications apportées à la bague de serrage. La conception de la bague de serrage évite au tube de tourner durant le serrage de l'écrou.
• Parfaite étancheité dans toutes les conditions de travail. Encore plus étanche grâce à l'inclinaison de siège recevant le joint.
• De nombreuses références dans le monde entier.
• Adapté à une utilisation "eau potable" (Série Performance).
Dimensions
• Du D16 au D110 - Série Performance.
• Du D16 au D63 - Série Standard.
Standards
• Dimensions et caractéristiques selon les normes EN 712/713/715/911; ISO 3501/3503/3458/3459.
• Pour installer sur du tube PE conforme aux normes ISO 11922; DIN 8072/8074; UNE 53131.
• Compatible avec le tube PVC souple.
• Filetages (BSP) fabriqués selon les standards ISO 7; DIN 2999.
Pression de service
• A 20ºC D16 - D63: PN 16 (accessoires filetés et Série Standard: PN 10)
D75 - D110: PN 10
Domaines d'application
• Adduction d'eau, industrie, irrigation, etc. - Série Performance
• Irrigation, piscines, câblages, etc. - Série Standard

Descripción
• Accesorios en PP para canalizaciones de PE a presión.
• Conexiones rápidas y fiables. Se ha optimizado la apertura del cono de fijación para que la inserción del tubo resulte aún más fácil. Los nervios interiores previenen que el tubo gire durante la instalación.
• Estanqueidad perfecta en todas las condiciones de trabajo. La inclinación del asiento permite a la junta ejercer presión contra el tubo.
• Usados extensamente a nivel mundial.
• Aprobados para uso con agua potable (Serie Performance).
Medidas
• Desde D16 hasta D110 - Serie Performance.
• Desde D16 hasta D63 - Serie Standard.
Standards
• Dimensiones y características según las normas EN 712/713/715/911; ISO 3501/3503/3458/3459.
• Para instalar en tubería de PE conforme a las normas ISO 11922; DIN 8072/ 8074; UNE 53131. Posibilidad de instalación con tubo flexible PVC (consultar).
• Roscas (BSP) fabricados según el standard ISO 7; DIN 2999.
Presión de servicio
• A 20ºC D16 - D63: PN 16 (accesorios roscados y Serie Standard: PN 10)
D75 - D110: PN 10
Aplicaciones
• Distribución de agua, industria, riego, etc. - Serie Performance
• Riego, piscinas, conducciones de cable, etc. - Serie Standard

Descrição
• Acessórios junta rápida para aplicação em tubagem PE pressão.
• Ligações rápidas e fiáveis. Cone de fixação foi optimizado para que a instalação seja ainda mais fácil. Aneis internos que não deixam que o tubo se mova durante a instalação.
• Vedação perfeita em todas as condições. Quando apertado devidamente na tubagem, o O-Ring faz pressão contra O tubo, gerando uma superior estanquidade e impermeabilidade.
• Utilizado extensivamente a nível mundial. Aprovado para o uso com água potável (Série Performance).
Medidas
• Desde D16 até D110 - Série Performance.
• Desde D16 até D63 - Série Standard.
Standards
• Dimensões e características de acordo com EN 712/713/715/911; ISO 3501/3503/3458/3459.
• Para ser instalado com tubos PE conformes com ISO 11922; DIN 8072/8074; UNE 53131. Possibilidade de instalação com tubo flexível de PVC (consultar).
• Ligações (BSP) fabricadas de acordo com os standard ISO 7; DIN 2999.
Pressão de serviço
• A 20ºC D16 - D63: PN 16 (peças roscadas e Série Standard: PN 10)
D75 - D110: PN 10
Applicações
• Distribução de água, indústria, rega, etc. - Série Performance
• Rega, piscinas, conduções de cabo, etc. - Série Standard

E/ONE EXTREME SERIES



D-Series Wetwell/Drywell Grinder Pump Station with Wired Level Sensor

Typical Specifications

Semi-Positive Displacement Type Grinder Pump Stations with 5-Year Warranty

1.0 GENERAL

1.01 GENERAL DESCRIPTION: The **MANUFACTURER** shall furnish complete factory-built and tested Wetwell/Drywell Grinder Pump Station(s), each consisting of grinder pump(s) suitably mounted in a basin constructed of high density polyethylene (HDPE) for simplex stations and HDPE or Fiberglass Reinforced Polyester Resin for duplex stations with dimensions and capacities as show on the Contract Drawings, NEMA 6P electrical quick disconnect (EQD), pump removal system, stainless steel discharge assembly/shut-off valve, anti-siphon valve/check valve, each assembled in the basin, electrical alarm panel and all necessary internal wiring and controls. Component type grinder pump systems that require field assembly will not be acceptable due to the potential problems that can occur during field assembly. All components and materials shall be in accordance with section 2.0 of this Product Specification. For ease of serviceability, all pump, motor/grinder units shall be of like type and horsepower throughout the system.

1.02 SUBMITTALS: After receipt of notice to proceed, the **MANUFACTURER** shall furnish a minimum of six sets of shop drawings detailing the equipment to be furnished including dimensional data and materials of construction. The **ENGINEER** shall promptly review this data, and return two copies as accepted, or with requested modifications. Upon receipt of accepted shop drawings, the **MANUFACTURER** shall proceed immediately with fabrication of the equipment.

1.03 MANUFACTURER: Grinder pump stations, complete with all appurtenances, form an integral system, and as such, shall be supplied by one grinder pump station manufacturer. The **CONTRACTOR** shall be responsible for the satisfactory operation of the entire system. The equipment specified shall be a product of a company experienced in the design and manufacture of grinder pumps for specific use in low pressure sewage systems. The company shall submit detailed installation and user instructions for its product, submit evidence of an established service program including complete parts and service manuals, and be responsible for maintaining a continuing inventory of grinder pump replacement parts. The **MANUFACTURER** shall provide, upon request, a reference and contact list from ten of its largest contiguous grinder pump installations of the type of grinder pumps described within this specification.

The **MANUFACTURER** of the grinder pump station shall be Environment One Corporation (or Proposed Alternate).

Attention is directed to the fact that the drawings and overall system design are based on a particular piece of equipment from a particular manufacturer. These specifications are intended to provide guidelines for standard equipment of a recognized manufacturer who already meets all the requirements of this specification.

1.03a ALTERNATE EQUIPMENT: In the event that the **CONTRACTOR** or another supplier proposes an Alternate to the specified **MANUFACTURER**, the **ENGINEER** recognizes that it will be difficult to conform to certain details of this Specification due to different manufacturing techniques or grinder pump station designs. If proposing an Alternate, the **CONTRACTOR** (supplier) must submit, no less than 15 business days in advance of the bid date, a complete description of any changes that will be necessary to the system design, a complete submittal package as outlined in Section 1.02 SUBMITTALS, a system hydraulic analysis based on the proposed pump (including pipe sizes, flows, velocities, retention times and number and location of recommended valves and cleanouts, if any), a list of exceptions to this specification, and demonstration of compliance to Section 1.04 EXPERIENCE CLAUSE of this specification. The **CONTRACTOR** (supplier) must also complete the Manufacturer Disclosure Statement found at the end of this specification. This information must be submitted to the **ENGINEER** for pre-approval of the alternate equipment being proposed and determination of compliance with these Contract Documents. If the equipment differs materially or differs from the dimensions given on the Drawings, the **CONTRACTOR** (supplier) shall submit complete drawings showing elevations, dimensions, or any necessary changes to the Contract Documents for the proposed equipment and its installation. Pre-approval, if granted, will be provided in writing by the **ENGINEER** to the **CONTRACTOR** (supplier) at least five business days in advance of the bid date. If the **ENGINEER'S** approval is obtained for Alternate Equipment, the **CONTRACTOR** (supplier) must make any needed changes in the structures, system design, piping or electrical systems necessary to accommodate the proposed equipment at the expense of the **CONTRACTOR** (supplier).

1.04 EXPERIENCE CLAUSE: The equipment furnished hereunder shall be the product of a company experienced in the design and manufacture of grinder pumps specifically designed for use in low pressure systems. All manufacturers proposing equipment for this project shall have at least 10 years of experience in the design and manufacture of units of identical size(s) and performance to the specified units. All manufacturers proposing equipment for this project must also have not less than 500 successful installations of low pressure sewer systems utilizing grinder pumps of like type to the grinder pumps specified herein. An installation is defined as a minimum of 25 pumps discharging into a common force main which forms a low pressure sewer system. The **CONTRACTOR** (supplier) proposing alternate equipment shall also submit, as part of the bid schedule, an installation list with contact person(s), phone number(s) and date(s) of at least 10 installations of the type of pump specified herein that have been in operation for at least 10 years.

In lieu of this experience clause, the **CONTRACTOR** (supplier) of alternate equipment will be required to submit a 5-year performance bond for 100 percent of the stipulated cost of the equipment as bid and as shown in the Bid Schedule. This performance bond will be used to guarantee the replacement of the equipment in the event that it fails within the bond period.

1.05 OPERATING CONDITIONS: The pumps shall be capable of delivering 15 GPM against a rated total dynamic head of 0 feet (0 PSIG), 11 GPM against a rated total dynamic head of 92 feet (40 PSIG), and 7.8 GPM against a rated total dynamic head of 185 feet (80 PSIG). The pump(s) must also be capable of operating at negative total dynamic head without overloading the motor(s). Under no conditions shall in-line piping or valving be allowed to create a false apparent head.

1.06 WARRANTY: The grinder pump **MANUFACTURER** shall provide a part(s) and labor warranty on the complete station and accessories, including, but not limited to, the panel for a period of 24 months after notice of **OWNER'S** acceptance, but no greater than 27 months after receipt of shipment. Any manufacturing defects found during the warranty period will be reported to the **MANUFACTURER** by the **OWNER** and will be corrected by the **MANUFACTURER** at no cost to the **OWNER**. "**In lieu of the above warranty, a no-charge, 5 Year Certified Simplex Station Warranty with the same coverage as E/One's Standard Warranty will be granted if the Simplex Installation utilizes; a Protect Plus Panel, the E/One online Certified Installation and Start-Up E/Cert System and an E/One Stainless Steel Curb Stop Assembly."**

1.07 WARRANTY PERFORMANCE CERTIFICATION: As a bid certification requirement, each bidder shall provide with their bid schedule a Warranty Performance Certification statement executed by the most senior executive officer of the grinder pump **MANUFACTURER**, which certifies a minimum of a 24-month warranty. They must further detail any exclusions from the warranty or additional cost items required to maintain the equipment in warrantable condition, including all associated labor and shipping fees, and certify that the **MANUFACTURER** will bear **all** costs to correct any original equipment deficiency for the effective period of the warranty. All preventive maintenance type requirements shall be included in this form as exclusions. These requirements include, but are not limited to, unjamming of grinder mechanism, periodic motor maintenance, and periodic cleaning of liquid level controls. Should the **CONTRACTOR** (supplier) elect to submit a performance bond in lieu of the experience clause outlined above, this Warranty Performance Certification shall also be used as a criterion to evaluate the **CONTRACTOR'S** (supplier's) performance over the warranty period. A Warranty Performance Certification form is included with the bid schedule and must be completed and submitted as part of the bid package. Bids with incomplete forms or missing forms will be considered nonresponsive.

2.0 PRODUCT

2.01 PUMP: The pump shall be a custom designed, integral, vertical rotor, motor driven, solids handling pump of the **progressing cavity type** with a single mechanical seal. Double radial O-ring seals are required at all casting joints to minimize corrosion and create a protective barrier. All pump castings shall be cast iron, fully epoxy coated to 8-10 mil Nominal dry thickness, wet applied. The rotor shall be through-hardened, highly polished, precipitation hardened stainless steel. The stator shall be of a specifically compounded ethylene propylene synthetic elastomer. This material shall be suitable for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance,

grease resistance, water and detergent resistance, temperature stability, excellent aging properties, and outstanding wear resistance. Buna-N is not acceptable as a stator material because it does not exhibit the properties as outlined above and required for wastewater service.

2.02 GRINDER: The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece motor shaft. The grinder impeller (cutter wheel) assembly shall be securely fastened to the pump motor shaft by means of a threaded connection attaching the grinder impeller to the motor shaft. Attachment by means of pins or keys will not be acceptable. The grinder impeller shall be a one-piece, 4140 cutter wheel of the rotating type with inductively hardened cutter teeth. The cutter teeth shall be inductively hardened to Rockwell 50 – 60c for abrasion resistance. The shredder ring shall be of the stationary type and the material shall be white cast iron. The teeth shall be ground into the material to achieve effective grinding. The shredder ring shall have a staggered tooth pattern with only one edge engaged at a time, maximizing the cutting torque. These materials have been chosen for their capacity to perform in the intended environment as they are materials with wear and corrosive resistant properties.

This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to minimize clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour the tank free of deposits or sludge banks which would impair the operation of the pump. These requirements shall be accomplished by the following, in conjunction with the pump:

1. The grinder shall be positioned in such a way that solids are fed in an upward flow direction.

2. The maximum flow rate through the cutting mechanism must not exceed 4 feet per second. This is a critical design element to minimize jamming and as such must be adhered to.

3. The inlet shroud shall have a diameter of no less than 5 inches. Inlet shrouds that are less than 5 inches in diameter will not be accepted due to their inability to maintain the specified 4 feet per second maximum inlet velocity which by design prevents unnecessary jamming of the cutter mechanism and minimizes blinding of the pump by large objects that block the inlet shroud.

4. The impeller mechanism must rotate at a nominal speed of no greater than 1800 rpm.

The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of “foreign objects,” such as paper, wood, plastic, glass, wipes, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1-1/4" diameter stainless steel discharge piping.

2.03 ELECTRIC MOTOR: As a maximum, the motor shall be a 1 HP, 1725 RPM, 240 Volt 60 Hertz, 1 Phase, capacitor start, ball bearing, air-cooled induction type with Class F installation, low starting current not to exceed 30 amperes and high starting torque of 8.4 foot pounds. The motor shall be press-fit into the casting for better heat transfer and longer winding life. Inherent protection against running overloads or locked rotor conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by Underwriters Laboratories, Inc., for the application. Non-capacitor start motors or permanent split capacitor motors will not be accepted because of their reduced starting torque and consequent diminished grinding capability. The wet portion of the motor armature must be 300 Series stainless. To reduce the potential of environmental concerns, the expense of handling and disposing of oil, and the associated maintenance costs, oil-filled motors will not be accepted.

2.04 MECHANICAL SEAL: The pump/core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating surface with faces precision lapped and held in position by a stainless steel spring.

2.05 TANK AND INTEGRAL ACCESSWAY: **(Model DH071) High Density Polyethylene Construction.** The tank shall be a Wetwell/Drywell design made of high density polyethylene, with a grade selected to provide the necessary environmental stress cracking resistance. Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. The corrugations of the outside wall are to be a minimum amplitude of 1-1/2" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be 0.250” thick (minimum). All seams created during tank construction are to be thermally welded and factory tested for leak tightness. The tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth. All station components must function normally when exposed to 150 percent of the maximum external soil and hydrostatic pressure.

The tank shall be furnished with one EPDM grommet fitting to accept a 4.50" OD DWV or Schedule 40 pipe. The tank capacities shall be as shown on the contract drawings.

The Drywell accessway shall be an integral extension of the Wetwell assembly and shall include a lockable cover assembly providing low profile mounting and watertight capability. The accessway design and construction shall enable field adjustment of the station height in increments of 4" or less without the use of any adhesives or sealants requiring cure time before installation can be completed.

The station shall have all necessary penetrations molded in and factory sealed. To ensure a leak free installation no field penetrations will be acceptable.

All discharge piping shall be constructed of 304 stainless steel. The discharge shall terminate outside the accessway bulkhead with a stainless steel, 1-1/4” Female NPT fitting. The discharge piping shall include a stainless steel ball valve rated for 235 psi WOG; PVC ball valves or brass ball/gate will not be accepted. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.

The accessway shall include a single NEMA 6P Electrical Quick Disconnect (EQD) for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The EQD will be supplied with 32’, 25’ of useable Electrical Supply Cable (ESC) outside the station, to connect to the alarm panel. The ESC shall be installed in the basin by the manufacturer. Field assembly of the ESC into the basin is not acceptable because of potential workmanship issues. The EQD shall require no tools for connecting, seal against water before the electrical connection is made, and include radial seals to assure a watertight seal regardless of tightening torque. Plug-type connections of the power cable onto the pump housing will not be acceptable due to the potential for leaks and electrical shorts. A junction box shall not be permitted in the accessway due to the large number of potential leak points. The EQD shall be so designed to be conducive to field wiring as required. The accessway shall also include an integral 2-inch vent to prevent sewage gases from accumulating in the tank.

2.06 TANK & INTEGRAL ACCESSWAY: **(Models DH151 150 Gallon Simplex & DH152 150 Gallon Duplex) High Density Polyethylene Construction.** The tank shall be a Wetwell/Drywell design made of high density polyethylene, with a grade selected to provide the necessary environmental stress cracking resistance. Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. The corrugations of the outside wall are to be a minimum amplitude of 1-1/2" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be 0.250” thick (minimum). All seams created during tank construction are to be thermally welded and factory tested for leak tightness. The tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth. All station components must function normally when exposed to 150 percent of the maximum external soil and hydrostatic pressure.

The tank shall be furnished with one EPDM grommet fitting to accept a 4.50" OD DWV or Schedule 40 pipe. The tank capacities shall be as shown on the contract drawings.

The Drywell accessway shall be an integral extension of the Wetwell assembly and shall include a lockable cover assembly providing low profile mounting and watertight capability. The cover shall be high density polyethylene, green in color, with a load rating of 150 lbs per square foot. The accessway design and construction shall enable field adjustment of the station height in increments of 3" or less without the use of any adhesives or sealants requiring cure time before installation can be completed.

The station shall have all necessary penetrations molded in and factory sealed. To ensure a leak free installation no field penetrations will be acceptable.

All discharge piping shall be constructed of 304 stainless steel. The discharge shall terminate outside the accessway bulkhead with a stainless steel, 1-1/4” Female NPT fitting. The discharge piping shall include a stainless steel ball valve rated for 235 psi WOG; PVC ball valves or brass ball/gate will not be accepted. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.

The accessway shall include a single NEMA 6P Electrical Quick Disconnect (EQD) for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The EQD will be supplied with 32’, 25’ of useable Electrical Supply Cable (ESC) outside the station, to connect to the alarm panel. The ESC shall be installed in the basin by the manufacturer. Field assembly of the ESC into the basin is not acceptable because of potential workmanship issues. The EQD shall require no tools for connecting, seal against water before the electrical connection is made, and include radial seals to assure a watertight seal regardless of tightening torque. Plug-type connections of the power cable onto the pump housing will not be acceptable due to the potential for leaks and electrical shorts. A junction box shall not be permitted in the accessway due to the large number of potential leak points. The EQD shall be so designed to be conducive to field wiring as required. The accessway shall also include an integral 2-inch vent to prevent sewage gases from accumulating in the tank.

2.07 TANK & INTEGRAL ACCESSWAY: **(DH272, 275-Gallon Duplex & DH502, 500-Gallon Duplex) Fiberglass reinforced polyester resin.** The tank shall be a Wetwell/Drywell design custom molded of fiberglass reinforced polyester resin with a high density polyethylene accessway. Accessway corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. The corrugations of the outside wall are to be a minimum amplitude of 1-1/2" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be 0.250” thick (minimum). All polyethylene seams created during tank construction are to be thermally welded and factory tested for leak tightness. The tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth. All station components must function normally when exposed to 150 percent of the maximum external soil and hydrostatic pressure.

The tank shall be furnished with one EPDM grommet fitting to accept a 4.50" OD DWV or Schedule 40 pipe. The tank capacities shall be as shown on the contract drawings.

The Drywell accessway shall be an integral extension of the Wetwell assembly and shall include a lockable cover assembly providing low profile mounting and watertight capability. The cover shall be high density polyethylene, green in color, with a load rating of 150 lbs per square foot. The accessway design and construction shall enable field adjustment of the station height in increments of 4" or less without the use of any adhesives or sealants requiring cure time before installation can be completed.

The station shall have all necessary penetrations molded in and factory sealed. To ensure a leak free installation no field penetrations will be acceptable.

All discharge piping shall be constructed of 304 stainless steel. The discharge shall terminate outside the accessway bulkhead with a stainless steel, 1-1/4” Female NPT fitting. The discharge piping shall include a stainless steel ball valve rated for 235 psi WOG; PVC ball valves or brass ball/gate will not be accepted. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.

The accessway shall include a single NEMA 6P Electrical Quick Disconnect (EQD) for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The EQD will be supplied with 32', 25' of useable Electrical Supply Cable (ESC) outside the station, to connect to the alarm panel. The ESC shall be installed in the basin by the manufacturer. Field assembly of the ESC into the basin is not acceptable because of potential workmanship issues. The EQD shall require no tools for connecting, seal against water before the electrical connection is made, and include radial seals to assure a watertight seal regardless of tightening torque. Plug-type connections of the power cable onto the pump housing will not be acceptable due to the potential for leaks and electrical shorts. A junction box shall not be permitted in the accessway due to the large number of potential leak points. The EQD shall be so designed to be conducive to field wiring as required. The accessway shall also include an integral 2-inch vent to prevent sewage gases from accumulating in the tank.

2.08 CHECK VALVE: The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type integral check valve built into the stainless steel discharge piping. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than 6 inches of water at maximum rated flow. Moving parts will be made of a 300 Series stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly providing a maximum degree of freedom to assure seating even at a very low back-pressure. The valve body shall be an injection molded part made of an engineered thermoplastic resin. The valve shall be rated for continuous operating pressure of 235 psi. Ball-type check valves are unacceptable due to their limited sealing capacity in slurry applications.

2.09 ANTI-SIPHON VALVE: The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the stainless steel discharge piping. Moving parts will be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure. The valve body shall be injection-molded from an engineered thermoplastic resin. Holes or ports in the discharge piping are not acceptable anti-siphon devices due to their tendency to clog from the solids in the slurry being pumped. The anti-siphon port diameter shall be no less than 60% of the inside diameter of the pump discharge piping.

2.10 CORE UNIT: The grinder pump station shall have a cartridge type, easily removable core assembly consisting of pump, motor, grinder, all motor controls, check valve, anti-siphon valve, level controls, electrical quick disconnect and wiring. The core unit shall be installed in the basin by the manufacturer. Field assembly of the pump and controls into the basin is not acceptable because of potential workmanship issues and increased installation time. In some cases, stations taller than 96" may be shipped on their side without the cores assembled in the basin for freight purposes but this is the only exception. The core unit shall seal to the tank deck with a stainless steel latch assembly. The latch assembly must be actuated utilizing a single quick release mechanism requiring no more than a half turn of a wrench. The watertight integrity of each core unit shall be established by a 100 percent factory test at a minimum of 5 PSIG.

2.11 CONTROLS: All necessary motor starting controls shall be located in the cast iron enclosure of the core unit secured by stainless steel fasteners. Locating the motor starting controls in a plastic enclosure is not acceptable. The wastewater level sensing controls shall be housed in a separate enclosure from motor starting controls. The level sensor housing must be sealed via a radial type seal; solvents or glues are not acceptable. The level sensing control housing must be integrally attached to pump assembly so that it may be removed from the station with the pump and in such a way as to minimize the potential for the accumulation of grease and debris accumulation, etc. The level sensing housing must be a high-impact thermoplastic copolymer over-molded with a thermo plastic elastomer. The use of PVC for the level sensing housing is not acceptable.

Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. The air

column shall be integrally molded from a thermoplastic elastomer suitable for use in wastewater and with excellent impact resistance. The air column shall have only a single connection between the water level being monitored and the pressure switch. Any connections are to be sealed radially with redundant O-rings. The level detection device shall have no moving parts in direct contact with the wastewater and shall be integral to the pump core assembly in a single, readily-exchanged unit. Depressing the push to run button must operate the pump even with the level sensor housing removed from the pump.

All fasteners throughout the assembly shall be 300 Series stainless steel. High-level sensing will be accomplished in the manner detailed above by a separate air column sensor and pressure switch of the same type. Closure of the high-level sensing device will energize an alarm circuit as well as a redundant pump-on circuit. For increased reliability, pump ON/OFF and high-level alarm functions shall not be controlled by the same switch. Float switches of any kind, including float trees, will not be accepted due to the periodic need to maintain (rinsing, cleaning) such devices and their tendency to malfunction because of incorrect wiring, tangling, grease buildup, and mechanical cord fatigue. To assure reliable operation of the pressure switches, each core shall be equipped with a factory installed equalizer diaphragm that compensates for any atmospheric pressure or temperature changes. Tube or piping runs outside of the station tank or into tank-mounted junction boxes providing pressure switch equalization will not be permitted due to their susceptibility to condensation, kinking, pinching, and insect infestation. The grinder pump will be furnished with a 6 conductor 14 gauge, type SJOW cable, pre-wired and watertight to meet UL requirements with a **FACTORY INSTALLED** NEMA 6P EQD half attached to it.

2.12 STAINLESS STEEL CURB STOP/CHECK VALVE ASSEMBLY (UNI-LATERAL REQUIRED FOR 5 YEAR WARRANTY): The curb stop shall be pressure-tight in both directions. The ball valve actuator shall include position stop features at the fully opened and closed positions. The curb stop/check valve assembly shall be designed to withstand a working pressure of 235 psi.

The stainless steel check valve shall be integral with the curb stop valve. The check valve will provide a full-ported 1-1/4" passageway and shall introduce minimal friction loss at maximum rated flow. The flapper hinge design shall provide a maximum degree of freedom and ensure seating at low back pressure.

Engineered Thermoplastic Fittings – All plastic fitting components are to be in compliance with applicable ASTM standards.

All pipe connections shall be made using compression fitting connections including a Buna-N O-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

Curb Boxes – Curb boxes shall be constructed of ABS, conforming to ASTM-D 1788. Lid top casting shall be cast iron, conforming to ASTM A-48 Class 25, providing magnetic detectability, and be painted black. All components shall be inherently corrosion-resistant to ensure durability in the ground. Curb boxes shall provide height adjustment downward (shorter) from their nominal height.

High Density Polyethylene Pipe (Supplied by others) – Pipe shall be have a working pressure of 160 psi minimum and shall be classified SDR per ASTM D 3035.

Pipe Dimensions – The SDR (Standard Dimension Ratio) of the pipe supplied shall be as specified by the **SPECIFYING ENGINEER**. SDR 7, 9 and 11 fittings are available from the **MANUFACTURER**.

Factory Test – The stainless steel, combination curb stop/check valve component shall be 100 percent hydrostatically tested to 150 psi in the factory.

Construction Practices – Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such a manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.

Segments of pipe having cuts or gouges in excess of 10 percent of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt-fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt-fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.

Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Spreader bars should be used when lifting long, fused sections. Care should be exercised to avoid cutting or gouging the pipe.

Installation – Assemble the compression fittings according to the fitting manufacturer's recommendations.

The trench and trench bottom should be constructed in accordance with ASTM D 2321. Embedment materials should be Class I, Class II or Class III materials as defined in ASTM D 2321. The use of Class IV and/or Class V materials for embedment is not recommended and should be allowed only with the approval of the **SPECIFYING ENGINEER**. Bedding of the pipe should be performed in accordance with ASTM D 2321. Compaction should be as specified in ASTM D 2321. Deviations from the specified compaction shall be approved by the **SPECIFYING ENGINEER**.

Haunching and initial backfill should be as specified in ASTM D 2321 using Class I, Class II or Class III materials. Materials used and compaction shall be as specified by the **SPECIFYING ENGINEER**. In cases where a compaction of 85 percent Standard Proctor Density is not attainable, the **SPECIFYING ENGINEER** may wish to increase the SDR of the pipe to provide adequate stiffness. ASTM D 2321 sections titled "Minimum Cover for Load Application," "Use of Compaction Equipment" and "Removal of Trench Protection" should apply unless directed otherwise by the **SPECIFYING ENGINEER**.

2.13 ALARM PANEL SENTRY SIMPLEX PROTECT PLUS (required for 5 year warranty): Each grinder pump station shall include a NEMA 4X, UL-listed alarm panel suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic polyester to ensure corrosion resistance. The enclosure shall include a hinged, lockable cover with padlock, preventing access to electrical components, and creating a secured safety front to allow access only to authorized personnel. The enclosure shall not exceed 12.5" W x 16" H x 7.5" D.

The alarm panel shall contain one 15-amp, double-pole circuit breaker for the pump core's power circuit and one 15-amp, single-pole circuit breaker for the alarm circuit. The panel shall contain a push-to-run feature, an internal run indicator, and a complete alarm circuit. All circuit boards in the alarm panel are to be protected with a conformal coating on both sides and the AC power circuit shall include an auto resetting fuse.

The alarm panel shall include the following features: external audible and visual alarm; push-to-run switch; push-to-silence switch; redundant pump start; and high level alarm capability. The alarm sequence is to be as follows when the pump and alarm breakers are on:

1. When liquid level in the sewage wet-well rises above the alarm level, the contacts on the alarm pressure switch activate, audible and visual alarms are activated, and the redundant pump starting system is energized.

2. The audible alarm may be silenced by means of the externally mounted, push-to-silence button.

3. Visual alarm remains illuminated until the sewage level in the wet-well drops below the "off" setting of the alarm pressure switch.

The visual alarm lamp shall be inside a red, oblong lens at least 3.75" L x 2.38" W x 1.5" H. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating.

The audible alarm shall be externally mounted on the bottom of the enclosure, capable of 93 dB @ 2 feet. The audible alarm shall be capable of being deactivated by depressing a push-type switch that is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure (push-to-silence button).

The entire alarm panel, as manufactured and including any of the following options shall be listed by Underwriters Laboratories, Inc.

SENTRY SIMPLEX PROTECT PLUS key features:

- All Sentry Protect features (as detailed above)
- High/Low Voltage monitoring with Trouble indication
- High/Low Wattage (wattage is used instead of current because it is a better indicator of pump performance) monitoring with Trouble indication
- Extended Run Time monitoring with Trouble indication
- Cycle/Event Counter
- Run Time Counter (Hour Meter)
- Run Time Limit — time adjustable, user-selected options: 10 minutes (default) to 120 minutes in 1-minute intervals
- Power-up Delay — time adjustable, user-selected options: None (default), to 300 minutes in 1-minute intervals
- Alarm Delay — time adjustable, user-selected options: None (default) or adjustable in 1-minute intervals
- System self-test diagnostic
- User-selectable Alarm latch
- User-selectable Protect Mode disable
- User-selectable buzzer timer

Specific Protect PLUS indicators and programming features shall include:

- Ready LED to indicate AC power to the station is satisfactory
- Pump Run LED to indicate pump is operating
- Trouble LED indicator and predictive Visual Alarm notification (“blinking” alarm lamp; clears on Normal cycle)
- High Level Alarm LED indicator
- Manual Run switch to manually activate pump
- Menu-driven programmable controller with navigation overlay-type buttons (Enter, Scroll, Up, Down)
- Normal Operation LED and Mode button for Mode status
- Pump Performance menu LED with LCD Display of the following pump performance statistics:
    - Real-time Voltage
    - Real-time Amperage
    - Real-time Wattage
    - Minimum/Maximum/Average Voltage
    - Minimum/Maximum/Average Amperage
    - Minimum/Maximum/Average Wattage
    - Minimum/Maximum Run-time
    - Average Run-time
    - Last Run-time
    - Cycle/Event Counter
    - Run Time Counter (Hour Meter)
- Diagnostics Menu LED
- Initialize System Menu LED
- Run Limit Menu LED
- Alarm Delay Menu LED
- Power Delay Menu LED

2.14 SERVICEABILITY: The grinder pump core, including level sensor assembly, shall have two lifting hooks complete with lift-out harness connected to its top housing to facilitate easy core removal when necessary. The level sensor assembly must be easily removed from the pump assembly for service or replacement. All mechanical and electrical connections must provide easy disconnect capability for core unit removal and installation. Each EQD half must include a water-tight cover to protect the internal electrical pins while the EQD is unplugged. A pump push-to-run feature will be provided for field trouble shooting. The push-to-run feature must operate the pump even if the level sensor assembly has been removed from the pump assembly. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

2.15 OSHA CONFINED SPACE: All maintenance tasks for the grinder pump station must be possible without entry into the grinder pump station (as per **OSHA 1910.146**, permit-required confined spaces). *"Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space."*

2.16 SAFETY: The grinder pump shall be free from electrical and fire hazards as required in a residential environment. As evidence of compliance with this requirement, the completely assembled and wired grinder pump station shall be listed by Underwriters Laboratories, Inc. to be safe and appropriate for the intended use. UL listing of components of the station, or third-party testing to UL standard are not acceptable.

The grinder pump shall meet accepted standards for plumbing equipment for use in or near residences, shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the seal of NSF International. Third-party testing to NSF standard is not acceptable.

3.0 EXECUTION

3.01 FACTORY TEST: Each grinder pump shall be submerged and operated for 1.5 minutes (minimum). Included in this procedure will be the testing of all ancillary components such as, the anti-siphon valve, check valve, discharge assembly and each unit's dedicated level controls and motor controls. All factory tests shall incorporate each of the above listed items. Actual appurtenances and controls which will be installed in the field shall be particular to the tested pump only. A common set of appurtenances and controls for all pumps is not acceptable. Certified test results shall be available upon request showing the operation of each grinder pump at two different points on its curve. Additional validation tests include: integral level control performance, continuity to ground and acoustic tests of the rotating components.

The **ENGINEER** reserves the right to inspect such testing procedures with representatives of the **OWNER,** at the **GRINDER PUMP MANUFACTURER'S** facility.

3.02 CERTIFIED SERVICE PROGRAM: The grinder pump **MANUFACTURER** shall provide a program implemented by the **MANUFACTURER'S** personnel as described in this specification to certify the service company as an authorized serviced center. As evidence of this, the **MANUFACTURER** shall provide, when requested, sufficient evidence that they have maintained their own service department for a minimum of 30 years and currently employ a minimum of five employees specifically in the service department.

As part of this program, the **MANUFACTURER** shall evaluate the service technicians as well as the service organization annually. The service company will be authorized by the **MANUFACTURER** to make independent warranty judgments. The areas covered by the program shall include, as a minimum:

1. Pump Population Information — The service company will maintain a detailed database for the grinder pumps in the territory that tracks serial numbers by address.

2. Inventory Management — The service company must maintain an appropriate level of inventory (pumps, tanks, panels, service parts, etc.) including regular inventory review and proper inventory labeling. Service technicians will also maintain appropriate parts inventory and spare core(s) on service vehicles.

3. Service Personnel Certification — Service technicians will maintain their level-specific certification annually. The certifications are given in field troubleshooting, repair, and training.

4. Service Documentation and Records — Start up sheets, service call records, and customer feedback will be recorded and available by the service company.

5. Shop Organization — The service company will keep its service shop organized and pumps will be tagged with site information at all times. The shop will have all required equipment, a test tank, and cleaning tools necessary to service pumps properly.

3.03 **DELIVERY**: All grinder pump units will be delivered to the job site 100 percent completely assembled, including testing, ready for installation. Field installation of the pump in tanks under 96 inches is not allowed. Field installation of the level sensor into the tank is not allowed. Grinder pump stations will be individually mounted on wooden pallets.

3.04 **INSTALLATION**: Earth excavation and backfill are specified under **SITE WORK**, but are also to be done as a part of the work under this section, including any necessary sheeting and bracing.

The **CONTRACTOR** shall be responsible for handling ground water to provide a firm, dry subgrade for the structure, and shall guard against flotation or other damage resulting from general water or flooding.

The grinder pump stations shall not be set into the excavation until the installation procedures and excavation have been approved by the **ENGINEER**.

Remove packing material. User instructions MUST be given to the **OWNER**. Hardware supplied with the unit, if required, will be used at installation. The basin will be supplied with a standard 4" inlet grommet (4.50" OD) for connecting the incoming sewer line. Appropriate inlet piping must be used. The basin may not be dropped, rolled or laid on its side for any reason.

Installation shall be accomplished so that 1 inch to 4 inches of accessway, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the excavated hole must be large enough to allow for the concrete anchor.

A 6" inch (minimum) layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than 1/8" or more than 3/4" shall be used as bedding material under each unit.

A concrete anti-flotation collar, as detailed on the drawings, and sized according to the manufacturer’s instructions, shall be required and shall be pre-cast to the grinder pump or poured in place. Each grinder pump station with its pre-cast anti-flotation collar shall have a minimum of three lifting eyes for loading and unloading purposes.

If the concrete is poured in place, the unit shall be leveled, and filled with water, to the bottom of the inlet, to help prevent the unit from shifting while the concrete is being poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a level higher than the inlet piping, an 8" sleeve is required over the inlet prior to the concrete being poured.

The **CONTRACTOR** will provide and install a 4-foot piece of 4-inch SCH 40 PVC pipe with water tight cap, to stub-out the inlet for the property owners' installation contractor, as depicted on the contract drawings.

E/One requires that an E/One Uni-Lateral assembly (E/One part number NB0184PXX or NC0193GXX) or E/One Redundant Check Valve (E/One part number PC0051GXX) be installed in the pipe lateral outside the home between the pump discharge and the street main on all installations.

The electrical enclosure shall be furnished, installed and wired to the grinder pump station by the **CONTRACTOR**. An alarm device is required on every installation, there shall be **NO EXCEPTIONS**. It will be the responsibility of the **CONTRACTOR** and the **ENGINEER** to coordinate with the individual property owner(s) to determine the optimum location for the Alarm Panel.

The **CONTRACTOR** shall mount the alarm device in a conspicuous location, as per national and local codes. The alarm panel will be connected to the grinder pump station by a length of 6-conductor type TC cable as shown on the contract drawings. The power and alarm circuits must be on separate power circuits. The grinder pump stations will be provided with 32 feet, 25 feet of useable, electrical supply cable to connect the station to the alarm panel. This cable shall be supplied with a **FACTORY INSTALLED** EQD half to connect to the mating EQD half on the core.

3.05 BACKFILL REQUIREMENTS: Proper backfill is essential to the long-term reliability of any underground structure. Several methods of backfill are available to produce favorable results with different native soil conditions. The most highly recommended method of backfilling is to surround the unit to grade using Class I or Class II backfill material as defined in ASTM 2321. Class 1A and Class 1B are recommended where frost heave is a concern, Class 1B is a better choice when the native soil is sand or if a high, fluctuating water table is expected. Class 1, angular crushed stone offers an added benefit in that it doesn't need to be compacted.

Class II, naturally rounded stone, may require more compactive effort, or tamping, to achieve the proper density. If the native soil condition consists of clean compactible soil, with less than 12 percent fines, free of ice, rocks, roots and organic material, it may be an acceptable backfill. Soil must be compacted in lifts not to exceed one foot to reach a final Proctor Density of between 85 percent and 90 percent. Heavy, non-compactible clays and silts are *not* suitable backfill for this or any underground structure such as inlet or discharge lines.

If you are unsure of the consistency of the native soil, it is recommended that a geotechnical evaluation of the material is obtained before specifying backfill.

Another option is the use of a flowable fill (i.e., low slump concrete). This is particularly attractive when installing grinder pump stations in augured holes where tight clearances make it difficult to assure proper backfilling and compaction with dry materials. Flowable fills should not be dropped more than 4 feet from the discharge to the bottom of the hole to avoid separation of the constituent materials.

Backfill of clean native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in lifts not exceeding 12" to a final Proctor Density of not less than 85 percent. Improper backfilling may result in damaged accessways. The grinder pump station shall be installed at a minimum depth from grade to the top of the 1 1/4" discharge line, to assure maximum frost protection. The finish grade line shall be 1" to 4" below the bottom of the lid, and final grade shall slope away from the grinder pump station.

All restoration will be the responsibility of the **CONTRACTOR**. Per unit costs for this item shall be included in the **CONTRACTOR'S** bid price for the individual grinder pump stations. The properties shall be restored to their original condition in all respects, including, but not limited to, curb and sidewalk replacement, landscaping, loaming and seeding, and restoration of the traveled ways, as directed by the **ENGINEER**.

3.06 START-UP AND FIELD TESTING: The **MANUFACTURER** shall provide the services of qualified factory trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the **OWNER'S** personnel in the operation and maintenance of the equipment before the stations are accepted by the **OWNER**.

All equipment and materials necessary to perform testing shall be the responsibility of the **INSTALLING CONTRACTOR.** This includes, as a minimum, a portable generator and power cable (if temporary power is required), water in each basin (filled to a depth sufficient to verify the high level alarm is operating), and opening of all valves in the system. These steps shall be completed prior to the qualified factory trained technician(s) arrival on site.

The services of a trained factory-authorized technician shall be provided at a rate of 40 hours for every 100 grinder pump stations supplied.

Upon completion of the installation, the authorized factory technician(s) will perform the following test on each station:

1. Make certain the discharge shut-off valve in the station is fully open.

2. Turn ON the alarm power circuit and verify the alarm is functioning properly.

3. Turn ON the pump power circuit. Initiate the pump operation to verify automatic "on/off" controls are operative. The pump should immediately turn ON.

4. Consult the Manufacturer's Service Manual for detailed start-up procedures.

Upon completion of the start-up and testing, the **MANUFACTURER** shall submit to the **ENGINEER** the start-up authorization form describing the results of the tests performed for each grinder pump station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed and any installation deficiencies corrected.

4.0 OPERATION AND MAINTENANCE

4.01 SPARE CORE: The **MANUFACTURER** will supply one spare grinder pump core for every 50 grinder pump stations installed, complete with all operational controls, level sensors, check valve, anti-siphon valve, pump/motor unit, and grinder.

4.02 MANUALS: The **MANUFACTURER** shall supply four copies of Operation and Maintenance Manuals to the **OWNER**, and one copy of the same to the **ENGINEER.**

END OF SECTION

WARRANTY PERFORMANCE CERTIFICATION

As a pre-bid certification requirement, each bidder shall provide a Warranty Performance Certification executed by the most senior executive officer, which certifies a minimum of a two (2) year warranty. They must further detail any exclusions from the warranty or additional cost items required to maintain the equipment in warrantable condition, including all associated labor and shipping fees, and certify that the manufacturer will bear **all** costs to correct original equipment deficiency for the effective period of the warranty. "In lieu of the above warranty, a no-charge, 5 Year Certified Simplex Station Warranty with the same coverage as E/One's Standard Warranty will be granted if the Simplex Installation utilizes; a Protect Plus Panel, the E/One online Certified Installation and Start-Up E/Cert System and an E/One Stainless Steel Curb Stop Assembly."

I,_____, by and through my duly authorized signature below as its most senior operating executive, certify that _____ _____ will provide a two (2) year warranty on grinder pump equipment manufactured and supplied by _____ _____ for the _____ _____ project. I further certify that, other than failure to install equipment in accordance with manufacturer's instructions, no exclusions and/or cost items to maintain said equipment in warrantable condition, including labor, travel and shipping fees, exist except as detailed immediately below:

EXCLUSIONS: 1. _____
2. _____
3. _____

COST ITEMS TO MAINTAIN EQUIPMENT IN WARRANTABLE CONDITION:	Required Frequency (mos)	Avg. monthly cost ($) times warranty period
1. _____	_____	$ _____
2. _____	_____	$ _____
3. _____	_____	$ _____
4. _____	_____	$ _____
5. _____	_____	$ _____

Total labor/material cost to maintain equipment in warrantable condition for warranty period ($):

For any items not identified as exclusions or additional cost items above, OR for additional labor & material costs required to maintain equipment in warrantable condition that exceed the Avg. monthly cost ($) detailed above, _____ will bear all costs to correct such original equipment deficiency for the effective period of the warranty including all applicable labor, travel and shipping fees.

_____ _____
Signature Date

_____
Title

MANUFACTURER'S DISCLOSURE STATEMENT

Note: To be completed if proposing an alternate

1.0 GENERAL:

1.01 General Description
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____
_____
_____
_____

1.04 Experience
List 10 low pressure sewer system installations ***of the type of pump/station specified (progressive cavity type)*** that have been in operation for a period of no less than ten years with a minimum of 100 pumps pumping into a "common" low pressure sewer system. Provide Name and Location, Contact Name, Phone Number, Number of Pumps, and Install Date for each.
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

1.05 Operating Conditions
Describe all non-conforming aspects to the specification:
_____
_____
_____

1.06 Warranty
Fully state the manufacturer's warranty:
_____
_____
_____
_____
_____
_____

2.0 PRODUCT:

2.01 Pump
Describe all non-conforming aspects to the specification:
_____
_____
_____

2.02 Grinder
Describe all non-conforming aspects to the specification:
_____
_____

_____
_____

2.03 Motor
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.05 Tank
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.07 Electrical Quick Disconnect
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.08 Check Valve
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.09 Anti-Siphon Valve
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.11 Controls
Describe all non-conforming aspects to the specification:
_____
_____
_____
_____

2.16 Safety
Describe all non-conforming aspects to the specification:
_____
_____
_____

3.0 EXECUTION:

3.01 Factory Test
Describe all non-conforming aspects to the specification:
_____
_____

_____
_____

I attest that all questions are answered truthfully and all non-conforming aspects to the specifications have been described where requested.

Manufacturer: _____

By: _____ _____ Date: _____
Name of Corporate Officer Signature

_____
Title of Corporate Officer

Witness: _____ _____ Date: _____
Name Signature

Environment One Corporation
2773 Balltown Road
Niskayuna, New York 12309
www.eone.com
A PCC Company

E/ONE EXTREME SERIES

5-Year Limited Warranty with Certified Installation

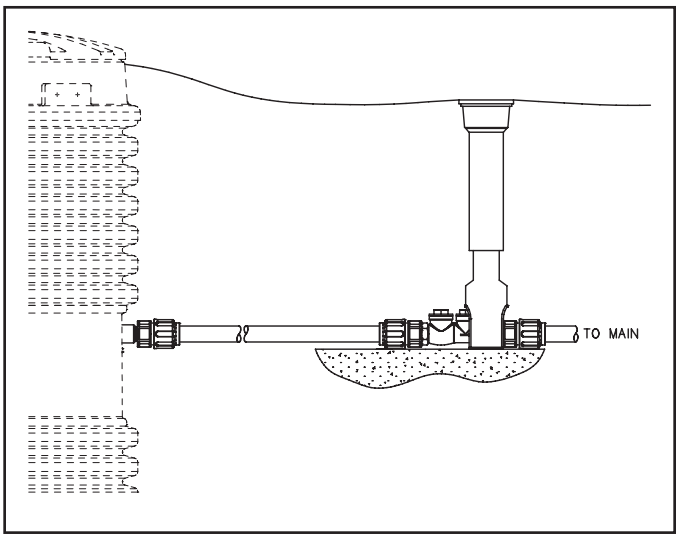
Proper installation is key to a trouble-free experience with your E/One grinder pump station. Environment One, the industry leader of residential grinder pumps, is pleased to offer a Certified Installation Program with five years of coverage, the first of its kind in the industry.

The Certified Installation program is available for new, residential installations of simplex Extreme D-Series and W-Series grinder pump stations with hardwired level sensing controls (DH071, DH151, WH101, WH231). The stainless steel Uni-Lateral and an E/One Sentry Protect Plus alarm panel must also be purchased and installed. Finally, complete and submit the checklists (below) to obtain the warranty certificate.

5-Year Limited Warranty with Certified Installation for new simplex D-Series and W-Series stations

REQUIREMENTS FOR CERTIFIED INSTALLATION

1. Proper installation of E/One's Uni-Lateral
2. Proper installation of an E/One Sentry Protect Plus alarm panel
3. Completion of an approved Installation Checklist at apps.eone.com
4. Completion of an approved Startup Checklist at apps.eone.com



The Uni-Lateral is a one-piece valve that can be installed between any grinder pump and the sewer main.

e/one SEWER SYSTEMS

5-Year Limited Warranty with Certified Installation

How to qualify for the Certified Installation warranty for DH071, DH151, WH101 and WH231 grinder pump stations:

1. Properly install E/One's Uni-Lateral.

2. Properly install E/One's Sentry Protect Plus alarm panel.

3. Complete the Installation Checklist at apps.eone.com.

4. Complete the Startup Checklist at apps.eone.com.

Upon approval of the submitted checklists, the owner of the grinder pump station(s) will receive a separate certificate that serves as validation of the Certified Installation warranty. **If no certificate is issued, the warranty is not active.**

TERMS AND CONDITIONS

This new, limited warranty guarantees its product (models DH071, DH151, WH101, WH231) to be free from defects in material and factory workmanship for a period of FIVE years from the date of installation, or 63 months from the date of shipment from the factory, whichever occurs first, provided the product is properly installed per the Certified Installation criteria, serviced and operated under normal conditions and according to manufacturer's instructions. Repair or parts replacement required as a result of such defect will be made free of charge during this period upon return of the defective parts or equipment to the manufacturer or its nearest authorized service center.

SEWER SYSTEMS

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