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Engineer's Report
Chai Builders
248 Tioronda Avenue

Tioronda Avenue, Beacon
Dutchess County, New York

Issued: December 20, 2019

Prepared for:
Chai Builders

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Chazen Project No. 81750.00

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TABLE OF CONTENTS

APPENDICES

1.0 PROJECT DESCRIPTION

The applicant, Chai Builders, is proposing the redevelopment of the former Tuck Industries site located on Tioronda Avenue in the City of Beacon (Tax Map Number: 5954-16-993482). The proposed site includes a multi-discipline use of a multifamily residential development and a non-residential commercial building with associated parking. A greenway trail for public use is also proposed along the Fishkill Creek.

The project is situated in the Fishkill Creek Development (FCD) District as designated by the City of Beacon zoning regulations. According to Article IV-C, *Fishkill Creek Development (FCD) District*, the purposes of the FCD District include the encouragement of redevelopment of underutilized industrial properties along the Fishkill Creek in a manner that provides a mix of residential and non-residential uses. Principal uses permitted in the FCD District by special permit include "attached apartment and multifamily dwellings" [Section 223-41.13(B)(1)]. According to Section 223-41.13(D), each FCD proposal requires concept plan approval and special permit approval by the Beacon City Council and site plan approval by the Beacon Planning Board. These reviews may proceed simultaneously.

The City of Beacon will permit the applicant to connect to the existing 8" water main that enters the property. The existing 8-inch main is owned by the City of Beacon and connects to a 12" water main along Tioronda Avenue. Each proposed building's service line shall also provide for its fire suppression system consisting of sprinklers to be located within each apartment unit. The fire suppression system shall be isolated from the domestic use by utilizing a backflow prevention device on the fire system that is acceptable to the Department of Health and shall be designed to the latest edition of the New York State Fire Code.

The site is situated below Tioronda Avenue and as such any sewage generated onsite would have to be pumped to enter the City of Beacon's sewer system. An existing 2" force main is present onsite for this purpose. It is proposed to reactivate this line to avoid a railroad crossing.

This report has been prepared to substantiate the design of the proposed water supply and wastewater system improvements. This report provides a description of the proposed improvements including design criteria and manufacturer's cut-sheets of the equipment selected.

2.0 ESTIMATED DOMESTIC WATER AND SEWER DEMANDS

Using water saving fixtures the estimated daily water demand is 110 gpd per bedroom. Each of the proposed apartments are either 1- or 2-bedroom units therefore each unit is anticipated to utilize 110 gpd or 220 gpd, respectively, of water on average. The site is also proposing a non-residential, commercial building with an estimated flow of 2,032 gpd after considering water saving fixtures. The proposed site therefore has an average daily demand of 12,592 gpd with a maximum day demand of 25,184 gpd (Peaking Factor of 2).

To be conservative, it shall be assumed that the average daily sewer demand equals the average daily water demand of 12,592 gpd (8.74 gpm).

The proposed site consists of two 32-unit buildings and one 25,400 SF commercial building. Peak hourly sewer demand for each building utilizes a peaking factor of 4 based on the equation found in the latest edition of the Ten State Standards using a population of 200. Expected demands from each building is therefore calculated as follows:

Building Type	Formula	# of Units	Average Daily Flow (gpd)	Average Daily Flow (gpm)	Max Day Flow (gpm) (peaking factor 2)	Peak Flow (gpm) (peaking factor 4)
Residential	110 gpd/bedroom	32	3,520	2.44	4.89	9.78
	220 gpd/bedroom	32	7,040	4.89	9.78	19.56
Commercial	(BLDG SF)(0.1 gpd/SF)(80%)	25,400 SF	2,032	1.41	2.82	5.64
		Total Flow	12,592	8.74	17.49	34.98
				Average Flow (gpd)	Max Day Flow (gpd)	Peak Flow (gpd)
				4972	9944	19888

3.0 DESCRIPTION OF PROPOSED IMPROVEMENTS

3.1 Water System

The three existing service lines that serve the property currently combine to form a loop at or near the property line. The center service line contains a valve pit residing in the Metro-Transit Authority (MTA) Right-of-Way that is proposed to be removed and replaced with an 8" line, reconnecting to the tee that currently is buried just beyond the valve pit. It is then proposed to install an additional 8" tee with a gate valve that will then enter and serve the site, providing one water line entering the property. This proposed line shall then enter a proposed meter pit prior to the proposed distribution system, complete with hydrants, building services, and valves. A fire meter is proposed to be installed in the meter pit with sufficient straight run of pipe for maximum accuracy. The proposed unit has a low flow capability of 2.5 gpm and a high flow capability felt to be capable to handle fire flows. Each proposed apartment unit is to have a water meter for billing purposes as well as the commercial building. Leak detection is anticipated to be performed by evaluating the fire flow meter against the total of the individual meters. All meters shall be equipped with an automatic reading system compatible to the City of Beacon's system. At present the City of Beacon standardizes around the manufacturer Sensus for water meters and these meters are typically provided by the City once paid for by the Owner of the property. Cutsheets of the anticipated fire meter and apartment meters are included in Appendix B.

Chazen performed a hydrant flow test on September 22, 2014 with assistance from the City of Beacon Water Department. The static pressure at the hydrant across the street from the site was 100 psi. A flow rate of 1,500 gpm was achieved through the hydrant connected to the 12" line, with an operating pressure of 98 psi at that flow. The City has adequate supply and pressure for this site for both domestic and fire flow services. The service line sizes to the buildings also take into account reasonable estimate of instantaneous flows as a result of sprinkler activation, and the loss of pressure resulting from those flows during such a catastrophic event to ensure sufficient flow. Sufficient water is available to the site to accommodate peaking factors greater than what has been used for this project.

The system is proposed to have a pressure reducing valve installed on the main service feeding the site. This device is designed to maintain a constant downstream pressure to the site at varying pressure upstream. New York State Plumbing Code allows a maximum of 80 psi inside of buildings. To comply with this, the outlet of the valve shall be set to provide a 65-psi maximum downstream pressure. No power is needed for the valve to operate.

A double check valve or other suitable device is proposed to be installed in each building's service line inside the building to isolate the fire protection line from the potable line in accordance with New York State Department of Health (NYSDOH) standards. The make and model of the valve shall be on the list of Approved Backflow Prevention Assemblies generated by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR). The NYSDOH uses the FCCCHR as a basis for their approval of such devices.

Water mains will be installed with a minimum of 5' of cover and be sized to accommodate the domestic and sprinkler system demands. Hydrants and valves are to be installed for isolation and firefighting/flushing purposes respectively.

It is anticipated that the distribution systems in each building shall be designed according to the most recent edition of the New York State Plumbing Code, with input from the City of Beacon Fire Department for any additional firefighting measures that may be required. At minimum a check valve is proposed to be placed at the beginning of each main sprinkler head service line.

3.2 Sewer System

Chazen performed a dye test on the existing force main on September 17, 2014. A 60-psi pump was utilized to convey water with a Fluorescein dye added in order to ascertain that the existing force main was still connected to the City of Beacon sewer system. No dye was observed during or after the test to appear anywhere except in the existing collection system, indicating that the main is likely undamaged. The 60-psi pressure is 2-3 times the operating pressure of the proposed system and as such the existing main is felt able to be utilized under normal operation. To help ensure the integrity of the FRP force main, it is proposed to extend the steel encasement to cover the entire length of the FRP pipe on the 248 Tioronda property. The original agreement allowing for the construction and maintenance of the line, dated 30 June 1980, is included in Appendix C.

This system utilizes a submersible grinder pump that connects to a PVC force main. The PVC force main is proposed to be 2" and this shall connect to the existing 2" fiberglass reinforced polymer (FRP) line. A 250-psi pressure-rated Teekay stepped coupling type II with NBR gaskets will be provided to connect the PVC forcemain to the existing FRP forcemain. Cut-sheets of the transition coupling are provided in Appendix C.

This allows for a majority of the proposed sewer system to be buried closer to the typical minimum of 4.5' of cover. Although the pump station appears to require a bury depth approaching 19', the station is located in an area that is proposed to be fill to that depth, requiring minimal additional costs to install. The pump station shall be manufactured by PumpMate, made of reinforced concrete case with fiberglass coating structural steel base with aluminum access door and insulated fiberglass housing. The station is proposed to have a PumpMate cover that will allow above grade valves and control stations making it easy to maintain.

The pump has a 5 HP and capable of conveying approximately 67 gpm at the estimated normal system pressure of 31 psi. System curves for the pump stations are included in Appendix C.

The service life of the Sulzer pump is estimated at 25 years according to the manufacturer.

In general, the pump station is designed as follows:

- Duplex Stations - These contain two (2) pumps that are set at the same elevation and controlled by a duplex pump controller. Should the high-level alarm float be tripped, both pumps are called to activate.

The following features are common to the proposed pump station:

- The sanitary pump station will be a duplex underground pump station equipped with explosion proof submersible sewage pumps each designed to handle the peak design flow in a 5-foot diameter pre-cast reinforced concrete wet well chamber including control panel, level switches (low, pumps off, lead on, lag on and high); lead and lag pumps will operate alternatively;

- The sanitary pump station will be provided with a lockable aluminum access door and handle, a confined space warning plate, a guide rail system for pumps, a lifting chain, manhole steps, a gravity vent pipe, check valve, gate valve, pipe supports, discharge pipe and manifold, a tripod and electrical winch for pump removal and all accessories;

- The sanitary pump station will be provided with main electric/telephone service, control panels and telemetry system.

The calculations in Appendix C show the expected velocities are high enough to help prevent any buildup within the lines over time. The pump's cycle time will vary dependent on the flows. The calculations in Appendix C show various scenarios, including worst case scenarios with one pump out of service. With one pump online, the velocity on the 2.0" lateral is 7.0 fps. It is not expected that one pump would be operational within the system for long. Assuming one pump in the station is out of service the station capacity is 67.2 gpm.

The flow is above the peak flow listed earlier in this report and reflect a conservative design approach. Velocities are maintained above 2 fps in all cases.

Head loss calculations for the pump station running concurrently during normal operation have been provided in Appendix B to simulate a worst-case pumping scenario. Under this scenario, calculations revealed that the output of the pump station exceeds the anticipated peak flows.

Also in Appendix C is a letter from the Dutchess County Department of Health regarding their conditional approval on the old proposed sewer connection. Based on that letter the City of Beacon had no objections to the old proposed sewer connection. It should be known that there are no changes from the old proposed sewer connection and now.

A dedicated on-site standby emergency generator will provide backup power to the pump station. The emergency generator will be sized to start and operate the pump station simultaneously during a power

outage. The generator will be equipped with an automatic transfer switch to ensure continuous operation of the pump station in the event of a power outage.

A 25 kW Generac model QT025A natural gas engine generator is proposed to be provided. The generator will be housed in a sound attenuated acoustically designed weather protective enclosure with low noise critical grade exhaust silencer. The unit will have the following features: run-off-auto switch, running time meter, critical-grade exhaust silencer, automatic transfer switch, automatic battery charger, generator alarm status panel, oil pressure gauge, high temperature and low oil pressure shutdown.

Cut-sheets of the Generac model QT025A emergency generator are provided in Appendix B.

4.0 TESTING AND DISINFECTION

Upon substantial completion of all underground water pipes, or at times when it is prudent to conduct performance testing, all pipes shall be pressure tested and leakage tested in accordance with AWWA Standard C600 *"Standard for Installation of Ductile-Iron Water Mains and their Appurtenances"* and/or AWWA Standard C605 "*Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water*" (latest edition).

All new water mains shall be disinfected in accordance with AWWA Standard C651 *"Standard for Disinfection of Water Mains"* (latest edition).

All indoor plumbing and equipment shall be disinfected as per applicable NYS Plumbing Code and City of Beacon code.

Sewer force main piping shall be tested for leakage in accordance with notes on the sewer detail sheet (C570). Gravity sewer lines will be tested in accordance with notes on the sewer detail sheet (C570).

5.0 STANDARDS

The design, construction and installation shall be in accordance with this report and associated plans and generally accepted standards in effect at the time of construction which include:

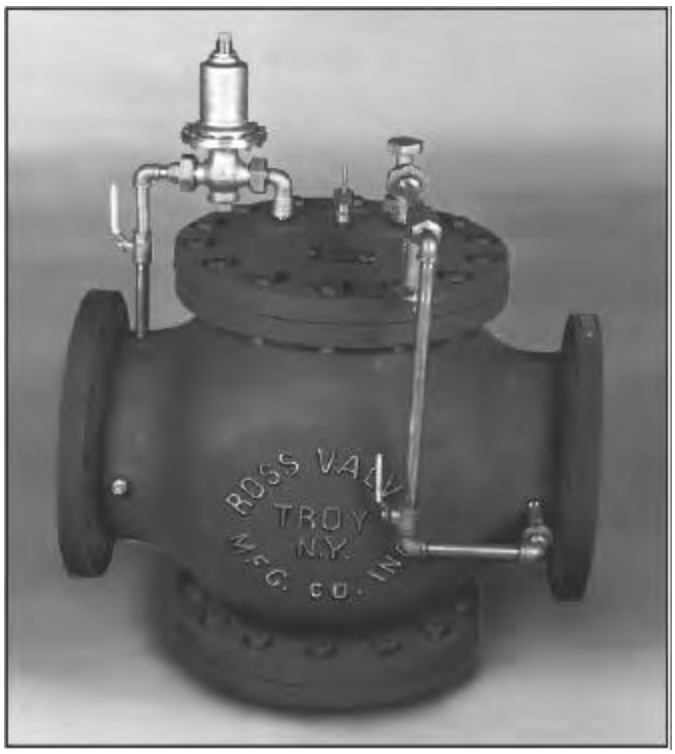
- "Recommended Standards for Water Works (Ten States)"
- "New York State Department of Health and Dutchess County Department of Health policies, procedures and standards."
- "Dutchess County Department of Health Sanitary Code, Article XI and Article V."
- "Dutchess County Department of Health Certificate of Approval letter."
- The installation of the public water supply system shall be in conformance with the National Electric Code (NEC).
- "New York State Department of Environmental Conservation, 2014"
- Recommended Standards for Waste Water (Ten States)"

Appendix A:
Water Equipment Cut Sheets

PRESSURE REDUCING VALVE

Purpose: Control outlet pressure **Model Number: 40WR**

Sizes: 4" - 48"
Type: Throttling
Primarily Controlled By:
Hydraulic pressure
Located: In line
Purpose: To prevent outlet pressure from exceeding a preset maximum level
Inlet Pressure: Maximum: 300 psi
Inlet Pressure: Minimum: 5 psi
Construction: Body: 4" - 36" - Cast iron (semi-steel) with bronze trim
40" - 48" - Ductile iron, with bronze/ stainless steel trim
Control Devices:
Strainer: Model 5F-2
Valves:
Needle
Pilot: Pressure Reducing: Model 40WR With internal sensing port or equipped to receive a separate sensing line.



Customized Features

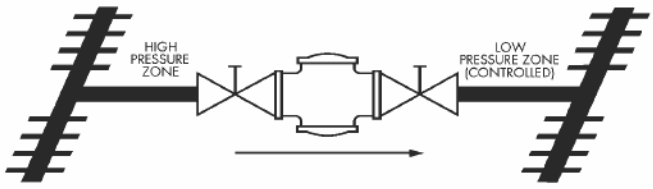
Any one or a selection of features can be added to the basic pressure reducing valve.

Code

- **ACAV** - Anti-cavitation Trim
- **CI** - Check Feature (Internal)
- **CE** - Check Feature (Cushioned)
- **R** - Reverse Flow Feature
- **PR** - Dual Pilot: Second Pressure Reducing Pilot Valve
- **BP** - Back Pressure Sustaining Pilot Valve
- **SC** or **SO** - Solenoid Pilot Valve: 2 Way
- **SG** or **SF** - Solenoid Pilot Valve: 3 Way
- **M** - Reversible Electric Motor
- **ES** - Higher Efficiency Strainer
- **LS** - Limit Switch
- **SS** - Stainless Steel Trim

Basic Application

Control systems where the supply (inlet) pressure is higher than the discharge pressure.



If: Supply pressure is higher than user capacity
Ross Main Valve will: Throttle to pass only enough water to the user to maintain a preset lower pressure.

OMNI™ F²

4”, 6”, 8” and 10” OMNI F² Meter

Description

4”, 6”, 8” and 10” Sizes

The OMNI F² meter operation is based on advanced Floating Ball Technology (FBT).

AMR/AMI Mode | Totalization Mode | Resettable Test Mode

Features

CONFORMANCE TO STANDARDS

The OMNI F² meter meets and far exceeds the most recent revision of AWWA Standard C703 class II. Additionally, the meter does not require a valve to meet these standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved. The OMNI F² meter is UL (Underwriters Laboratories) Listed and FM (Factory Mutual) approved for use on fire protection and domestic water applications.

PERFORMANCE

The patented measurement principles of the OMNI F² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The F² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without undue wear or accuracy degradation.

CONSTRUCTION

The OMNI F² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the “floating ball” impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable measuring chamber, unique chamber seal to the maincase using a high pressure o-ring, testing port and a convenient integral strainer with optional drain/debris-flushing ports.

OMNI ELECTRONIC REGISTER

The OMNI F² electronic register is hermetically sealed with electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with the UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the “floating ball” impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydro dynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without friction or wear, thus creating the extended upper and lower flow ranges capable on only the OMNI F² meter.

STRAINER

The OMNI F² meter includes the Sensus designed “V” shaped UL Listed/FM approved strainer which utilizes a stainless steel screen along with Floating Ball Technology (FBT) to create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance. Optional drain ports, located at the back lower corners of the strainer body, allow for easy discharging of debris without the need to remove the cover.

MAINTENANCE

The OMNI F² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and/or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers are available for the OMNI F² meters.

AMR / AMI SYSTEMS

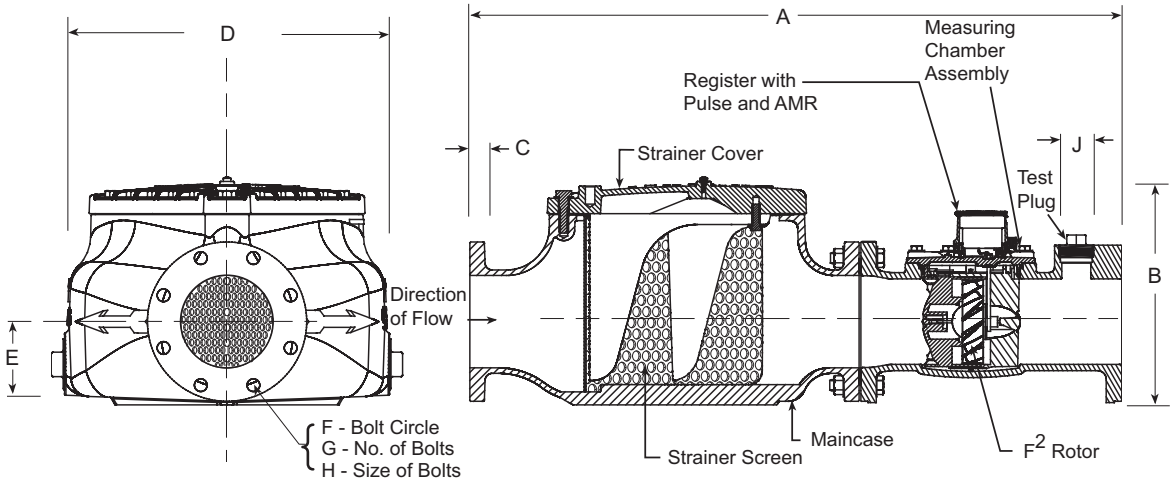
Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE

Sensus OMNI F² Meters are backed by “The Sensus Guarantee.” Ask your Sensus representative for details or see Bulletin G-500.

sensus

OMNI F²: 4", 6", 8" and 10"



DIMENSIONS AND NET WEIGHTS

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight	Standard Fireline
4" DN 100mm	1.5 gpm .34 m³/hr	1000 gpm 227 m³/hr	Flanged	33" 838mm	13-11/16" 348mm	15/16" 24mm	17-1/2" 446mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	2" 50mm	212 lbs. 96 kg.	252 lbs. 115 kg.	51-7/8" (1317mm)
6" DN 150mm	3.0 gpm .681 m³/hr	2000 gpm 454 m³/hr	Flanged	45" 1143mm	15-3/4" 400mm	15/16" 24mm	22-3/8" 569mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	2" 50mm	394 lbs. 179 kg.	449 lbs. 204 kg.	67-5/8" (1717mm)
8" DN 200mm	4 gpm .91 m³/hr	3500 gpm 795 m³/hr	Flanged	53" 1346mm	18-1/2" 470mm	11/16" 17mm	31" 787mm	6-3/4" 172mm	11-3/4" 298mm	8	3/4" 19mm	2" NPT	736 lbs. 334 kg.	786 lbs. 357 kg.	77" (1956mm)
10" DN 250mm	5 gpm 1.1 m³/hr	5500 gpm 1249 m³/hr	Flanged	68" 1727mm	22-1/4" 565mm	11/16" 17mm	37-1/3" 947mm	8-1/2" 216mm	14-1/4" 362mm	12	7/8 22mm	2" NPT	1155 lbs. 524 kg.	1215 lbs. 551 kg.	90" (2286mm)

[1] **Standard Fireline lay length with optional spool piece added.**

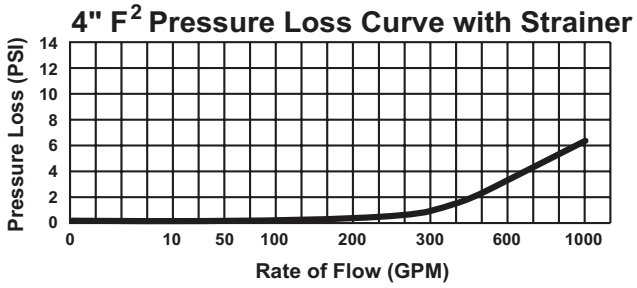
SPECIFICATIONS

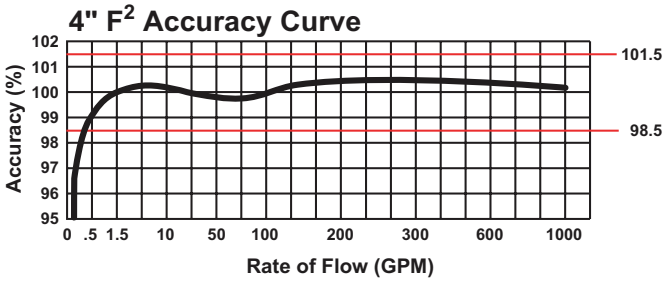
SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 ºF (56 ºC) - 150 ºF (65.6 ºC)
OPERATING RANGE (100% ± 1.5%)	4": 1.5 – 1000 GPM (.34 - 227 m³/hr) 6": 3.0 – 2000 GPM (.34 - 227 m³/hr) 8": 4– 3500 GPM (0.91-795 m³/hr) 10": 5– 5500 GPM (1.1-1249 m³/hr)
LOW FLOW (95% – 101.5%)	4": .75 GPM (.06 m³/hr) 6": 1.5 GPM (.06 m³/hr) 8": 2.5 GPM (0.57 m³/hr) 10": 3.5 GPM (0.8 m³/hr)
UL MINIMUM FLOW	8": 97% @ 3 GPM (0.68 m³/hr) 10": 97% @ 4 GPM (0.9 m³/hr)
MAXIMUM CONTINUOUS OPERATION	4": 1000 GPM (227 m³/hr) 6": 2000 GPM (454 m³/hr) 8": 3500 GPM (795 m³/hr) 10": 5500 GPM (1249 m³/hr)
MAXIMUM INTERMITTENT OPERATION	4": 1250 GPM (284 m³/hr) 6": 2500 GPM (568 m³/hr) 8": 4700 GPM (1067 m³/hr) 10": 7000 GPM (1590 m³/hr)

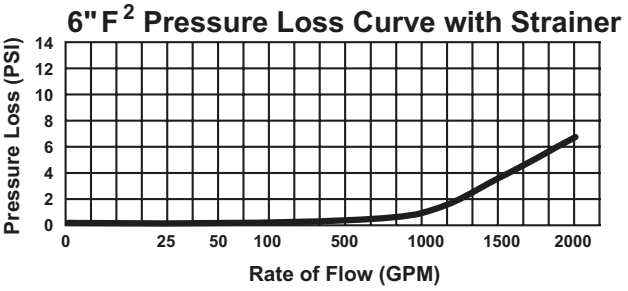
PRESSURE LOSS	4": 6.4 psi @ 1000 GPM (.60 bar @ 227 m³/hr) 6": 6.7 psi @ 2000 GPM (.56 bar @ 454 m³/hr) 8": 5 psi @ 3500 GPM (.34 bar @ 795 m³/hr) 10": 7 psi @ 5500 GPM (.48 bar @ 1249 m³/hr)
MAXIMUM OPERATING PRESSURE	175 PSI (12 bar)
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Ft./ Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life
NSF APPROVED MATERIALS	**Maincase:** Coated Ductile Iron **Measuring Chamber:** Thermoplastic **Rotor "Floating Ball":** Thermoplastic **Radial Bearings:** Hybrid Thermoplastic **Thrust Bearings:** Sapphire/Ceramic Jewel **Magnets:** Ceramic Magnet **Strainer Screen:** Stainless Steel **Strainer Cover:** Coated Ductile Iron **Test Plug:** Coated Ductile Iron

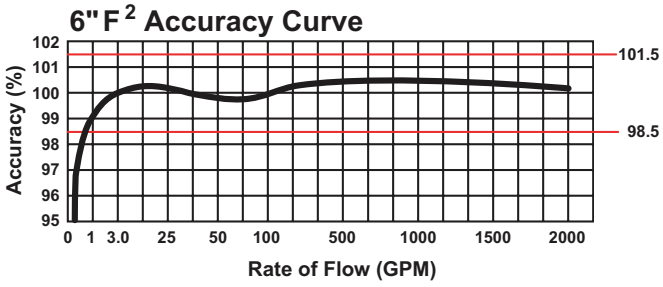
OMNI F²: 4”, 6”, 8” and 10”

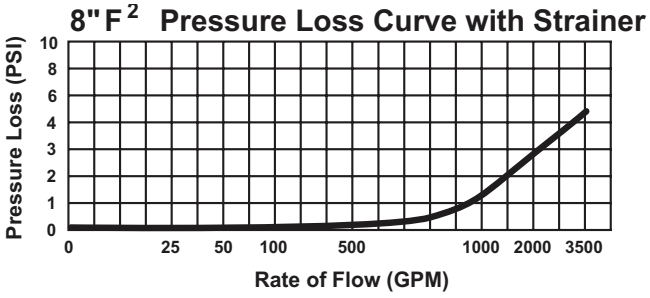
Headloss Curves

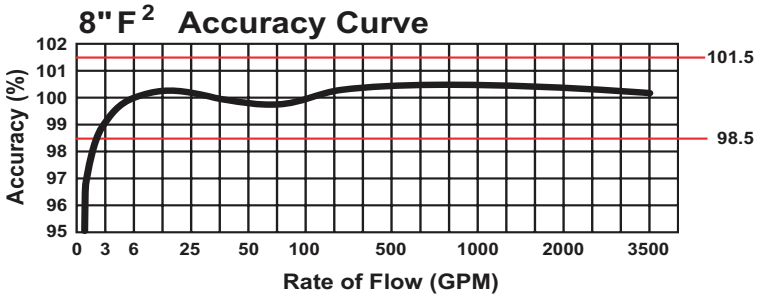


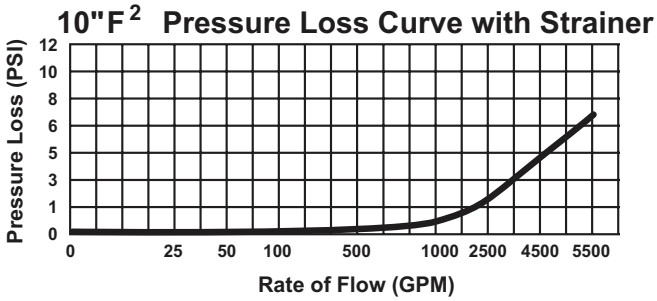


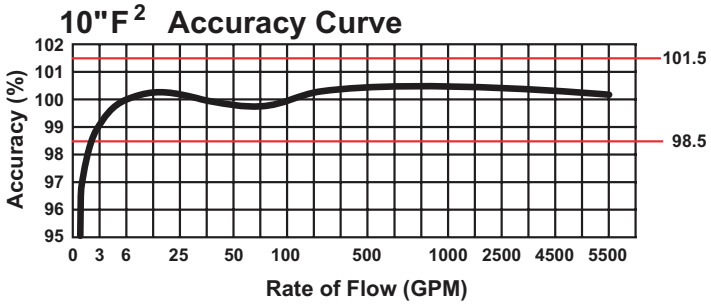












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1-800-638-3748
www.sensus.com/water

DS-W-SR2-00-00-0312-04-A

SR II® Low Lead Meters

Displacement Type Magnetic Drive Cold Water Meters

Description

5/8” (DN 15mm), 3/4” (DN 20mm) and 1” (DN 25mm) Sizes

Measurement of cold water where flow is in one direction only; in residential, commercial and industrial services.

Features

CONFORMANCE TO STANDARDS

Sensus SRII Low Lead Water Meters meet the requirements of NSF Standard 61, Annex F and G and comply with ANSI/AWWA Standard C700-latest revision. Each meter is tested to insure compliance with AWWA standards.

CONSTRUCTION

Sensus SR II Low Lead Water Meters consist of three basic components: maincase; measuring chamber; and sealed register. Maincases are made of Bismuth BiAlloy CDA89836 or EnviroBrass™ II C89520 with externally-threaded spuds. Registers are housed in a bonnet of synthetic polymer. Measuring chambers are of Rocksyn®, a corrosionresistant, tailored thermoplastic material formulated for long-term performance and especially suitable for aggressive water conditions. Maincase bottom plates are available in Bismuth BiAlloy, EnviroBrass II or, if frost protection is desired, in cast iron or synthetic polymer[1].

SEALED REGISTER

Hermetically sealed; proven magnetic drive design eliminates dirt and moisture contamination, tampering and lens fogging problems. Standard register includes a straight-reading, odometertype totalization display; a 360° test circle with center sweep hand; and a low flow (leak) detector. Gears are selflubricating, molded plastic for long life and minimum friction.

No change gears are required for accuracy calibration. Encodertype remote reading systems are available for all SR II Low Lead Water Meters. (See other side of sheet for additional information.)

TAMPERPROOF FEATURES

A unique locking system prevents customer removal of the register to obtain free water. The register can only be removed by breaking the register bonnet.

MAGNETIC DRIVE

The SR II Low Lead features a hydrodynamically cushioned design that eliminates premature wear of components. The meter utilizes a patented positive, reliable drive coupling. The highstrength magnets used will eliminate “drive slip” in normal use and also provide adequate strength to drive remote register units.

OPERATION

Water flows through the meter’s strainer and into the measuring chamber where it drives the piston. The hydrodynamically balanced piston oscillates around a central hub, guided by the division plate.

A drive magnet transmits the motion of the piston to a driven magnet located within the hermetically sealed register. The driven magnet is connected to the register gear train. It reduces the piston oscillations into volume totalization units displayed on the register dial face.

MAINTENANCE

Sensus SR II Low Lead Water Meters are engineered to provide long-term value and virtually maintenance-free operation. Simplicity of design allows interchangeability of parts of like-size meters, reduced parts inventory requirements, and ease of maintenance. The register can be removed without relieving the water pressure or removing the maincase from the installation.

CONNECTIONS

Tailpieces/Unions for installing the meters on a variety of pipe types and sizes are available.

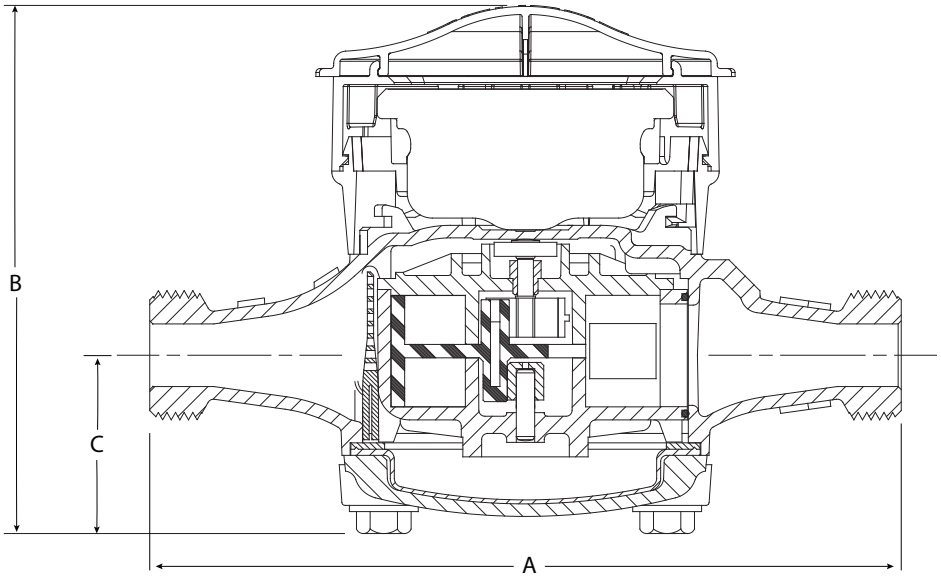
AMR / AMI SYSTEMS

Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE

Sensus SR II Water Meters are backed by “The Sensus Guarantee.” Ask your Sensus representative for details or see Bulletin G-500.

sensus



DIMENSIONS AND NET WEIGHTS

Meter Size	A	B	C	Width	Net Weight [1]
5/8" (DN 15mm)	7-1/2" (190mm)	5-3/8" (136mm)	1-3/4" (44mm)	3-7/8" (98mm)	4.3 lb. (1.97 kg)
5/8" x 3/4" (DN 15mm X 33mm)	7-1/2" (190mm)	5-3/8" (136mm)	1-3/4" (44mm)	3-7/8" (98mm)	4.4 lb. (2.00 kg)
3/4" (DN 20mm)	9" (229mm)	5-7/8" (149mm)	2-3/16" (56mm)	4-1/2" (114mm)	6.4 lb. (2.90 kg)
3/4" Short (DN 20mm)	7-1/2" (190mm)	5-7/8" (149mm)	2-3/16" (56mm)	4-1/2" (114mm)	6.2 lb. (2.81 kg)
1" (DN 25mm)	10-3/4" (273mm)	7-1/8" (181mm)	2-3/4" (70mm)	6-1/2" (165mm)	11.9 lb. (5.4 kg)

[1] With Rocksyn® measuring chamber.

SPECIFICATIONS

SERVICE	Measurement of potable and reclaim water.
NORMAL OPERATING FLOW RANGE [1] (100%±1.5%)	5/8" (DN 15mm) size: 1 to 20 gpm (0.25 to 4.5 m^3/hr) 3/4" (DN 20mm) size: 2 to 30 gpm (0.45 to 7.0 m^3/hr) 1" (DN 25mm) size: 3 to 50 gpm (0.7 to 11.0 m^3/hr)
LOW FLOW REGISTRATION (95% - 101.5%)	5/8" size: 1/4 gpm (0.06 m^3/hr) 3/4" size: 1/2 gpm (0.10 m^3/hr) 1" size: 3/4 gpm (0.15 m^3/hr)
MAXIMUM PRESSURE LOSS	5/8" size: 7.0 psi at 20 gpm (0.5 bar at 4.5 m^3/hr) 3/4" size: 9.0 psi at 30 gpm (0.6 bar at 7.0 m^3/hr) 1" size: 7.3 psi at 50 gpm (0.5 bar at 11.0 m^3/hr)
MAXIMUM OPERATING PRESSURE	150 psi (10.0 bar)
MEASURING ELEMENT	Oscillating piston
REGISTER [3]	Straight reading, hermetically sealed, magnetic drive. Remote reading unit optional.
STANDARD METER REGISTRATION [3]	10 gallons, 1 cubic foot, or 0.01 m^3/ or 0.1 m^3/sweep hand revolution. 10,000,000 gallons, 1,000,000 cubic feet or 100,000 m^3 capacity. 8 odometer wheels

METER CONNECTIONS [3]	5/8" (DN 15mm) size: 3/4" (26.44mm) threads 5/8" x 3/4" (DN 15mm x 33mm) size: 1" (33.25mm) threads 3/4" (DN 20mm) size: 1" (33.25mm) threads 1" (DN 25mm) size: 1-1/4" (41.9mm) threads (All threads are straight pipe, external type, conforming to ANSI B1.20.1 or ISO R228, if specified.)
MATERIALS	Maincase: Bismuth BiAlloy CDA89836 or EnviroBrass II C89520 Register box: Synthetic polymer Measuring chamber: Rocksyn® Bottom plate: Bismuth BiAlloy CDA89836 Magnets: Plasticized material Casing bolts: Stainless steel Strainer: Synthetic polymer

1 Maximum rates listed are for intermittent flow only. Maximum continuous flow rates as specified by AWWA are:
5/8" (DN 15mm)—10 gpm (2.3 m^3/hr)
3/4" (DN 20mm)—15 gpm (3.4 m^3/hr)
1" (DN 25mm)—25 gpm (5.7 m^3/hr)

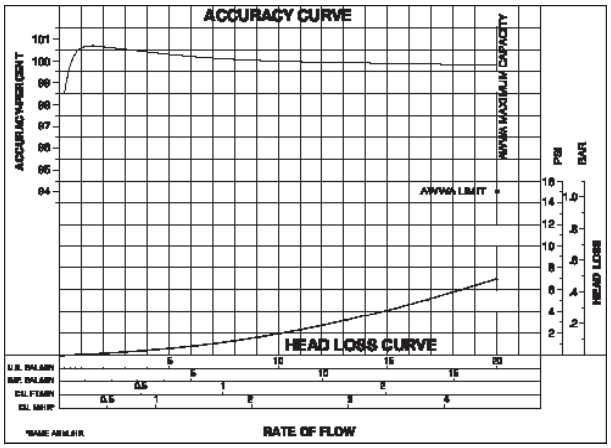
2 Unless otherwise noted, 5/8" size and 5/8" x 3/4" characteristics are identical. 5/8" x 3/4" designates 5/8" with 3/4" connection thread). Metric designation is the normal bore x the outside diameter.

3 See ICE-Opto Register Datasheet or Electronic Register Datasheet for details specifications.

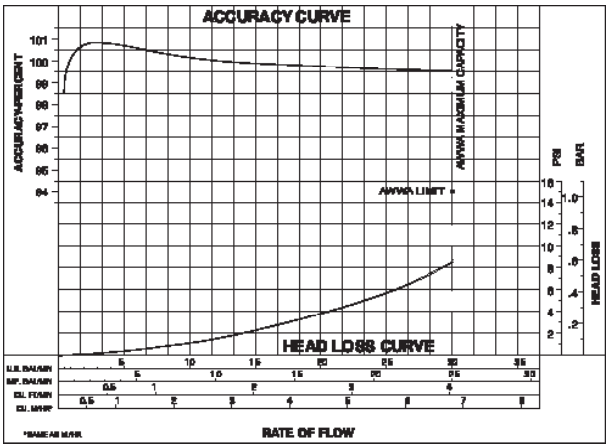
TYPICAL PERFORMANCE CURVES

SR II Meter

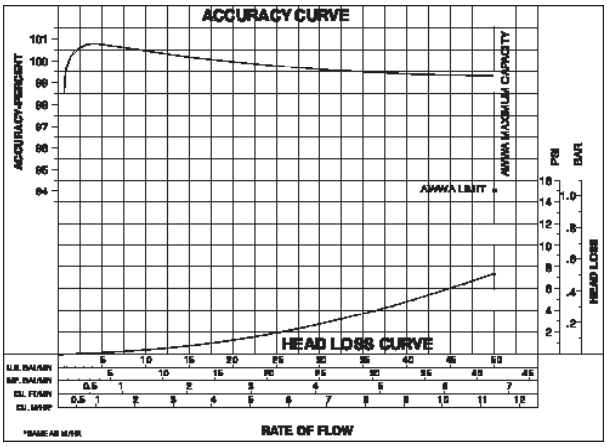
5/8” and 5/8” x 3/4” SR II Meter
UA-5833



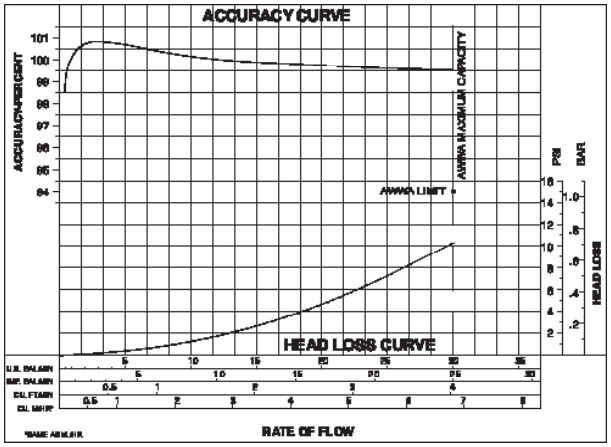
3/4” and 3/4” x 1” SR II Meter
UA-5834



1” SR II Meter
UA-5835



3/4” SR II Meter 7-1/2” Laying Length
UA-5838



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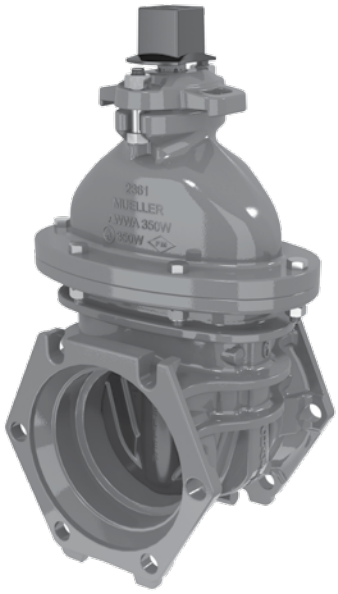
Raleigh, NC 27615
1-800-638-3748
www.sensus.com/water

4"- 12" A-2361 RESILIENT WEDGE GATE VALVES - M.J. x M.J.

Rev. 4-14

- Catalog number–
  A-2361-20 Mechanical joint ends (with accessories unassembled)
  A-2361-23 Mechanical joint ends (less accessories)
  A-2361-25 Mechanical joint ends (with transition gaskets accessories unassembled)
- Sizes – 4", 6", 8", 10", 12"
- Meets or exceeds all applicable requirements of ANSI/AWWA C515 Standard, UL Listed, FM Approved, and certified to ANSI/NSF 61.
- Standard mechanical joint ends comply with ANSI/AWWA C111
- Iron body with nominal 10 mils MUELLER® Pro-Gard® Fusion Epoxy Coated interior and exterior surfaces
- Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard.
- Iron wedge, symmetrical & fully encapsulated with molded rubber; no exposed iron
- Non-rising stem (NRS)
- Triple O-ring seal stuffing box (2 upper & 1 lower O-rings) with fourth o-ring serving as dirt seal
- 2" square wrench nut (optional handwheel available)–-open left or open right
- 350 psig (2400 kPa/24 barg) maximum working pressure, 700 psig (4800 kPa/48 barg) static test pressure
- UL Listed, FM Approved: 350 psig (2400 kPa/24 barg)
- Mueller valves are designed for potable water application



A-2361-20

Options

See page 10.46 for more information on Resilient Wedge Gate Valve options

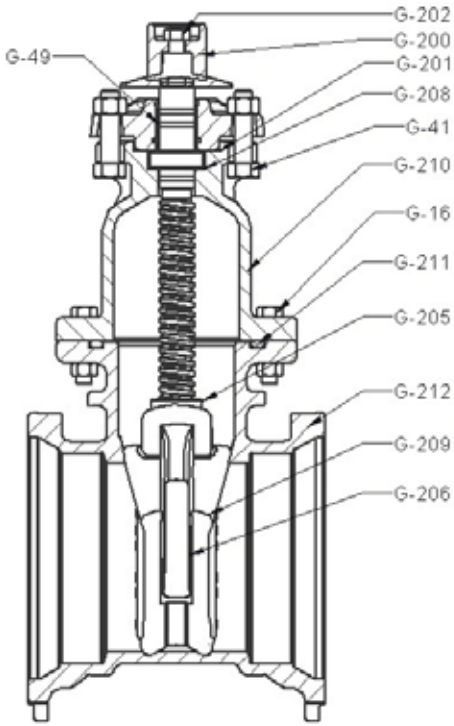
- Position indicators
- Stainless steel fasteners: Type 316
- Stainless steel stem: Type 304, Type 316
- ASTM B98-C66100/H02 stem
- Handwheel
- EPDM Disc and o-rings

Resilient wedge gate valve parts

Catalog Part No.	Description	Material	Material Standard
G-16	Bonnet Bolts & Nuts	304 Stainless Steel	ASTM F593 (bolt) ASTM F594 (nut)
G-41	Stuffing Box Bolts & Nuts	304 Stainless Steel	ASTM F593 (bolt) ASTM F594 (nut)
G-49	Stem O-rings (3)	Nitrile	ASTM D2000
G-200	Wrench Nut Cap Screw	304 Stainless Steel	ASTM F593
G-201	Stuffing Box O-ring	Nitrile	ASTM D2000
G-202	Wrench Nut	Ductile Iron	ASTM A536 ▼
G-203	Stem	Bronze	ASTM B138
G-204	Hand Wheel (not shown)	Cast Iron	ASTM A126 CL.B
G-205	Stem Nut	Bronze	ASTM B584
G-206	Guide Cap Bearings	Acetal	-
G-207	Stuffing Box with dirt seal	Ductile Iron Nitrile	ASTM A536 ▼ ASTM D200
G-208	Anti-friction Washers (2)	Acetal	-
G-209	Wedge, Rubber Encapsulation	Ductile Iron* SBR	ASTM A536 ▼ ASTM D2000
G-210**	Bonnet	Ductile Iron	ASTM A536 ▼
G-211**	Bonnet gasket	Nitrile	ASTM D2000
G-212**	Body	Ductile Iron	ASTM A536 ▼

**Fully encapsulated in molded rubber with no iron exposed*

▼ Material strength ASTM A536 65-45-12 minimum

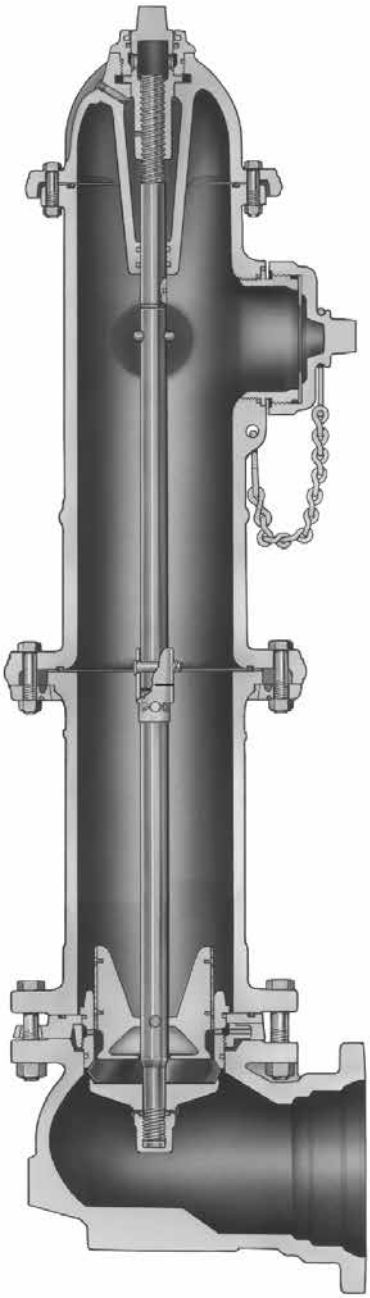


SEE PAGE 10.53 FOR ORDERING INSTRUCTIONS

MUELLER® SUPER CENTURION® FIRE HYDRANT

MUELLER SUPER CENTURION 250™ Fire Hydrant Features

- PRESSURE RATED: standard max. working pressure 250 psig (1725 kPa, 17 barg), optional 350 psig (2400 kPa, 24 barg). Test pressures 500 psig (3450 kPa, 35 barg) and 700 psig (4800 kPa, 48 barg) respectively.
- HOLD-DOWN NUT - with integral weather seal. Design discourages unauthorized removal of the hold-down nut or bronze operating nut. Resilient wiper seal between hold-down nut and operating nut prevents water entry to protect operating nut from freezing. Wiper seal material is resistant to ultra-violet ray deterioration. O-ring seal provides second level of protection.
- ANTI-FRICTION WASHER - Acetal washer on std. 250 psig hydrant; roller bearing on opt. 350 psig – helps assure easy operation for life of the hydrant.
- OIL FILLER PLUG - permits quick check of oil level. Lets you add oil without removing bonnet.
- OIL RESERVOIR O-RING SEALS - seal oil in, water out.
- STAINLES STEEL SAFETY STEM COUPLING - pulls free if hydrant is hit by a vehicle preventing damage to the stem and main valve. Coupling will not break into pieces that could drop into lower barrel and affect valve operation. Top of lower stem is below the top of the lower barrel so that a tire cannot depress the stem and open the main valve. Repair is easy and economical.
- SAFETY FLANGE - breaks cleanly to help prevent barrel damage, yet is strong enough to withstand normal handling. Allows economical repair, adding of extension section, rotation or changing of upper barrel without digging or water shut-off.
- BRONZE UPPER VALVE PLATE - conical design for smooth flow.
- DRAIN VALVE FACINGS - specially designed, long-life facings provide effective sealing.
- CAST IRON CAP NUT -retains main valve. Seats against cap nut gasket to prevent corrosion of stem threads. Locked in place by a stainless steel lock washer. Mueller HP Epoxy coated for durability.



- SHOE DESIGNED FOR MAXIMUM FLOW AND EASY CONNECTION - with its smooth transitional contours, extended neck and integral anti-rotation pads, allowing use of standard tee-head bolts. The inside of the shoe is covered with MUELLER HP® Epoxy Coating. This thermosetting epoxy forms a tough corrosion-resistant barrier to chemicals, physical impact and electrical currents.
- MEETS OR EXCEEDS all applicable requirements of ANSI/AWWA C502 Standard and UL 246 and FM 1510 specifications.
- O-RING SEALS AT BONNET, GROUND, AND SHOE FLANGES - for better leak resistance, easier maintenance.
- SEALED OIL RESERVOIR - O-ring sealed to prevent leakage. Provides positive lubrication of stem threads and bearing surfaces each time the hydrant is operated. Filled at the factory.
- FULL FLOW OPENINGS - large radius hose and pumper openings produce low friction loss.
- FIELD REPLACEABLE HOSE AND PUMPER NOZZLES - O-ring sealed. Threaded in place and retained by stainless steel locks. Nozzles are easily replaced.
- ELECTRO-GALVANIZED BOLTS AND NUTS - provide corrosion protection.
- NON-KINKING CHAINS - heavy-duty chains are securely attached to the hydrant. Special chain loop permits free turning of the cap.
- BRONZE SEAT RING - threaded into drain ring and O-ring sealed. Seat ring is easily removed or installed from above ground. Each time main valve is opened or closed, double drain valves force-flush both drain valve openings to keep them open for effective barrel drainage. Bronze drain valves are integral parts of main valve assembly.
- PATENTED REVERSIBLE, COMPRESSION-TYPE MAIN VALVE - closes with pressure for positive seal. Rubber material has long service life, yet is reversible providing a convenient spare in place – 350 opt. includes reinforced main valve for higher pressure holding capability (both main valves are interchangeable).

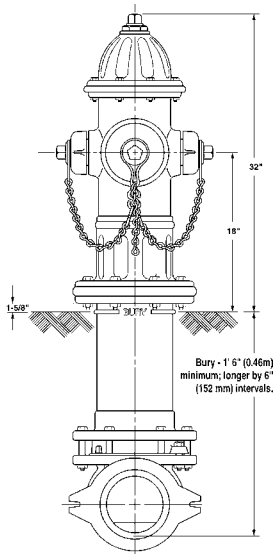
Manufactured under one or more of the following: U.S. Patent No. 4,717,178; 4,842,246.

MUELLER® SUPER CENTURION® FIRE HYDRANT

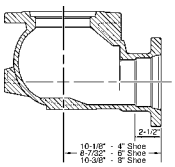
Rev. 4-14 Shaded area indicates changes

- **Super Centurion 250™ catalog numbers**
  - UL 246, FM 1510 ANSI/AWWA C502 250 psi rated
  A421 4-1/2" main valve opening 3-way (2 hose nozzle / 1 pumper nozzle)
  A423 5-1/4" main valve opening 3-way (2 hose nozzle / 1 pumper nozzle)
  A454 5-1/4" main valve opening 3-way (3 hose nozzle) *
  A455 5-1/4" main valve opening 4-way (4 hose nozzle) *
  A458 5-1/4" main valve opening 4-way (3 hose nozzle / 1 pumper nozzle) *
  A459 5-1/4" main valve opening 4-way (2 hose nozzle / 1 pumper nozzle)**
  * Hose Gate Valves required on FM Approved Models
  ** A459 is UL Listed and ANSI/AWWA C502
- **Super Centurion 350™ catalog number**
  - UL 246, FM 1510 ANSI/AWWA C502 350 psi rated
  A423 5-1/4" main valve opening 3-way (2 hose nozzle / 1 pumper nozzle)
- **Super Centurion 200™ catalog numbers**
  - UL 246, FM 1510 ANSI/AWWA C502 200 psi rated
  A-433 4-1/2" main valve opening 2-way (2 hose nozzle)
  A-435 5-1/4" main valve opening 2-way (2 hose nozzle)
  - ANSI/AWWA C502 200 psi rated
  A-420 4-1/2" main valve opening 2-way (2 hose nozzle)
  A-424 4-1/2" main valve opening 1-way (1 pumper nozzle)
  A-422 5-1/4" main valve opening 2-way (2 hose nozzle)
  A-425 5-1/4" main valve opening 2-way (2 hose nozzle)
  A-423 5-1/4" main valve opening 3-way (2 hose nozzle / 2 pumper nozzle)
- 10 year limited warranty on material and workmanship
- Meets all applicable parts of ANSI/AWWA C502 Standard
- Post type dry barrel design
- Dry top design with O-ring sealed oil reservoir
- Traffic feature with stainless steel safety stem coupling
- Compression-type main valve closes with pressure for positive seal; it is made of rubber and is conveniently reversible providing a spare for long service life
- Operating nut available in wide variety of shapes and sizes-open left or right
- Field replaceable hose and pumper nozzles
- Hose and pumper nozzles have large radius, full flow openings for low friction loss
- Contoured shoe is designed for full flow
- Dual bronze drain valves provide effective barrel drainage
- 350 psig (2400 kPa/24 barg) maximum working pressure, 700 psig (4800 kPa/48 barg) static test pressure;
  250 psig (1725 kPa/17 barg) maximum working pressure, 500 psig (3450 kPa/35 barg) static test pressure;
  200 psig (1400 kPa/14 barg) maximum working pressure, 400 psig (2800 kPa/28 barg) static test pressure

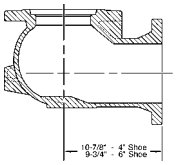
Dimensions



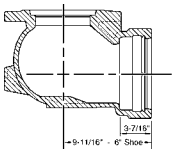
Mechanical joint standard and D-150



Flange
ASME B16.1 Class 125
PN 10/16 Drilling

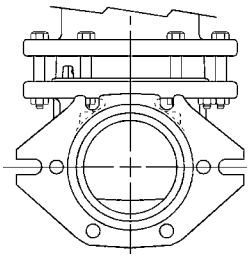


Slip-on

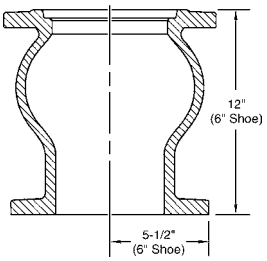


Non-rotating bolt design: cast-in pads eliminate need for anti-rotation bolts.

Front view detail of Mechanical joint (Standard only)



Vertical Flange
ASME B16.1 Class 125
PN 10/16 Drilling



SEE PAGE 9.28 FOR ORDERING INSTRUCTIONS

MEGA-COUPLING®

Series 3800

Restrained Coupling

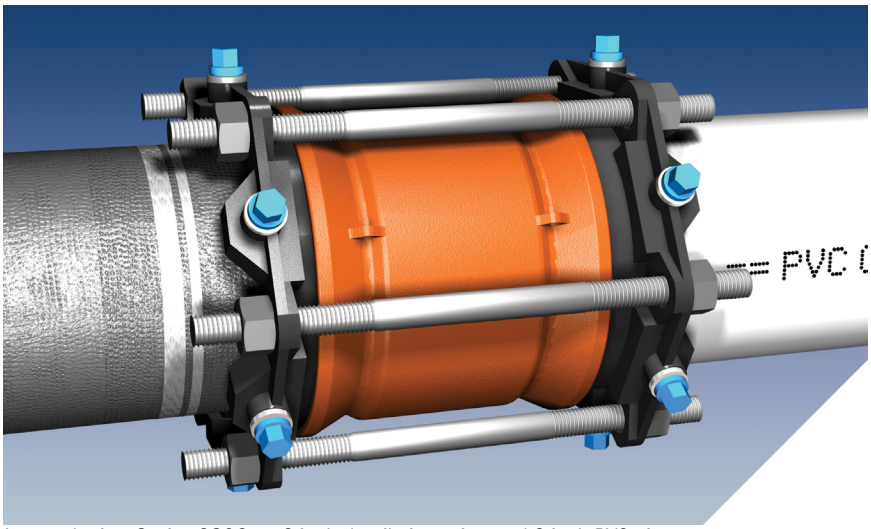


Image depicts Series 3806 on 6 inch ductile iron pipe and 6 inch PVC pipe.

The Series 3800 are designed to restrain forces based on the maximum working pressure ratings listed in the Pressure Ratings Table.

Forces experienced due to expansion/contraction of the pipe require special consideration.

For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774.

Features and Applications:

- **For use on:**
  - Ductile Iron Pipe, 4 in. - 36 in.
  - C900 or ASTM D2241 PVC Pipe, 4 in. - 12 in.
  - C905 PVC Pipe, 14 in. - 36 in.
  - Carbon Steel Pipe, 4 in. - 12 in.
  - HDPE Pipe, 4 in. - 12 in.
- **Minimum 2 to 1 Safety Factor**
- **MEGA-BOND® Restraint Coating System**
  For more information regarding MEGA-BOND, refer to our web site at www.ebaa.com
- **Constructed of ASTM A536 Ductile Iron**
- **Corrosion Resistant, low alloy, high strength steel bolts and nuts per ANSI/AWWA C111/A21.11**
- **Couplings meets or exceeds the applicable requirements of:**
  - AWWA C219
  - ASTM A536
  - ANSI/AWWA C111/A21.11
  - ASTM D2000

					Pressure Ratings (PSI)									
					HDPE Pipe			C900 PVC Pipe			C905 PVC Pipe			
Nominal Pipe Size	Series Number	Shipping Weight	Ductile Iron Pipe	Steel Pipe	DR11	DR13.5	DR17	DR14	DR18	DR25	DR18	DR25	DR32.5	DR41
4	3804	36.50	250	250	160	130	100	305	235	165	-	-	-	-
6	3806	49.40	250	250	160	130	100	305	235	165	-	-	-	-
8	3808	67.93	250	250	160	130	100	305	235	165	-	-	-	-
10	3810	85.46	250	250	160	130	100	305	235	165	-	-	-	-
12	3812	103.98	250	250	160	130	100	305	235	165	-	-	-	-
14	3814	157.18	350	-	-	-	-	-	-	-	235	165	125	80
16	3816	183.02	350	-	-	-	-	-	-	-	235	165	125	80
18	3818	201.64	250	-	-	-	-	-	-	-	200	165	-	-
20	3820	229.93	250	-	-	-	-	-	-	-	200	165	-	-
24	3824	364.24	250	-	-	-	-	-	-	-	165	165	125	100
30	3830	540.60	250	-	-	-	-	-	-	-	-	165	125	-
36	3836	695.90	250	-	-	-	-	-	-	-	-	125	125	-

Weights units are pounds and are approximate values.

Special Notes For Use On HDPE Pipe

For use on 4 inch through 12 inch HDPE only. The use of a pipe wall stiffening insert is required for use on HDPE pipe. The stiffeners must be sized to encompass the entire bearing length of the restraint devices. Pipe systems must be engineered to prevent movement causing fitting to slide or rotate.

EBAA products for HDPE are designed for underground pressurized fluid service and are pressure rated to match the pipe SDR pressure rating, de-rated as appropriate for service temperature. Maximum test pressure limited to pipe rated pressure.

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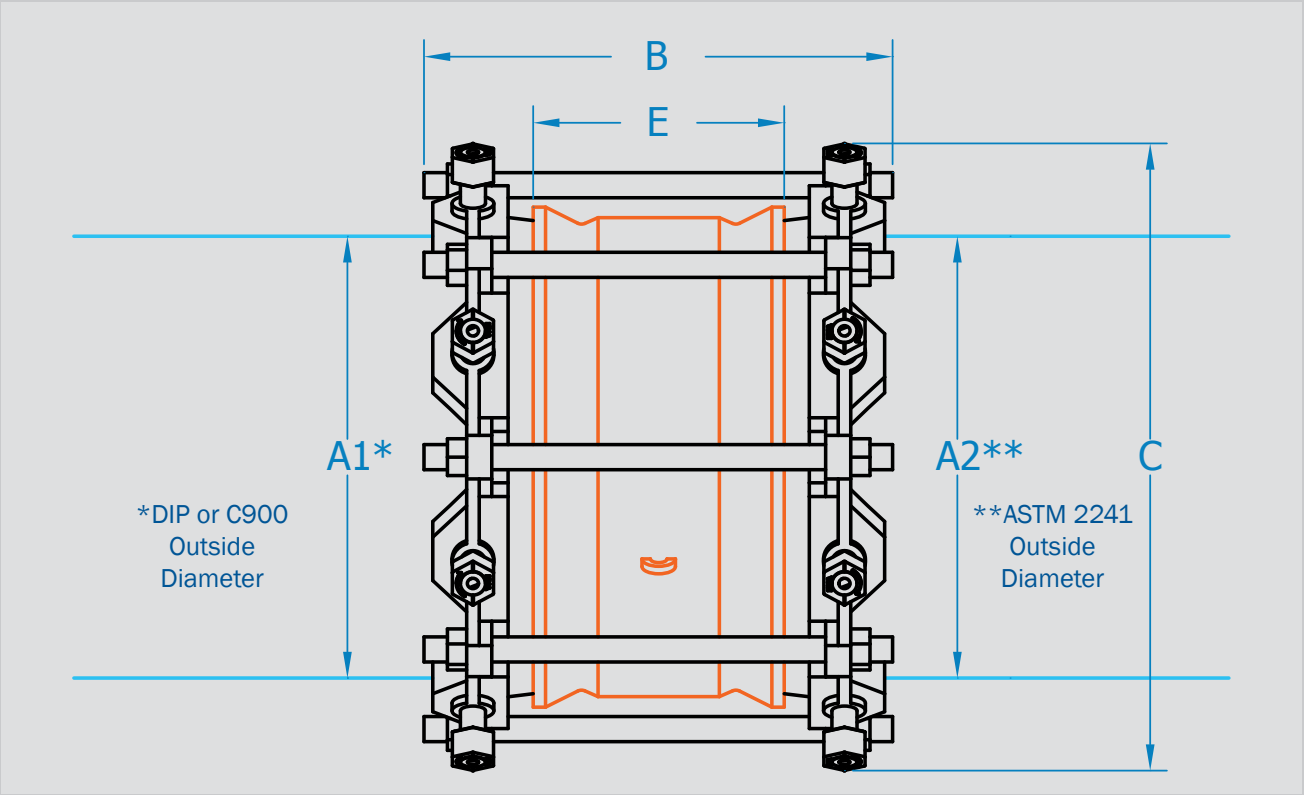
Series 3800 Submittal Reference Drawing 4 in. - 12 in.

EBAA IRON



MADE IN USA

Nominal Pipe Size	Series Number	A1* Pipe O.D. (Maximum)	A2** Pipe O.D. (Minimum)	B Overall Length	C† Max. Restraint O.D. (Casing Clearance)	D Thrust Bolt (Number-Size)	E Barrel Length	Maximum Deflection
4	3804	4.80	4.50	14.0	9.5	4 - ¾ x 14	7.5	4°
6	3806	6.90	6.63	14.0	12.1	6 - ¾ x 14	7.5	4°
8	3808	9.05	8.63	14.0	13.6	6 - ¾ x 14	7.5	4°
10	3810	11.10	10.75	14.0	16.0	8 - ¾ x 14	7.5	4°
12	3812	13.20	12.75	14.0	18.1	8 - ¾ x 14	7.5	4°

** Requires the use of a Transition Gasket. † As installed with Twist-Off nuts off.
Note: Dimensions are in inches (± 1%) and are subject to change without notice.

Sample Specification

Joint restraint to prevent axial separation shall be incorporated into the design of the sleeve or coupling used to connect two plain ends of same or dissimilar materials, such as Ductile Iron pipe, steel pipe, PVC pipe (C900 or ASTM D2241) and or High Density Polyethylene (HDPE) pipe. Internal pipe wall stiffeners must be used when restraining HDPE.

The restraint mechanism shall incorporate a plurality of individually actuating gripping surfaces to maximize restraint capability, and have torque limiting twist off nuts to insure proper actuating of the restraint devices. The restraint devices shall be coated using MEGA-BOND®. For complete specifications on MEGA-BOND visit www.ebaa.com.

The coupling sleeve internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Sealing gaskets shall be constructed of SBR. The coating and gaskets shall meet ANSI/NSF-61. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16. Ductile Iron components shall meet or exceed the requirements of ASTM A536, and shall be tested in accordance with said standard.

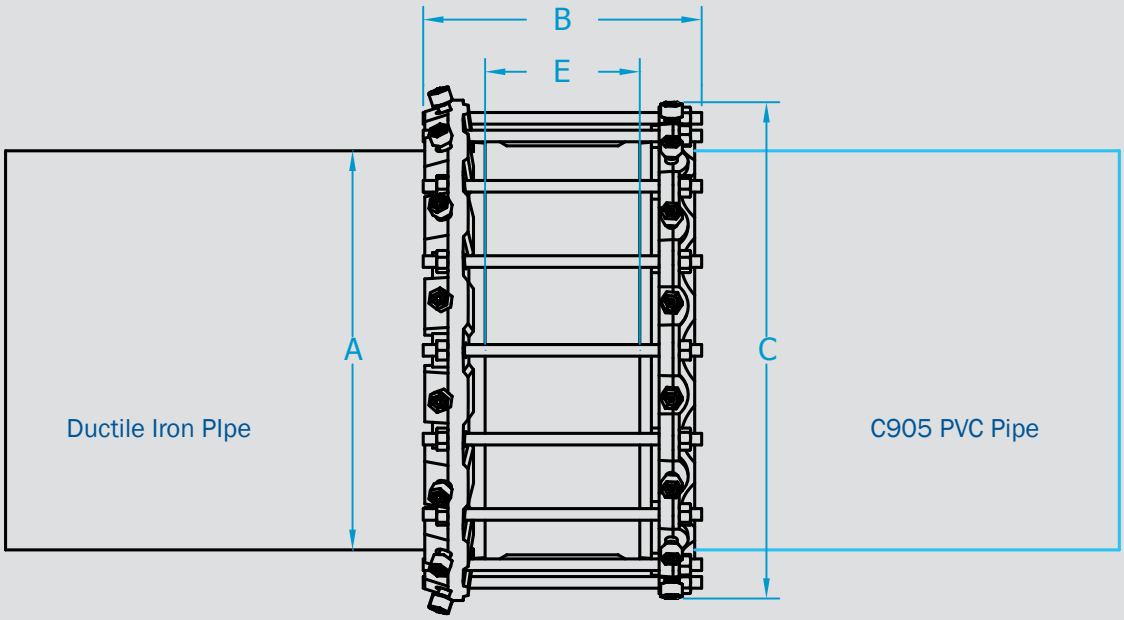
The restrained joining system shall meet the applicable requirements of AWWA C219, ANSI/AWWA C111/A21.11, and ASTM D2000.

The restrained coupling system shall be Series 3800 manufactured by EBAA Iron, Inc.

Series 3800 Submittal Reference Drawing 14 in. - 36 in.

EBAA IRON

MADE IN USA



Nominal Pipe Size	Series Number*	A Pipe O.D.	B Overall Length	C** Max. Restraint O.D. (Casing Clearance)	Thrust Bolt (Number-Size)	E Barrel Length	Maximum Deflection
14	3814XX	15.3	18.0	20.94	10 - ¾ x 18	10.0	4°
16	3816XX	17.4	18.0	23.00	12 - ¾ x 18	10.0	4°
18	3818XX	19.5	18.0	25.10	12 - ¾ x 18	10.0	4°
20	3820XX	21.6	18.0	27.20	14 - ¾ x 18	10.0	4°
24	3824XX	25.8	18.0	32.64	16 - ¾ x 18	10.0	4°
30	3830XX	32.0	20.0	38.87	20 - 1 x 20	10.0	3°
36	3836XX	38.3	20.0	45.17	24 - 1 x 20	10.0	3°

** As installed with Twist-Off nuts off.
Note: Dimensions are in inches (± 1%) and are subject to change without notice.

*Specifying the Proper Series Number

4 inch through 12 inch

For Nominal Pipe Sizes 4 inch through 12 inch the Series 3800 MEGA-COUPLING utilizes a common restraint ring for Ductile Iron Pipe (DIP), C900 PVC Pipe, ASTM D2241 PVC Pipe (IPS), Carbon Steel Pipe, and HDPE Pipe (with internal pipe wall stiffener for HDPE). The only item that needs to be specified during the order process for 4 inch through 12 inch is what type of gasket is required for joint assembly for the various pipe O.D.'s:

- 3800S for coupling either DIP, C900 PVC and or DIP O.D. HDPE Pipe
- 3800T for coupling either Carbon Steel and or ASTM D2241 PVC
- 3800ST for coupling either DIP, C900 PVC or DIP O.D. HDPE Pipe on one side and either Carbon Steel or ASTM D2241 PVC on the other side

14 inch through 36 inch

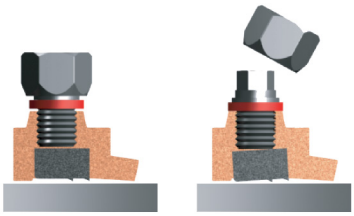
For Nominal Pipe sizes 14 inch and above the Series 3800 MEGA-COUPLING utilizes the Series 1100 MEGALUG® restraint on DIP and the Series 2000PV MEGALUG restraint on C905 PVC. Since the O.D. of both DIP and C905 PVC is the same, the EBAA-SEAL™ Improved Mechanical Joint Gasket is provided.

- 3800DI for coupling DIP
- 3800PV for coupling C905 PVC
- 3800DIPV for coupling one side DIP and other C905 PVC

Spacer Instructions (4 in. through 12 in. only)

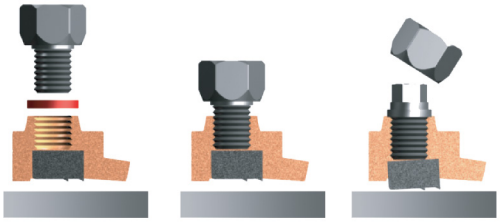
Ductile Iron or C900 PVC O.D. Sized Pipe

For installation on **Ductile Iron** or **C900 PVC sized pipe**, use as received and install per instructions.

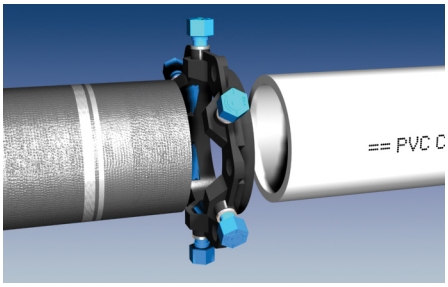


Steel or ASTM D2241 O.D. Sized Pipe (IPS O.D.)

For installation on **Steel** or **ASTM D2241 O.D. Sized pipe**, remove spacers and replace screws. Install per instructions.



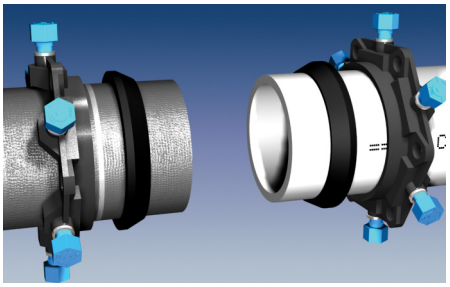
Installation Instructions



1. Identify the pipe. The spacers under the actuating screws must be removed for use on ASTM D2241 O.D. sized pipe (4 inch through 12 in. only). The spacers must remain in place for use on Ductile Iron or C900 PVC O.D. sized pipe. (See spacer instructions above)

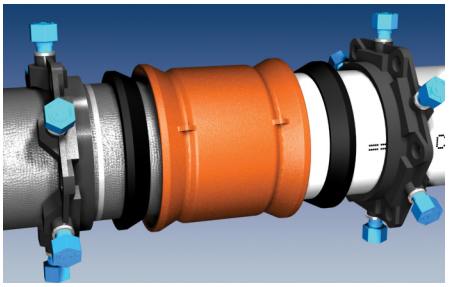
   Clean and inspect the pipe ends. Beveling of the ends is not necessary.

   If used on HDPE Pipe, a pipe wall stiffener insert that encompass the entire bearing length of the restraint devices must be installed prior to step two.

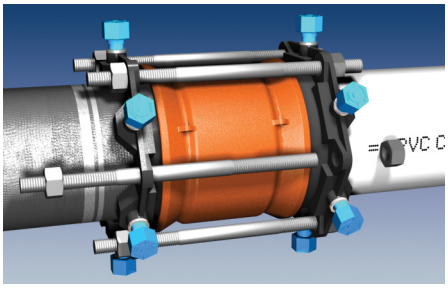


2. Place the end rings on the pipes with the lip extensions toward the pipe ends. For 4 inch through 12 the restraints will be the Series 2000HPV, for 14 inch and above Ductile Iron pipe the restraint ring will be the Series 1100 MEGALUG® and for C905 PVC 14 inch and above the restraint ringwill be the Series 2000PV MEGALUG. Lubricate and install the Standard Mechanical Joint Gasket.

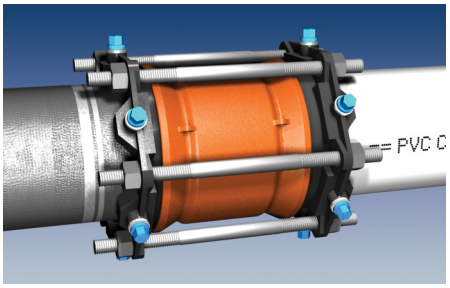
   (Standard Mechanical Joint Gaskets must be used with Ductile Iron Pipe and C900 PVC pipe 4 inch through 12 inch while the EBAA-SEAL™ Improved Mechanical Joint gasket is used on 14 inch and above. Transition gaskets must be used with Steel or ASTM D2241 pipe).



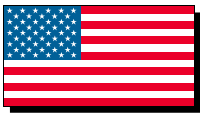
3. Center the sleeve body over the ends of the pipes while maintaining a 1/2” to 1” gap between the pipe ends. Slide the gaskets and end rings toward the sleeve body.



4. Install the threaded rods and hand tighten the nuts on each end. Gradually tighten the nuts in an alternating manner until the proper torque value has been reached, while maintaining the same distance between the rings and the ends of the body at all points around the rings. For 4 inch through 24 inch torque to 75-90 ft.-lbs., for 30 and 36 torque to 120-150 ft.-lbs.



5. Hand tighten the actuating screws until all wedges are touching the pipes. Continue tightening the screws in an alternating manner until the torque limiting heads twist off. The screws may bottom out during this step.



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Appendix B:
Sewer Components Cut-sheets and Calculations

SULZER

Submersible grinder pumps type ABS Piranha

Main applications

Sulzer's range of submersible grinder pumps, type ABS Piranha, contain the most effective cutting system for use in pressure sewer systems. The Piranha pumps have proven themselves to be one of the market's best ongoing performers, having excellent total lifecycle costs from initial purchase through ongoing operation.

The Piranha pumps provide a means of effective and economical wastewater transport utilizing small-diameter discharge pipes as opposed to larger diameter pipes required for gravity systems. These pumps are ideally suited for:

- Private residences and community subdivisions
- Municipal wastewater transport
- Commercial wastewater handling of domestic sewage in business parks, restaurants, hospitals, industrial areas, etc.
- Industrial wastewater handling of industrial areas, slaughter houses, food processing plants, paper mills, agricultural applications, etc.
- Hazardous locations requiring certification in accordance with ATEX (EX II 2 G k Ex d IIB T4); FM and CSA available as an option on most models

The most effective cutting system

PE and S series

The Piranha PE and S series cutter system features a completely different concept in grinder pump design. The design consists of a lobed rotor cutting element attached to a centrifugal impeller working in tandem with a stationary cutting element fastened to a spiral-grooved bottom plate. The lobed rotor turns inside the stationary cutter designed with wave-shaped castellations. The number of waves is one less than the number of lobes on the rotor. This causes an opening to be formed between the rotor and stationary cutter. The normal pumping action of the impeller causes water and solids to flow into the cutting elements and as the solids are sheared into small particles, they are pumped by the impeller into the discharge pipe. Should any of the finely cut particles try to wedge between the impeller and bottom plate, the outward threaded spiral grooves will move them to the discharge.

S series (high head)

The Piranha S Series (High Head) cutter system features another unique concept in grinder pump design. The design consists of a two-blade, two-stage, primary cutting element attached to the first-stage centrifugal impeller working in tandem with a stationary cutting element fastened to an adjustable bottom plate. The two-blade rotor turns inside the stationary cutter designed with multiple, sharp-edged faces. The number of faces is uneven with the number of blades on the rotor, causing a constant shearing opening to be formed between the rotor and stationary cutter. The normal pumping action of the impeller causes water and solids to flow into the cutting elements, and as the solids are sheared into small particles, the second stage of the rotor shears the particles a second time to a very fine pulp and then pumped by the impeller into the discharge pipe. Should any of the finely cut particles try to wedge between the impeller and bottom plate, the intercepted slots will dislodge them and move them to the discharge.

The right installation to fit any need

The Piranha grinder pumps can be installed in several configurations to fulfill virtually any customer requirements, including:

- Fixed installations with pedestal (guide rail assembly)
- Freestanding, transportable applications
- Installation in areas where large fluctuations in terrain elevation are present

Features and benefits

Piranha PE

Sulzer's premium range of submersible grinder pumps, type ABS Piranha PE, are equipped with Premium Efficiency IE3 Motors in accordance to IEC 60034-20.

Sulzer was the first company in the world to offer Premium Efficiency IE3 submersible motors to achieve the perfect balance of reliability and energy consumption. Utilizing Premium Efficiency IE3 motors and the most effective cutting system, the Piranha grinder pumps are one of the best pumps on the market resulting in zero blockages and low life cycle costs, providing reliability and energy savings.

1 Piranha cutting system
- A spiral-grooved bottom plate and stationary cutting element, combined with a lobed rotor cutting element prior to the impeller provide optimum, blockage-free operation

2 Seal leak detection system
- Advanced warning allows for repair of the pump seal prior to water entering the motor

3 Premium Efficiency Motor (IE3) in accordance to IEC 60034-30
- Low Life Cycle Costs through energy savings
- Significant CO_2 footprint reduction
- Increased lifetime due to low winding temperature rise

4 Double mechanical seals
- Silicon carbide/silicon carbide (SiC/SiC) provides maximum resistance from abrasives
- Seal protection system increases the longevity of the lower seal and reduces maintenance costs
- SiC/SiC is chemical resistant in wastewater and most other industrial applications

5 Small diameter discharges (DN32/1-1/4" threaded and DN50/2" flanged)
- Low installation costs
- Can be installed in areas where the laying of conventional sewer pipes would not be physically possible

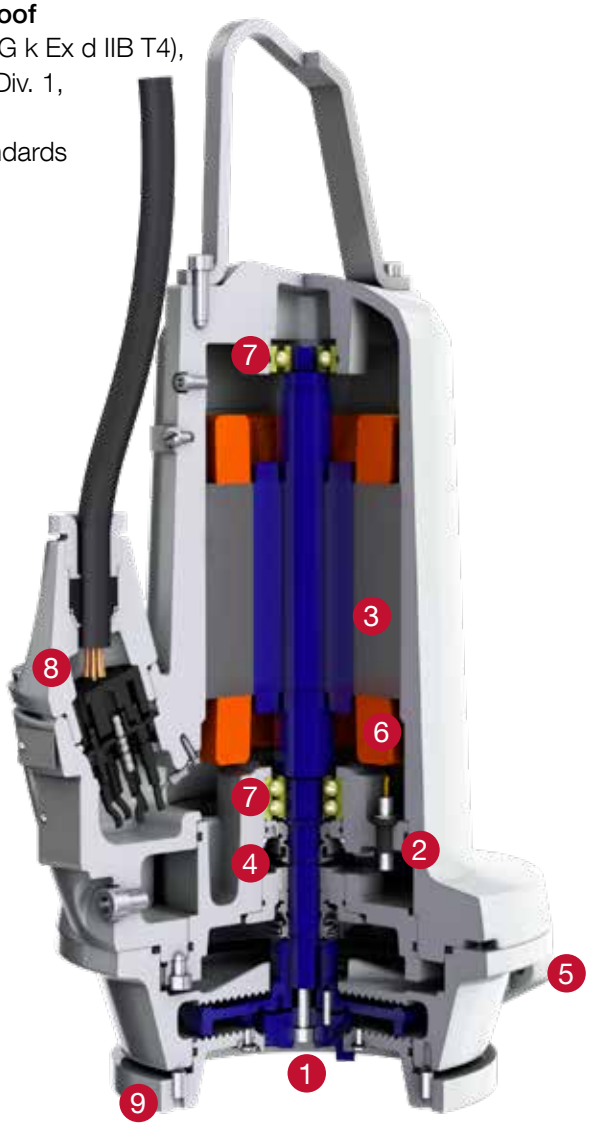
6 Temperature monitoring
- Thermal sensors are embedded in the stator windings and can be used to shut the pump off in case of overheating and automatically switch back on once cooled

7 Bearings
- The stainless steel motor shaft is supported by lubricated-for-life, heavy-duty, ball bearings

8 Cable plug
- To facilitate the quick and easy changing or repair of the power cable, the connection between the cable and motor is by means of an integrated 10-pole, quick disconnect, terminal block

9 Adjustable bottom plate
- To counter the effects of wearing and to maintain efficiency, the optimum clearance between the bottom plate and the impeller can easily be restored

Explosion proof
- ATEX (EX II 2 G k Ex d IIB T4), FM (Class 1, Div. 1, Groups C&D), and CSA standards available



Features and benefits

S series

Sulzer's standard range of submersible grinder pumps, type ABS Piranha S, are equipped with water-tight, fully encapsulated, flood-proof motors. The pump and motor section form a compact unit, providing an economical, yet robust solution without compromising on the reliable design.

1 Piranha cutting system
- A spiral-grooved bottom plate and hardened stainless steel stationary cutting element, combined with a hardened stainless steel lobed rotor cutting element prior to the impeller provide optimum, blockage-free operation

2 Seal leak detection system*
- Advanced warning allows for repair of the pump seal prior to water entering the motor

3 Shaft sealing
- High quality silicon carbide (SiC/SiC) mechanical seal
- Motor-side sealing provided by an oil lubricated lip seal arrangement

4 Small diameter discharge
- Low installation costs
- Can be installed in areas where the laying of conventional sewer pipes would not be physically possible

5 Explosion proof (optional)
- In accordance with FM (Class 1, Div. 1, Groups C&D) and CSA

6 Bearings
- The stainless steel motor shaft is supported by lubricated-for-life, heavy-duty, ball bearings

7 Temperature monitoring
- Thermal sensors are embedded in the stator windings and can be used to shut the pump off in case of overheating and automatically switch back on once cooled

8 Adjustable bottom plate
- To counter the effects of wearing and to maintain efficiency, the optimum clearance between the bottom plate and the impeller can easily be restored

9 Cable plug (non-EX/FM models)*
- To facilitate the quick and easy changing or repair of the power cable, the connection between the cable and motor is by means of an integrated pin-style, Easy-Fit terminal block

Built-in capacitor**
- Does not require a control box

*not available for Piranha 09
** Piranha 08 and 09 only

Features and benefits

S series (high head)

Sulzer's high head models within the standard range of submersible grinder pumps, type ABS Piranha S, are equipped with watertight, fully encapsulated, flood-proof motors and a two-stage pump. The pump and motor section form a compact unit, providing an economical, yet robust solution without compromising on the reliable design for high head applications.

1 Piranha cutting system
- A reversible and hardened stainless steel stationary cutting element, combined with a two-stage, hardened stainless steel lobed rotor cutting element prior to the impeller, provide optimum, blockage-free operation

2 Seal leak detection system
- Advanced warning allows for repair of the pump seal prior to water entering the motor

3 Shaft sealing
- High quality silicon carbide (SiC/SiC) mechanical seal
- Motor-side sealing provided by an oil lubricated lip seal arrangement

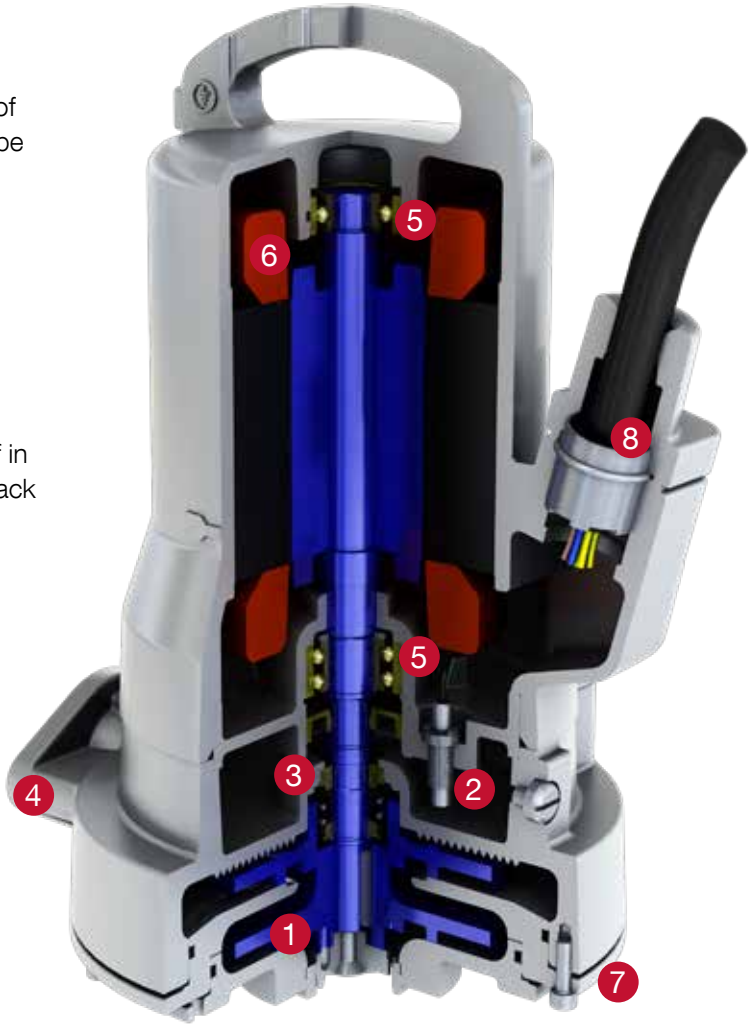
4 Small diameter discharge
- Low installation costs
- Can be installed in areas where the installation of conventional sewer pipes would not physically be possible

5 Bearings
- The stainless steel motor shaft is supported by lubricated-for-life, heavy-duty, ball bearings

6 Temperature monitoring
- Thermal sensors are embedded in the stator windings and can be used to shut the pump off in case of overheating and automatically switch back on once cooled

7 Adjustable bottom plate
- To counter the effects of wearing and to maintain efficiency, the optimum clearance between the bottom plate and the impeller can easily be restored

8 Cable plug
- To facilitate the quick and easy changing or repair of the power cable, the connection between the cable and motor is by means of an integrated pin-style, Easy-Fit terminal block



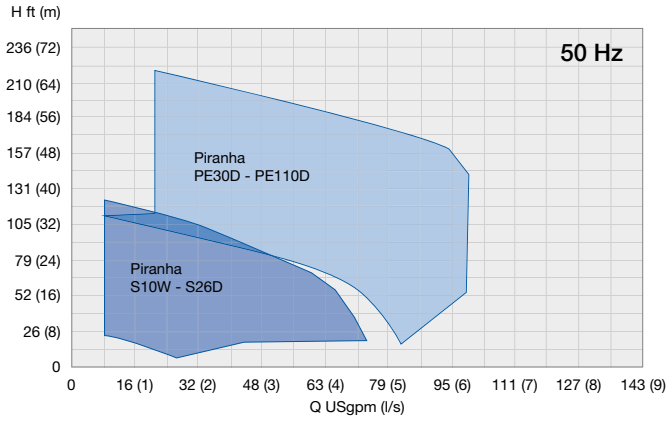
Submersible grinder pumps type ABS Piranha

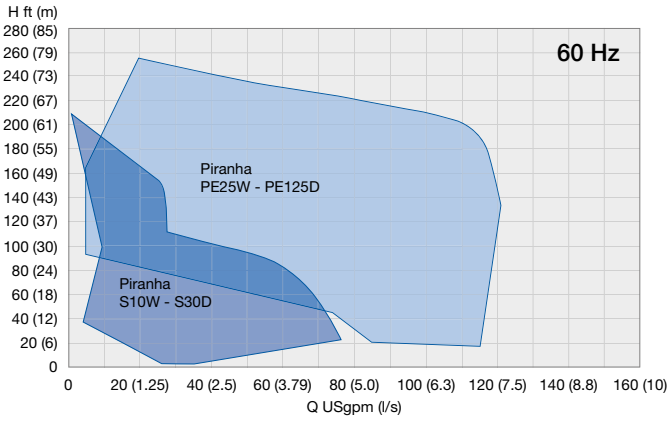
Oil and gas | Hydrocarbon processing | Power generation | Pulp, paper and board | General industry | Chemical process industry | **Water and wastewater**

Operating data

50 Hz		60 Hz
32 to 50 mm	Pump sizes	1¼ to 2 in 32 to 50 mm
up to 6 l/s	Capacities	up to 122 USgpm up to 8 l/s
up to 71 m	Heads	up to 265 ft up to 81 m
up to 7 bar	Pressures	up to 116 psi up to 8 bar
40°C 60°C (short term)	Temperatures	104°F / 40°C 140°F / 60°C (short term)

Performance ranges





Materials

Pump part	Material
Motor housing, volute, impeller, bottom plate	Cast iron EN-GJL-250 (ASTM A-48, Class 35B)
Rotor shaft	Stainless steel 1.4021 (AISI 420)
Fasteners	Stainless steel 1.4401 (AISI 316)
Mechanical seal	Silicon carbide
Rotating and stationary cutters	Stainless steel 1.4528 (AISI 440B+Co), 58-62 HRC

We do what we say

Operational excellence

We continuously strive to be faster and better.

Customer partnership

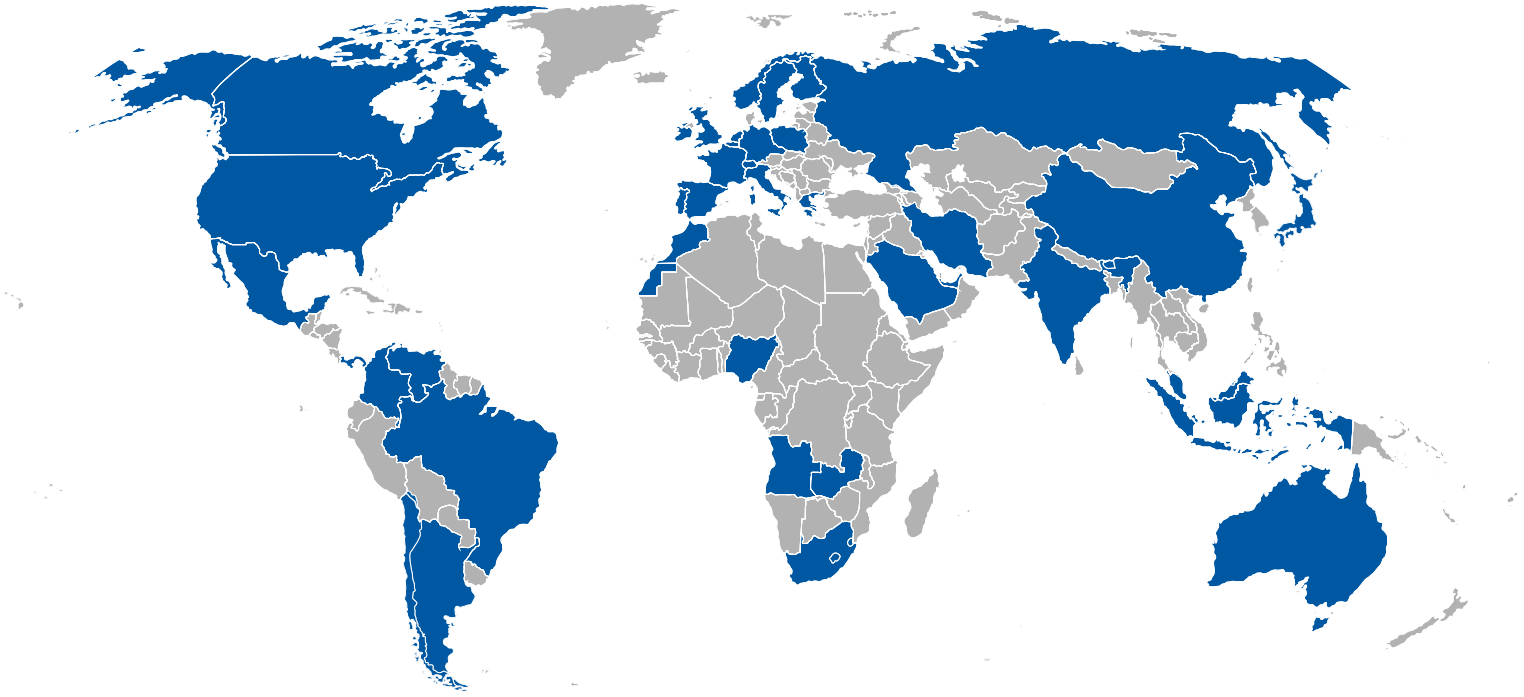
Together, we win.

Committed people

We build on the strengths and diversity of our people.

A global specialist at your doorstep

Sulzer serves clients worldwide through a network of over 150 production and service sites and has a strong footprint in emerging markets.



www.sulzer.com

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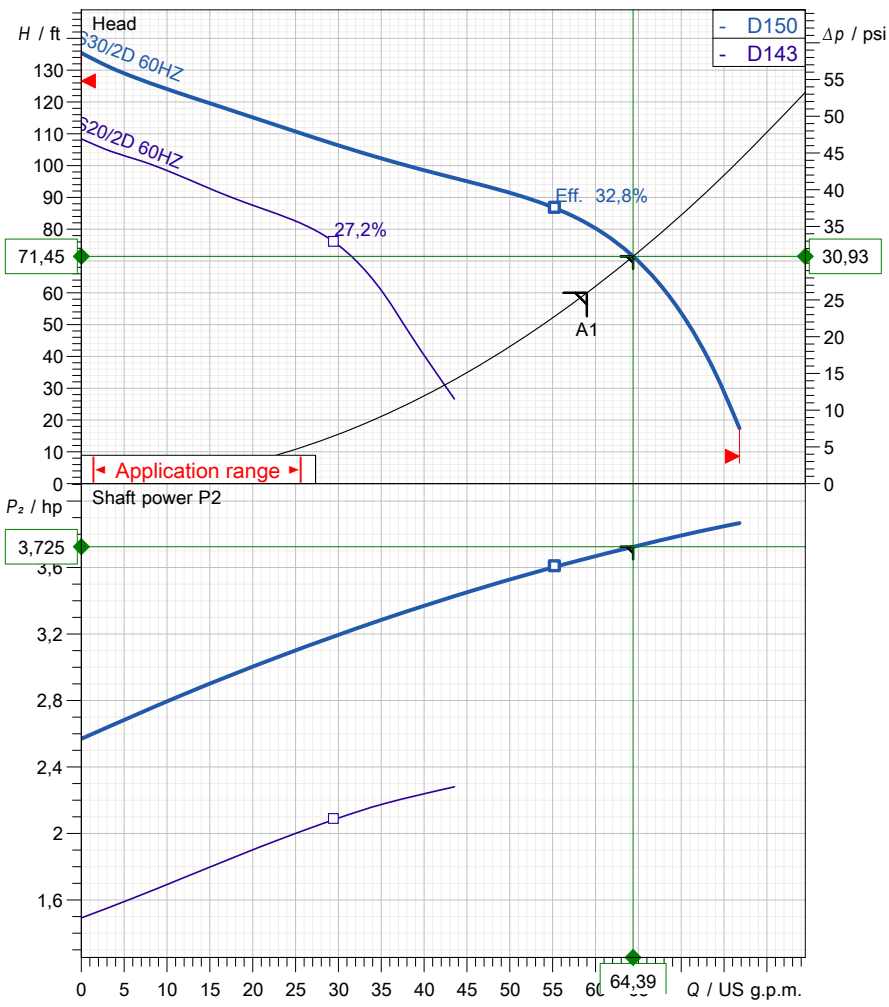
PIRANHA S D 60 HZ



Testnorm
ISO9906:2012,HI 11.6/14.6≤10kW

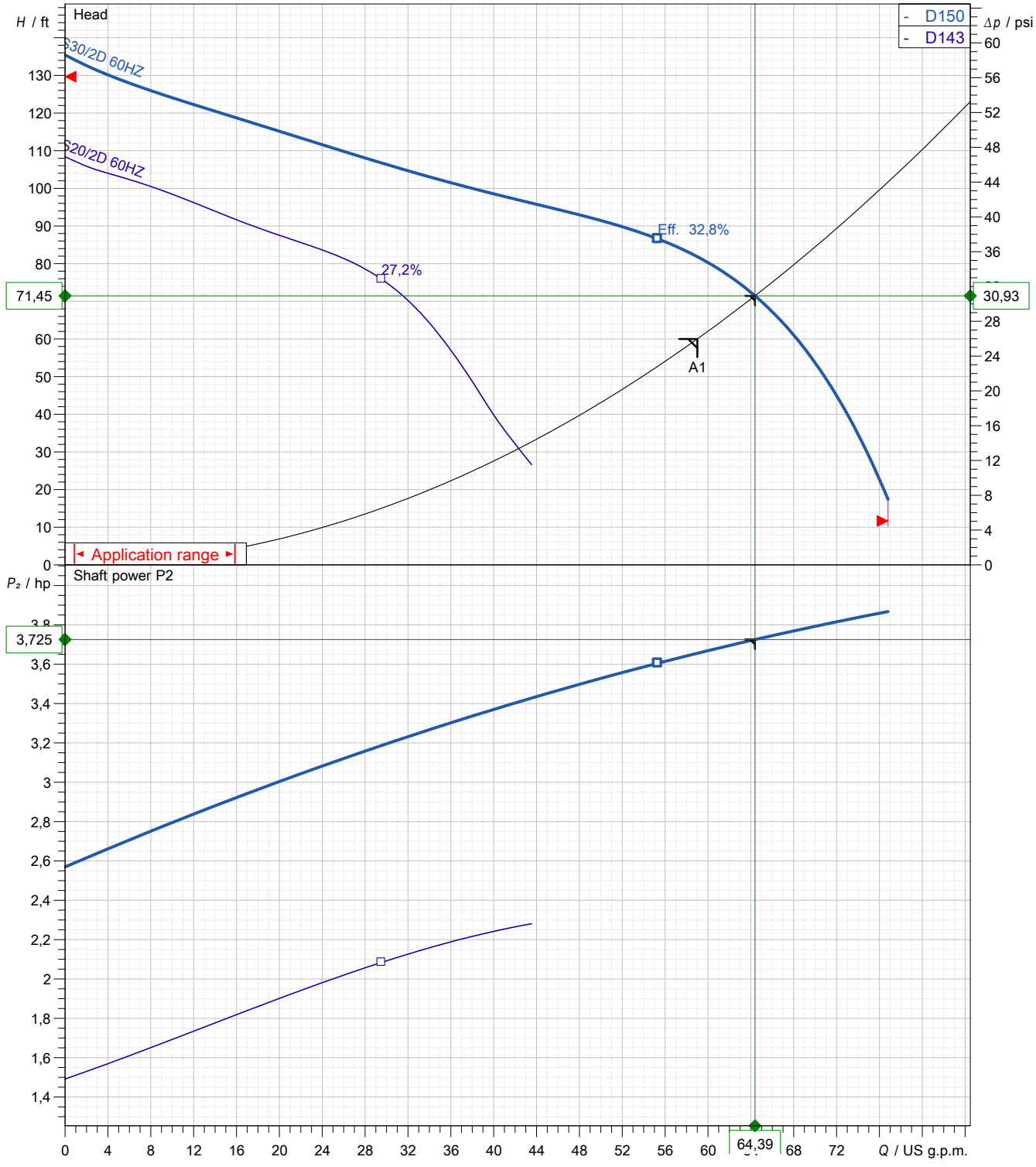
2019-12-19

Operating data specification			
Flow	64,39 US g.p.m.	Power input	4,75 hp
Efficiency	30,5 %	Head	71,5 ft
NPSH		Rated power	3,73 hp
Temperature	68 °F	Fluid	Wastewater
No. of pumps	1	Nature of system	Single head pump
Pump data			
Type	PIRANHA S D 60 HZ	Make	SULZER
Series	PIRANHA & PIRANHA PE	Impeller	Macerator
N° of vanes	4	Impeller size	6inch
Free passage		Suction flange	
Discharge flange	G1¼"	Type of installation	
Moment of inertia			Wet-well Installation
Motor data			
Rated voltage	208 V	Frequency	60 Hz
Rated power P2	4,02 hp	Nominal Speed	3400 rpm
Number of poles	2	Efficiency	77,9 %
Power factor	0,88	Rated current	12,1 A
Starting current	80,3 A	Rated torque	6,22 lbf ft
Starting torque	15,8 lbf ft	Degree of protection	IP 68
Insulation class	F	No. starts per hour	15

Sulzer reserves the right to change any data and dimensions without prior notice
and can not be held responsible for the use of information contained in this software.

Curve number	Pump performance curves	SULZER
Reference curve PIRANHA S D 60HZ	**PIRANHA S D 60 HZ**	

					Discharge	Frequency
					G1¼"	60 Hz
Density	Viscosity	Testnorm			Rated speed	Date
62,31 lb/ft³	1,077E-5 ft²/s	ISO9906:2012,HI 11.6/14.6≤10kW			3418 rpm	2019-12-19
Flow	Head	Shaft power	Power input	Rated power P2	Hydraulic efficiency	NPSH
64,39 US g.p.m	71,5 ft	3,73 hp	4,75 hp	4,02 hp	30,5 %	

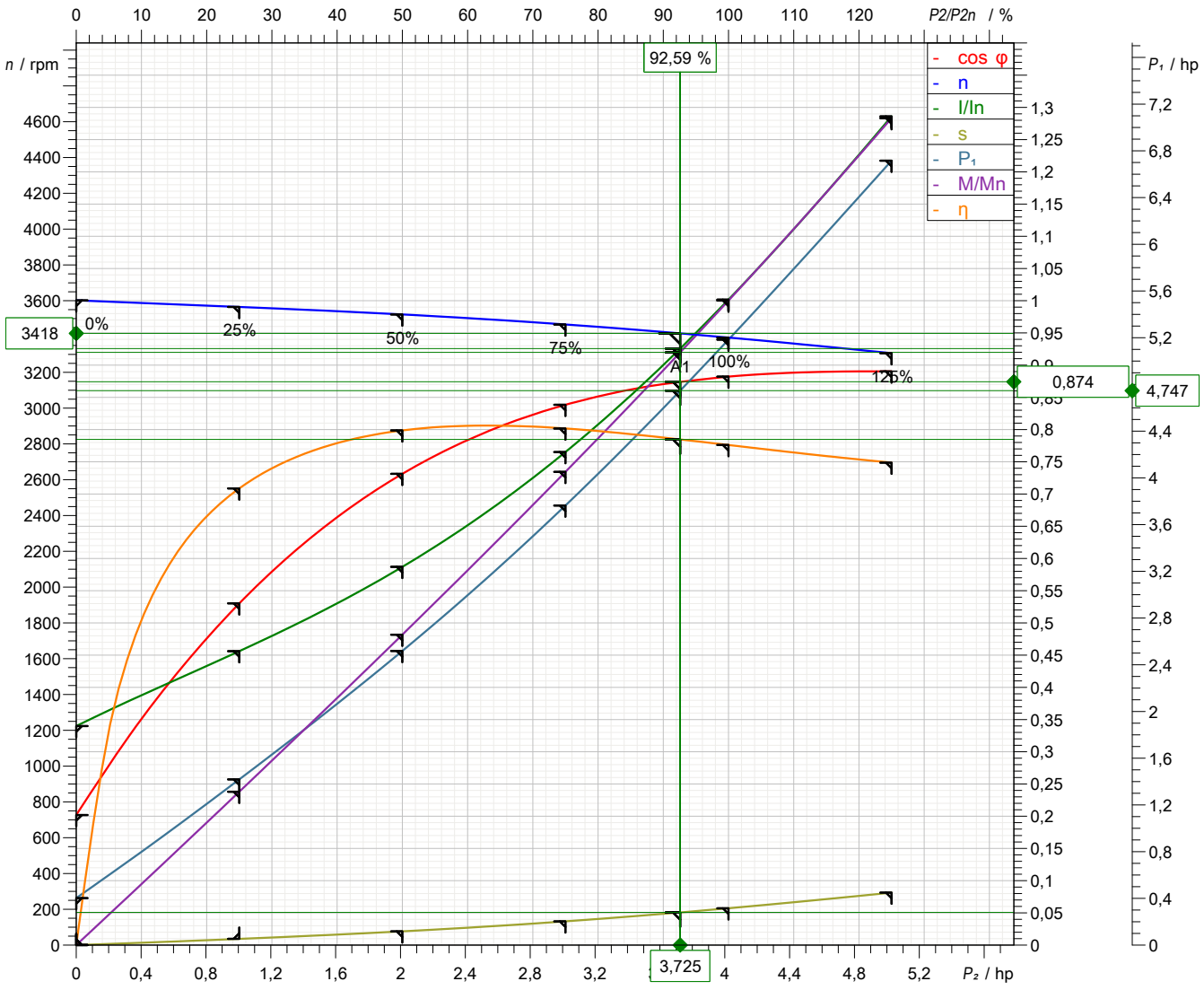


Impeller size	N° of vanes	Impeller	Solid size	Revision
6inch	4	Macerator		

Sulzer reserves the right to change any data and dimensions without prior notice
and can not be held responsible for the use of information contained in this software.

Frequency 60 Hz		**Motor performance curve** S30/2D 60HZ	SULZER

Rated power	Service factor	Nominal Speed	Number of poles	Rated voltage	Date
4,02 hp	1	3400 rpm	2	208 V	2019-12-19



Symbol	No load	25 %	50 %	75 %	100 %	125 %
P_2 / hp	0	1,006	2,012	3,017	4,023	5,029
P_1 / hp	0,4026	1,419	2,518	3,764	5,184	6,716
η / %	0	70,88	79,87	80,17	77,61	74,88
n / rpm	3602	3565	3523	3467	3394	3307
cos φ	0,2019	0,5304	0,7314	0,8385	0,8822	0,8903
I / A	4,127	5,538	7,127	9,29	12,16	15,61
s / %	0	0,9647	2,135	3,687	5,72	8,144
M / lbf ft	0	1,482	2,999	4,571	6,226	7,988

Tolerance according to VDE 0530 T1 12.84 for rated power

Starting current	Starting torque	Moment of inertia	No. starts per hour
80,3 A	15,8 lbf ft		15

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Spaix® 4, Version 4.3.12 - 2019/08/29 (Build 267
Data version Sept 2019

QT025A

GENERAC® | INDUSTRIAL POWER

Industrial Gaseous Generator Set

EPA Certified Stationary Emergency

QT025A 25kW

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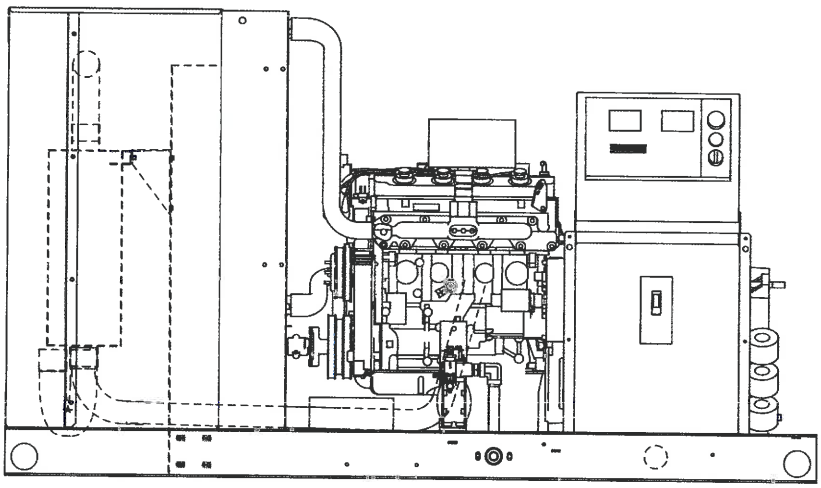
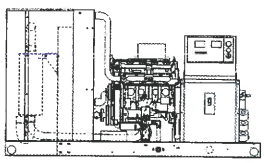
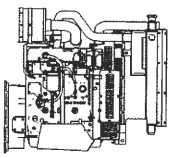
Standby Power Rating

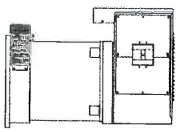
31kVA 25kW 60Hz

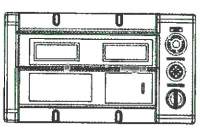


Generator image used for illustration purposes only









features benefits

Generator Set	
• PROTOTYPE & TORSIONALLY TESTED	› PROVIDES A PROVEN UNIT
• UL2200 TESTED	› ENSURES A QUALITY PRODUCT
• RHINOCOAT PAINT SYSTEM	› IMPROVES RESISTANCE TO ELEMENTS
Engine	
• EPA COMPLIANT	› ENVIRONMENTALLY FRIENDLY
• INDUSTRIAL TESTED, GENERAC APPROVED	› ENSURES INDUSTRIAL STANDARDS
• POWER-MATCHED OUTPUT	› ENGINEERED FOR PERFORMANCE
• INDUSTRIAL GRADE	› IMPROVES LONGEVITY AND RELIABILITY
Alternator	
• TWO-THIRDS PITCH	› ELIMINATES HARMFUL 3RD HARMONIC
• LAYER WOUND ROTOR & STATOR	› IMPROVES COOLING
• CLASS H MATERIALS	› HEAT TOLERANT DESIGN
• DIGITAL 3-PHASE VOLTAGE CONTROL	› FAST AND ACCURATE RESPONSE
Controls	
• ENCAPSULATED BOARD W/ SEALED HARNESS	› EASY, AFFORDABLE REPLACEMENT
• 4-20mA VOLTAGE-TO-CURRENT SENSORS	› NOISE RESISTANT 24/7 MONITORING
• SURFACE-MOUNT TECHNOLOGY	› PROVIDES VIBRATION RESISTANCE
• ADVANCED DIAGNOSTICS & COMMUNICATIONS	› HARDENED RELIABILITY

primary codes and standards

NEMA · cULus LISTED · NFPA · ASME · ISO

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QT025A

application and engineering data

ENGINE SPECIFICATIONS

General

Make	Generac
EPA Emissions Compliance	Stationary Emergency
EPA Emissions Engine Reference	See Emissions Data Sheet
Cylinder #	4
Type	In-line
Displacement - L	2.4
Bore - mm (in.)	86.61 (3.41)
Stroke - mm (in.)	100.08 (3.94)
Compression Ratio	9.5:1
Intake Air Method	Naturally Aspirated
Number of Main Bearings	5
Connecting Rods	Forged
Cylinder Head	Aluminum
Cylinder Liners	No
Ignition	High Energy
Pistons	Aluminum Alloy
Crankshaft	Cast
Lifter Type	Overhead Cam
Intake Valve Material	Steel Alloy
Exhaust Valve Material	Hardened Steel
Hardened Valve Seats	Yes

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full-flow spin-on cartridge
Crankcase Capacity - L (qts)	3.8 (4)

Cooling System

Cooling System Type	Pressurized Closed
Water Pump Flow	11 gal/min
Fan Type	Pusher
Fan Speed (rpm)	2150
Fan Diameter mm (in.)	457 (18)
Coolant Heater Wattage	1500
Coolant Heater Standard Voltage	120VAC

Fuel System

Fuel Type	Natural Gas, Propane Vapor
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure	5" - 14" H2O*

*Fuel pressure must remain within specified range and not drop more than 1 in. w.c. from static (no-load) to full load.

Engine Electrical System

System Voltage	12VDC
Battery Charging Alternator (Amps)	30
Battery Size (at 0°C)	525CCA
Battery Group	26
Battery Voltage	12VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	390mm
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5%
Telephone Interference Factor (TIF)	<50
Standard Excitation	Brush Type
Bearings	Sealed Ball
Coupling	Flexibile Disc
Load Capacity - Standby	100%
Prototype Short Circuit Test	Yes

Voltage Regulator Type	Full Digital
Number of Sensed Phases	3
Regulation Accuracy (Steady State)	+/- 0.25%

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	+/- 0.25%

CODES AND STANDARDS COMPLIANCE (WHERE APPLICABLE)

NFPA 99
NFPA 110
ISO 8528-5
ISO 1708A.5
ISO 3046
BS5514
SAE J1349
DIN6271
IEEE C62.41 TESTING
NEMA ICS 1
UL2200

Rating Definitions:
Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability. (Max. load factor = 70%)

QT025A

operating data (60Hz)

POWER RATINGS (kW)

	Natural Gas		Propane Vapor	
Single-Phase 120/240VAC @1.0pf	25	Amps: 104	25	Amps: 104
Three-Phase 120/208VAC @0.8pf	25	Amps: 87	25	Amps: 87
Three-Phase 120/240VAC @0.8pf	25	Amps: 75	25	Amps: 75
Three-Phase 277/480VAC @0.8pf	25	Amps: 38	25	Amps: 38

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

		480VAC						208/240VAC					
Alternator	kW	10%	15%	20%	25%	30%	35%	10%	15%	20%	25%	30%	35%
Standard	25	16	25	33	41	49	57	12	19	25	31	37	43

FUEL

Fuel Consumption Rates*

Natural Gas			Propane Vapor		
Percent Load	ft³/hr	m³/hr	Percent Load	ft³/hr	m³/hr
25%	140	3.9	25%	56	1.6
50%	220	6.2	50%	87	2.5
75%	300	8.5	75%	119	3.4
100%	380	10.8	100%	151	4.3

* Refer to "Emissions Data Sheet" for maximum fuel flow for EPA and SCAQMD permitting purposes.

COOLING

		STANDBY
Air Flow (inlet air combustion and radiator)	ft³/min (m³/min)	1500 (42.48)
System Coolant Capacity	Gal (Liters)	2.5 (9.46)
Heat Rejection to Coolant	BTU/hr	95,000
Max. Operating Air Temp on Radiator	°F (°C)	122 (50)
Max. Ambient Temperature	°F (°C)	104 (40)
Maximum Radiator Backpressure	in H_2O	1.5

COMBUSTION AIR REQUIREMENTS

		STANDBY
Flow at Rated Power	cfm	70

ENGINE

		STANDBY
Rated Engine Speed	rpm	1800
Horsepower at Rated kW**	hp	40
Piston Speed	ft/min	1182
BMEP	psi	120

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		STANDBY
Exhaust Flow (Rated Output)	cfm (m³/min)	220 (6.2)
Maximum Recommended Back Pressure	inHg	1.5
Exhaust Temp (Rated Output)	°F (°C)	975 (524)
Exhaust Outlet Size	in	2.5

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions. Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards.

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standard features and options

GENERATOR SET

●	Genset Vibration Isolation	Std
○	Extended warranty	Opt
○	Gen-Link™ Communications Software	Opt
○	Steel Enclosure	Opt
○	Aluminum Enclosure	Opt

ENGINE SYSTEM

General

●	Oil Drain Extension	Std
●	Critical Exhaust Silencer	Std
●	Air cleaner	Std
●	Fan guard	Std
●	Radiator duct adapter	Std

Fuel System

●	Fuel lockoff solenoid	Std
●	Secondary Fuel Regulator	Std
●	Flexible fuel lines	Std

Cooling System

●	120VAC Coolant Heater	Std
●	Closed Coolant Recovery System	Std
●	UV/Ozone resistant hoses	Std
●	Factory-Installed Radiator	Std
●	Radiator Drain Extension	Std

Engine Electrical System

●	Battery charging alternator	Std
●	Battery cables	Std
●	Battery tray	Std
●	Solenoid activated starter motor	Std
●	10A UL float/equalize battery charger	Std
●	Rubber-booted engine electrical connections	Std

ALTERNATOR SYSTEM

●	UL2200 GENprotect™	Std
●	Main Line Circuit Breaker	Std

CONTROL SYSTEM

Control Panel

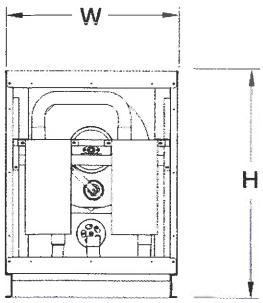
●	Digital H Control Panel - Dual 4x20 Display	Std
●	Programmable Crank Limiter	Std
○	21-Light Remote Annunciator	Opt
○	Remote Relay Panel (8 or 16)	Opt
●	7-Day Programmable Exerciser	Std
●	Special Applications Programmable PLC	Std
●	RS-232 Communications	Std
●	RS-485 Communications	Std
●	All-Phase Sensing DVR	Std
●	Full System Status	Std
●	Utility Monitoring (Req. H-Transfer Switch)	Std
●	2-Wire Start Compatible	Std
●	Power Output (kW)	Std
●	Power Factor	Std
●	Reactive Power	Std
●	All phase AC Voltage	Std
●	All phase Currents	Std
●	Oil Pressure	Std
●	Coolant Temperature	Std
●	Coolant Level	Std
●	Fuel Pressure	Std
●	Engine Speed	Std
●	Battery Voltage	Std
●	Frequency	Std
●	Isochronous Governor Control	Std
●	-40deg C - 70deg C Operation	Std
●	Waterproof Plug-In Connectors	Std
●	Audible Alarms and Shutdowns	Std
●	Not in Auto (Flashing Light)	Std
●	Auto/Off/Manual Switch	Std
●	E-Stop (Red Mushroom-Type)	Std
●	NFPA 110 Level I and II (Programmable)	Std
●	Remote Communication - RS232	Std

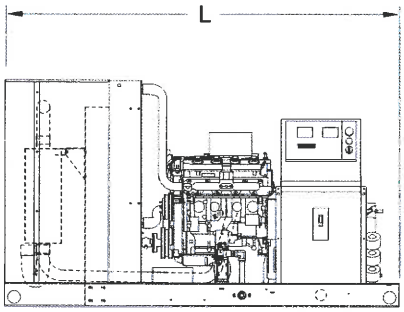
Alarms (Programmable Tolerances, Pre-Alarms and Shutdowns)

●	Low Fuel Pressure	Std
●	Oil Pressure (Pre-programmed Low Pressure Shutdown)	Std
●	Coolant Temperature (Pre-programmed High Temp Shutdown)	Std
●	Coolant Level (Pre-programmed Low Level Shutdown)	Std
●	Engine Speed (Pre-programmed Overspeed Shutdown)	Std
●	Voltage (Pre-programmed Overvoltage Shutdown)	Std
●	Battery Voltage	Std

QT025A

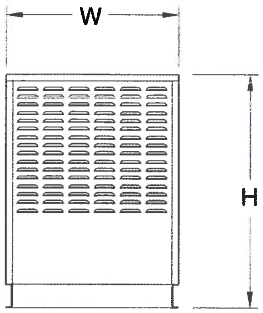
dimensions, weights and sound levels

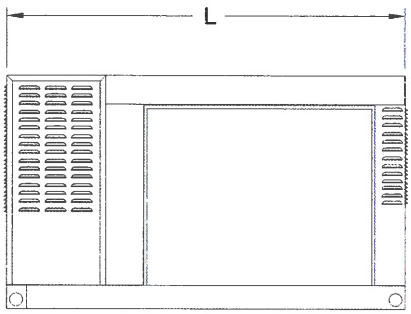




OPEN SET

L	W	H	WT	dBA*
77	34	43	1163	83





LEVEL 1 ACOUSTIC ENCLOSURE

L	W	H	WT	dBA*
77	34	46	1414	60

*All measurements are approximate and *All measurements are approximate and for estimation purposes only. Sound levels measured at 23ft (7m) under normal operation and do not account for ambient site conditions. estimation purposes only. Sound levels measured at 23ft (7m) and does not account for ambient site conditions.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

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Pumping Station - System Curve Calcs

Project Name:	248 TIORONDA AVE	**Designer:**	APB
Project Number:	81750.00	**DATE:**	June 27, 2019

************FLOW DATA************

Design Flow (GPD) =	12,592	gpd
Design Operation Time (Hours per day) =	18	hrs/day
Avg Flow Rate (Design Flow/Design Time *60) =	11.7	gpm
Peaking Factor (average range 2 - 4) =	4.00	
Peak Flow =	46.6	gpm

********* SYSTEM HEAD CURVE *********

Force Main Length + Equiv. Length, (L), Ft =	357	Highest Static Elev =	90.00
Nominal Size of Force Main in Inches =	2	PS Outlet Elev =	62.64
Actual ID of Force Main, (D) in Inches =	2.00	PS Inlet Elev =	58.27
Type of Force Main =	PVC	Lag Pump on =	57.77
C Value =	150	High Alarm =	57.77
Static Head (Hs) in Feet =	34.23	Lead Pump on =	57.27
		Pumps Off - Low Water Elev =	55.77
Lowest Pump Flow Rate, in GPM =	0	Low Level Alarm =	53.27
Incremental Increase, in GPM =	5		
		FM length =	340
Hazen Williams Equation		Fittings Equiv length (Table 1) =	17
Hf=(L*10.44*Q^1.85)/((D^4.87)*C^1.85)			
TDH=Hs+Hf		High Ground Water Elev =	71.00
V=.40853*Q/D^2		PS Top Elev =	71.00
Hv=V^2/2g		PS Bottom Elev =	52.27
Pump Data:	SULZER ABS PIRANHA S30/2D DUPLEX	PS Depth =	18.73

Flow Rate Q, GPM	Friction Head Hf, Feet	Static Head Hs, Feet	Total Dynamic Head TDH, Feet	Velocity FPS	Velocity Head Hv, Feet	Pump Curve Ft of Head	Parallel Curve Ft of Head	Duty Point
0	0.0	34.2	34.2	0.0	0.0	136.0	136.0	
5	0.2	34.2	34.5	0.5	0.0	129.0		
10	0.8	34.2	35.1	1.0	0.0	122.0	129.0	
15	1.8	34.2	36.0	1.5	0.0	120.0		
20	3.1	34.2	37.3	2.0	0.1	114.0	122.0	
25	4.6	34.2	38.9	2.6	0.1	110.0		
30	6.5	34.2	40.7	3.1	0.1	106.0	120.0	
35	8.6	34.2	42.9	3.6	0.2	102.0		
40	11.0	34.2	45.3	4.1	0.3	98.0	114.0	
45	13.7	34.2	48.0	4.6	0.3	94.0		
50	16.7	34.2	50.9	5.1	0.4	91.0	110.0	**67.2 GPM**
55	19.9	34.2	54.1	5.6	0.5	88.0		**63.1 TDH**
60	23.4	34.2	57.6	6.1	0.6	80.0	106.0	**6.9 FPS**
65	27.1	34.2	61.3	6.6	0.7	71.0		
70	31.1	34.2	65.3	7.1	0.8	53.0	102.0	
75	35.3	34.2	69.5	7.7	0.9	25.0		
80	39.8	34.2	74.0	8.2	1.0	0.0	98.0	
85	44.5	34.2	78.7	8.7	1.2	0.0		
90	49.5	34.2	83.7	9.2	1.3	0.0	94.0	
95	54.7	34.2	88.9	9.7	1.5	0.0		
100	60.1	34.2	94.4	10.2	1.6	0.0	91.0	

Pump Cycle Time

Project Name:	**248 TIORONDA AVE**	**Designer:**	**APB**
Project Number:	**81750.00**	**DATE:**	**June 27, 2019**

PS Inlet Elev =	**58.27** ft	
High Water Alarm =	**57.77** ft	
Lag Pump On =	**57.77** ft	
Lead Pump On =	**57.27** ft	
(All Pumps Off) Low Water Elev =	**55.77** ft	

Qin (min cycle time)=	**33.6**	gpm	min cycle time is when Q(in) = 1/2 Q(out)
Qin (avg day)=	**11.7**	gpm	Existing Flow + Future Flow
Qin (max day)=	**46.6**	gpm	
Q out =	**67.2**	gpm	Pump Duty Point from System Curve Calcs

Volume of Wet Well:

Wet well is round, yes / no	**Yes**
Wet Well Inside Dia. (ft) =	**6**

	Volume (Gal)	Water Depth (ft)	
(Operating Volume)	**317.2**	**1.50**	Between Lead Pump On & Pumps Off
	423.0	**2.00**	Between High Water Alarm & Pumps Off
	423.0	**2.00**	Between Lag Pump On & Pumps Off
	528.7	**2.50**	Between Pump Sta Inlet & Pumps Off
(Storage above High Water Alarm)	**105.7**	**0.50**	Between Pump Sta Inlet & High Water Alarm
(Storage above Operating Range)	**211.5**	**1.00**	Between Lead Pump on & Pump Sta Inlet

Drawdown Calculation:

For Qin=1/2Qout Flow=	**9.44** min.
For Average Day Flow=	**5.71** min.
For Maximum Day Flow=	**15.43** min.

Fill Time Calculations:

For Qin=1/2Qout Flow=	**9.44** min.
For Average Day Flow=	**27.21** min.
For Maximum Day Flow=	**6.80** min.

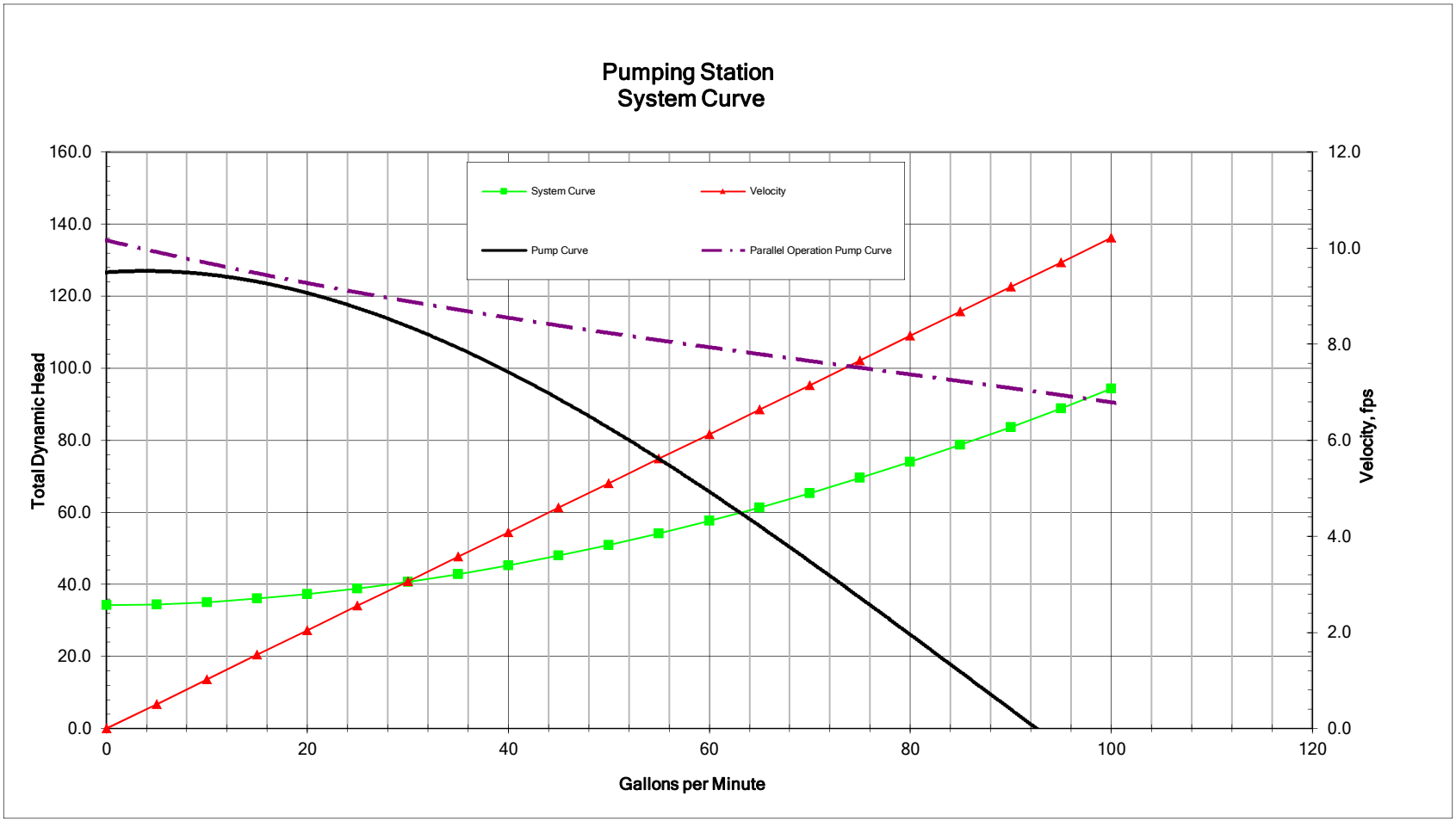
(Design Average Flow Fill Time < 30 min. - OK)

Cycle Time Calculation:

Cycle Time = $\frac{V}{Qo-Qi} + \frac{V}{Qi}$ = **18.88** min or **3.2** per hour
Min (Qin = 1/2 Qout) **(Minimum Cycle Time > 5 min. - OK)**
one pump running

Cycle Time = $\frac{V}{Qo-Qi} + \frac{V}{Qi}$ = **32.92** min or **1.8** per hour
Avg Day flow
one pump running

Cycle Time = $\frac{V}{Qo-Qi} + \frac{V}{Qi}$ = **22.23** min or **2.7** per hour
Max Day flow
one pump running


Pumping Station
System Curve
System Curve
Velocity
Pump Curve
Parallel Operation Pump Curve
Total Dynamic Head
Velocity, fps
Gallons per Minute
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0
20
40
60
80
100
120

Buoyancy Calculations

Project Name:	**248 TIORONDA AVE**	**Designer:**	**APB**
Project Number:	**81750.00**	**DATE:**	**June 27, 2019**

A) *Assumptions:*

- Water table elev. 71 If water table elev is unknown assume to be 1 ft below finished surface elev.
- Safety factor of 1.5 against flotation desired
- Up-lift force is the buoyant force on any body and is equal to the weight of fluid displaced by a submerged body
- The soil frictional force resisting up-lift is not taken into account in the calculations
- Material Unit weights:

Concrete	150	pcf (lbs per cubic feet)
Water	62.4	pcf
Saturated Soil	70.5	pcf

			Width (ft)	Length (ft)
wet well is round, yes / no	Yes			
Wet Well Inside Diameter (ft) =	6	Wet Well Inside Dimensions =	0	0

B) *Pump Station Structure Dimensions:*

Pump Station	Inside Diameter (Feet)	Wall Thickness (FT)	Outside Diameter (Feet)	Wall Height / Slab Thickness (FT)	Top Slab opening (SF)	Vol. of Concrete (CF)
Pump Chamber	6	0.5	7.00	18.73		191.24
Bottom Slab	6	0.67	7.34	0.67		28.35
Bottom Slab Ext.		1	9.34	0.67		17.55
					Total	237.14

C) *Up-lift Force (Buoyant Force):*

Buoyant Force = Volume of Water Displaced by Pump Station (cf) x Unit Weight of Water (62.4 pcf)

Pump Station	Depth of Water Displaced (feet)	Inside Dia (feet)	Wall Thickness (feet)	Outside Diameter (feet)	Volume (cf)
Chamber	18.73	6.00	0.50	7.00	720.81
Bottom Slab	0.67	6.00	0.67	9.34	45.90
				TOTAL:	766.72

		(cf)		(pcf)		
Buoyant Force	**=**	**766.72**	**X**	**62.4**	=	**47,843 lbs**

Buoyancy Calculations

Project Name:	**248 TIORONDA AVE**	**Designer:**	**APB**
Project Number:	**81750.00**	**DATE:**	**June 27, 2019**

C) Down Force:

Down Force = Weight of Concrete Chamber (lbs) + Weight of Soil Above Conc. Base Extension

Weight of Concrete Pump Station:

Pump Station	Vol. of Concrete (CF)	Weight of Concrete (lbs)
Wall Section	191.24	28,685
Bottom Slab	28.35	4,253
Total	237.14	35,571

* subtracted access door opening

	(cf)		(pcf)		
Weight of Concrete =	**237.14**	**X**	**150**	=	**35,571 lbs**

Weight of Soil Above Base Extension:

Soil Column above base extension	Width (feet)	Diameter (feet)		Height (feet)	Length (feet)	Volume (cf)
	1.0	9.3		18.73	29.34	549.58

	(cf)		(pcf)		
Weight of soil =	**549.58**	**X**	**70.5**	=	**38,746 lbs**

Total Downward Force =	**35,571**	**+**	**38,745.7**	=	**74,317 lbs**

D) Safety Factor against Flotation

S.F. = Down Force = **74,317**
Up-Lift Force = **47,843**

S.F. = **1.55** **No Additional Anti-flotation Measures Required**

This table shows equivalent pipe lengths for common fittings for use in calculating friction losses.
Source: *Cameron Hydraulic Data*, Nineteenth Edition

Minor Loss Values, equiv. feet

		Diameter, inches													
	FITTINGS	**1**	**1.5**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**
	90° Elbow	2.6	4.0	5.2	7.7	10.1	15.2	20.0	25.1	29.8	32.8	37.5	42.2	47.0	56.6
	45° Elbow	1.4	2.2	2.8	4.1	5.4	8.1	10.6	13.4	15.9	17.5	20.0	22.5	25.1	30.2
	Tee, thru flow	1.8	2.7	3.5	5.1	6.7	10.1	13.3	16.7	19.9	21.8	25.0	28.1	31.4	37.7
	Tee, branch flow	5.3	8.1	10.3	15.3	20.1	30.3	39.9	50.1	59.7	65.6	75.0	84.4	94.1	113.0
	Gate Valve, Full Open	0.7	1.1	1.4	2.0	2.7	4.0	5.3	6.7	8.0	8.8	10.0	16.9	12.5	15.1
	Swing Check Valve	8.7	13.4	17.2	25.5	33.6	50.5	33.3	41.8	49.7	54.7	62.5	70.3	78.4	94.3
	Angle Valve	13.1	20.1	25.8	38.4	50.3	75.8	99.8	125.0	149.0	164.0	188.0	210.0	235.0	283.0
	Globe Valve	29.7	45.6	58.6	86.9	114.0	172.0	226.0	284.0	338.0	372.0	425.0	478.0	533.0	641.0
	Butterfly Valve			7.8	11.5	15.1	22.7	29.9	29.2	34.8	38.3	31.3	35.2	39.2	47.1
Quantity															
0	90° Elbow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	45° Elbow	8.4	12.9	16.6	24.5	32.2	48.5	63.6	80.4	95.4	105.0	120.0	135.0	150.6	181.2
0	Tee, thru flow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Tee, branch flow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Gate Valve, Full Open	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Swing Check Valve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Angle Valve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Globe Valve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	Butterfly Valve			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total, feet	**8.4**	**12.9**	**16.6**	**24.5**	**32.2**	**48.5**	**63.6**	**80.4**	**95.4**	**105.0**	**120.0**	**135.0**	**150.6**	**181.2**

Appendix C:
Letter from DCDOH
Miscellaneous Documentation for DCDOH

MARCUS J. MOLINARO
COUNTY EXECUTIVE

KARI REIBER, MD
ACTING COMMISSIONER

COUNTY OF DUTCHESS
DEPARTMENT OF HEALTH

January 14, 2014

RECEIVED
JAN 21 2014
LANC & TULLY P.C.

Honorable Randy Casale
Office of the Mayor
One Municipal Center
Beacon, New York 12508

Re: Beacon 248 Tioronda Development
Tax Map No.: 30-5954-16-993482, City of Beacon

Honorable Mayor Casale:

This Department has recently received a revised sewer capacity analysis prepared by Thomas Newman, P.E. of Henningson, Durham & Richardson Architecture to support the above referenced project. The analysis uses a two year and a 17 year storm event.

The analysis concludes that with the South Avenue pipe upsized to 12" (from 8"), the maximum water levels with the proposed 248 Tioronda development will be lower than the existing condition along the South Avenue sewer and nearly unchanged in the South Interceptor; that no sewer backups are anticipated in the existing sewer service lines; that I/I reduction estimates for Beacon so far are 687,000 gallons per day for the 2 year storm event and 1,036,000 gallons per day for the 17 year storm event. The project average day flow is 22,800 gallons per day.

Per conversation with Tanya Clark, P.E. supervising public Health Engineer, this Department feels that it has been demonstrated that sufficient capacity exists in the existing sewer infrastructure to handle this project with the South Avenue pipe upsized to 12" (from 8") with the understanding that the City of Beacon will continue to meet the requirements of the consent order relative to I&I reductions and will conduct a study to identify various methods to reduce/eliminate existing sewage collection system surcharges.

The applicant may submit detailed engineered plans to this Department for approval of the proposed drinking water and sewer infrastructure. Please continue to work closely with this office relative to the approval of future projects. I may be reached at (845) 486-3404.

Regards,

Marie-Pierre Brulé, P.E.
Senior Public Health Engineer
Environmental Health Services

cc: John Russo, P.E. Lanc & Tully Engineering and Surveying, P.C., 3132 Route 207, Campbell Hall, NY 10916
Thomas Newman, P.E., 1200 MacArthur Blvd., Mahwah, NJ 07430
City of Beacon Planning Board, One Municipal Center, Beacon, New York 12508
Joseph M. Kowalczyk, Esq., Environmental Protection Bureau, Office of the Attorney General, The Capitol, Albany, New York 12224
Vijay Gandhi, NYSDEC, 21 South Putt Corners Road, New Paltz, New York 12561
Beacon District Office
File 30-233-40793

RESOLUTION

PLANNING BOARD
BEACON, NEW YORK

SITE PLAN APPROVAL FOR BEACON 248 DEVELOPMENT, LLC

WHEREAS, the Beacon Planning Board is entertaining an application for Site Plan Approval from Beacon 248 Development, LLC (the "Applicant" and "Owner") for the project known as Beacon 248 Development (the "Project" or "Proposed Action"); and

WHEREAS, for the purposes of the New York State Environmental Quality Review Act (SEQRA), the Proposed Action also includes Preliminary and Final Subdivision Plat Approvals (lot consolidation) and a Local Waterfront Revitalization Program (LWRP) Consistency Determination regarding the Project; and

WHEREAS, the Project site is located at 248 Tioronda Avenue, between Fishkill Creek and the railroad, on tax parcels 5954-16-993482 and 6054-45-012574 (the "Site" or "Subject Property"); and

WHEREAS the Site is approximately 9.16 acres in size and is located in the Fishkill Creek Development (FCD) District; and

WHEREAS, the overall Project is shown on the following drawings, generally entitled "Beacon 248 Development, LLC," prepared by The Chazen Companies:

1. Sheet No. T1, 1 of 17, "Title Sheet," last revised December 23, 2014;
2. Sheet No. SP1, 2 of 17, "Existing Conditions," last revised November 22, 2013;
3. Sheet No. SP2, 3 of 17, "Site Plan," last revised December 23, 2014;
4. Sheet No. SP3, 4 of 17, "Grading & Drainage Plan," last revised December 23, 2014;
5. Sheet No. SP4, 5 of 17, "Vehicle Maneuvering Plan," last revised December 23, 2014;
6. Sheet No. SP5, 6 of 17, "Utility Plan," last revised December 23, 2014;
7. Sheet No. SP6, 7 of 17, "Construction Phasing and Erosion & Sediment Plan: Phase 1," last revised December 23, 2014;
8. Sheet No. SP7, 8 of 17, "Construction Phasing and Erosion & Sediment Plan: Phase 2," last revised December 23, 2014;
9. Sheet No. LS1, 9 of 17, "Landscape Plan," last revised December 23, 2014;
10. Sheet No. LT1, 10 of 17, "Lighting Plan," last revised December 23, 2014;
11. Sheet No. SD1, 11 of 17, "Site Details," last revised December 23, 2014;
12. Sheet No. SD2, 12 of 17, "Sanitary Sewer System Details," last revised December 23, 2014;
13. Sheet No. SD3, 13 of 17, "Water System Details," last revised December 23, 2014;
14. Sheet No. SD4, 14 of 17, "Stormwater Sewer Details," last revised December 23, 2014;
15. Sheet No. SD5, 15 of 17, "Erosion and Sediment Control Details & Notes," last revised December 23, 2014;
16. Sheet No. PP1, 16 of 17, "Roadway Profile," last revised December 23, 2014;

17. Sheet No. PP2, 17 of 17, "Sanitary Sewer and Water Profiles," last revised December 23, 2014 (the seventeen (17) drawings above constitute the "Site Plan Drawings"); and

WHEREAS, the Site Plan Drawings also include two color-rendered architectural drawings generally entitled "Beacon 248 Development, LLC" prepared by Liscum McCormack Vanvoorhis and dated 12/12/14, which drawings show the East, West, North and South Elevations of Buildings 100, 200, 300 and 400, the Clubhouse and the Pavilion, with an additional sheet showing the floor plans for Buildings 100, 200, 300 and 400; and

WHEREAS, the Project consists of one hundred (100) two-bedroom units within four (4) buildings and a twelve hundred (1,200)-square foot clubhouse and a pool for its residents, as well as roads, parking areas, landscaping, lighting and other improvements and amenities as more specifically set forth in plans, visual representations, and application documents prepared by The Chazen Companies and submitted in support of the application; and

WHEREAS, after performing a coordinated determination of Lead Agency procedure in accordance with the New York State Environmental Quality Review Act (SEQRA) the Planning Board became the Lead Agency with respect to the Proposed Action; and

WHEREAS, on April 8, 2014, after taking a "hard look" at the Full Environmental Assessment Form and all of the associated materials prepared in connection with the Proposed Action, the Planning Board, as Lead Agency, adopted a Negative Declaration regarding the Proposed Action; and

WHEREAS, the Site is located in the Coastal Management Zone as defined by the City's LWRP; and

WHEREAS, on April 8, 2014, the Planning Board issued an LWRP Consistency Determination finding the Project to be consistent with the objectives of the City's LWRP; and

WHEREAS, on August 4, 2014, the City Council granted Concept Plan and Special Permit Approvals to the Project; and

WHEREAS, the application was referred to the Dutchess County Department of Planning and Development in accordance with Sections 239-l and m of the General Municipal Law, and said department responded to said referral by way of its correspondence dated December 4, 2014 and had no comments regarding the Project; and

WHEREAS, on December 9, 2014 and January 13, 2015, the Planning Board held a public hearing on the applications for Site Plan and Preliminary Subdivision Plat Approvals, at which time all those interested were given an opportunity to be heard, and the public hearing was closed on January 13, 2015; and

WHEREAS, the Planning Board approved the aforementioned Preliminary and Final Subdivision Plat applications by resolution adopted on January 13, 2015; and

WHEREAS, the Applicant is providing a Greenway Trail in accordance with the recommendations of the Fishkill Creek Greenway & Heritage Trail Master Plan; and

WHEREAS, the Project will be in full compliance with Article IVB, Affordable-Workforce Housing, of the City's Zoning Law; and

WHEREAS, the Planning Board is fully familiar with the Project and has reviewed the Project relative to all applicable provisions of the City Code.

NOW, THEREFORE, BE IT RESOLVED, that the Planning Board hereby grants Site Plan Approval to the Project, as shown on the Site Plan Drawings and other application materials enumerated above, subject to compliance with the following conditions and any other requirements which must be met by law:

A. Prior to the signing of the Site Plan Drawings by the Planning Board Chairman, the following conditions shall be fulfilled to the satisfaction of the Planning Board:

1. The comments contained in the City Engineer's letter to the Planning Board dated January 9, 2015, and all comments in any subsequent letter(s) issued, shall be fulfilled to the satisfaction of the City Engineer.

2. The Site Plan Drawings shall be modified to the satisfaction of the City Planner as follows:

    a. The proposed bike rack adjacent to the clubhouse has been shown on the site plan drawings. However, the bike rack shall be labeled.

    b. The final approved version of the Construction Sequence Schedule and narrative shall be included on the Site Plan Drawings.

    c. On the central gable feature and facade extending from the first to the third story of the East and West Elevations of Buildings 100 and 300 on the above specified architectural drawings dated 12/12/14,

the brown color shall be changed to the green color shown on these facades, and the drawing shall be modified accordingly.

3. The Applicant shall seek and obtain all required permits and/or approvals from the appropriate agencies for the Project, including but not necessarily limited to approval from the Dutchess County Department of Health, and shall meet all conditions contained in such approvals, as required therein.

When the conditions above have been satisfied, six (6) sets of the above referenced plans revised as per the conditions above shall be submitted for endorsement by the Planning Board Chairman. One set of the endorsed plans will be returned to the Applicant, one set will be retained by the City Clerk, one set will be provided to the Planning Board, and one set each will be forwarded to the Building Inspector, City Engineer and City Planner.

B. Prior to commencement of any site work for the Project, the Applicant must obtain Final Subdivision Plat Approval from the Planning Board for the subject lot consolidation, shall fulfill all of the conditions thereof and shall file same in the Dutchess County Clerk's Office.

C. Prior to commencement of any site work for the Project, the Applicant shall fund an escrow account with the City of Beacon for the construction observation and monthly stormwater inspections of the proposed utilities and site improvements in an amount as determined by the City Engineer.

D. Prior to issuance of the first Building Permit for the Project, the Applicant shall fund all costs associated with the design, engineering, surveying and inspection (i.e. all non-construction costs), and shall file a performance bond or letter of credit to secure all construction work and improvements to increase the size of the South Avenue sewer line from an eight (8) inch to a twelve (12) inch diameter, both in amounts as determined by the City Engineer.

E. Based on the current and anticipated future need for park and recreational opportunities in the City of Beacon, as set forth in the analysis provided by Frederick P. Clark Associates, Inc., and the demands of the future population of the Project, the Planning Board hereby finds that additional recreation/parkland should be created as a condition of approval. However, the Planning Board hereby determines that recreation/parkland of adequate size and location cannot be provided on the Project Site. Therefore, the Applicant shall pay a Recreation Fee as prescribed under Sections 223-25.H(4) and 223-61.A(7) of the Zoning Law. Notwithstanding the preceding sentence, the Planning Board further determines that the Greenway Trail and publicly accessible viewing platform, as well as the pavilion, pool area and club house, will partially address the need for additional recreation/parkland within the City. Therefore, the Recreation Fee shall be

proportionately offset by the recreation/parkland actually provided. Accordingly, the Planning Board determines that the Applicant shall be granted a 50% credit toward the payment of the total Recreation Fee for the Project.

The Planning Board hereby requires that, prior to the issuance of the respective Certificates of Occupancy for each building, the Applicant shall pay a Recreation Fee for the number of new dwelling units in that building in accordance with Sections 223-25.H(4) and 223-61.A(7) of the Zoning Law, as per the City's Fee Schedule in effect at the time of payment, with the Applicant being given a 50% credit toward the amount then owed.

F. Prior to the issuance of the first Certificate of Occupancy for Building 100, the Greenway Trail construction shall be completed. Prior to the issuance of the first Certificate of Occupancy for Building 400, the easement for the Greenway Trail, including the public parking and viewing pavilion, shall be dedicated to the City and the Greenway Trail, pavilion and parking shall be fully operational.

Notwithstanding the paragraph immediately above, in the case where construction of the Project ceases, and three (3) years has passed from the issuance of the Project's first Building Permit, the Greenway Trail shall be made fully operational and open to the public, at the City's request, until such time as Project construction resumes. In this case, access shall be along the Greenway Trail, and not through the Site from Tioronda Avenue or Wolcott Avenue, and shall not include use of the public parking area or viewing pavilion in order to ensure that the public does not have access to the partially constructed site. Such temporary access shall in no way limit the obligation that the Greenway Trail, public parking and viewing pavilion shall be fully operational prior to the issuance of the first Certificate of Occupancy for Building 400. Use of the Greenway Trail, public parking and pavilion may be restricted in whole or in part, as necessary to protect public safety, during periods of construction.

Notwithstanding the preceding paragraph, the Applicant shall not be required to provide the temporary access to the Greenway Trail, as described above, and temporary access previously granted shall cease, if construction ceases or fails to resume due to the City's refusal to extend or renew the Special Permit or Site Plan Approval, unless such refusal is based upon Applicant's failure to timely or properly comply with a provision of the City Code or a condition of the Special Permit or this Site Plan Approval.

G. With respect to the improvements to increase the size of the South Avenue sewer line from an eight (8) inch to a twelve (12) inch diameter, such work shall be performed by the City, at its discretion, or by the Applicant, and such work shall be completed and satisfactorily inspected prior to the issuance of the first

Certificate of Occupancy for Building 100, or at such earlier time as may be required by the Dutchess County Department of Health.

H. The following are general conditions which shall be fulfilled:

1. The Project shall be constructed in accordance with the final approved version of the Construction Sequence Schedule and narrative.

2. Construction vehicles shall not access Wolcott Avenue except as authorized by the Building Department. The Wolcott Avenue access shall be gated, with the gate being closed each evening and opened each morning. The Building Department shall have the authority to require the Applicant to hire flagmen, at Applicant's sole cost and expense, and to implement any other appropriate methods of traffic control, including signage, at said access point and also at Applicant's sole cost and expense. The use of the Wolcott Avenue access shall be at the sole discretion of the Building Department and can be revoked at any time.

3. License to enter the City of Beacon right-of-way to construct any access improvements shall be obtained prior to any work in the right-of-way.

4. The Building Inspector and the City Engineer shall have the right to direct the Applicant to cause the placement, cleaning and/or repair of sedimentation and erosion control devices wherever and whenever deemed necessary during construction.

5. The Applicant shall keep the Greenway Trail in a safe and usable condition and shall be restored to its original condition after significant storm events and flooding (as determined by the Building Inspector), and/or any damage to the trail. The Greenway Trail shall be inspected once a year and after significant storm events.

6. As recommended by the Fishkill Creek Greenway & Heritage Trail Master Plan, the Greenway Trail shall be open to the public from dawn to dusk.

7. Conditions H5 and H6 shall remain in full force and effect until the City of Beacon adopts uniform standards for the use, maintenance and repair of the City's Greenway Trail System, which standards shall supersede Conditions H5 and H6.

8. The Project shall comply in all respects with Article IVB, Affordable-Workforce Housing, of the Zoning Law. The Applicant shall be responsible for the payment of any and all fees established by the City Council now or

in the future or as otherwise required for the ongoing implementation of the provisions of Article IVB, Affordable-Workforce Housing, of the Zoning Law as said Article applies to the Project.

9. This approval is conditioned upon compliance with all of the mitigation measures specified in the Applicant's Environmental Assessment Form (EAF). The Applicant shall be responsible for the funding and/or implementation of all such identified mitigation measures. Where the terms of this resolution may be inconsistent with the EAF, the terms of this resolution shall be controlling.

10. The Applicant shall be responsible for the payment of all application review costs incurred by the City in its review and approval of this project. Such fees shall be paid by the Applicant within thirty (30) days of each notification by the City that such fees are due. If such fees are not paid within the thirty (30) day period, and an extension therefor has not been granted by the City, this resolution shall be rendered null and void.

11. As used herein, the term "Applicant" shall include Beacon 248 Development, LLC and its heirs, successors and assigns, and where applicable its contractors and employees.

12. If any of the conditions enumerated in this resolution upon which this approval is granted are found to be invalid or unenforceable, then the integrity of this resolution and the remaining conditions shall remain valid and intact.

13. The approvals granted by this resolution do not supersede the authority of any other entity.

14. The continued validity of this Site Plan Approval is dependent upon the validity of the Project's Special Permit. In accordance with Section 223-41.13F(4) of the Zoning Law, Special Permit Approval shall expire if:

    a. A bona fide application for a Building Permit is not filed within one (1) year of the date of the adoption of this Resolution granting Site Plan Approval; or

    b. If all required improvements are not made within two (2) years from the date of issuance of the Building Permit; or

    c. If said uses cease for more than six (6) months for any reason.

The City Council may, in its discretion, extend any time period it has previously set where it finds that changing market conditions or other circumstances have acted to prevent the timely commencement or completion of work, and that the developer has proceeded with reasonable diligence in an effort to assure completion of the work within the permitted time period. The extension of these time periods shall not require the holding of a new public hearing.

15. The Applicant must return for approval from the Planning Board if any changes to the endorsed plans and/or this resolution of approval are subsequently desired.

Resolution Adopted: January 13, 2015
Beacon, New York

Jay Sheers, Chairman

January 19, 2015
Date

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RESOLUTION

PLANNING BOARD
BEACON, NEW YORK

PRELIMINARY AND FINAL SUBDIVISION
PLAT APPROVALS FOR BEACON 248 DEVELOPMENT, LLC

WHEREAS, the Beacon Planning Board is entertaining applications for Preliminary and Final Subdivision Plat Approval from Beacon 248 Development, LLC (the "Applicant" and "Owner") for the project known as Beacon 248 Development (the "Project" or "Proposed Action"); and

WHEREAS, for the purposes of the New York State Environmental Quality Review Act (SEQRA), the Proposed Action also includes Site Plan Approval and an Local Waterfront Revitalization Program (LWRP) Consistency Determination regarding the Beacon 248 Development; and

WHEREAS, the Project site is located at 248 Tioronda Avenue, between Fishkill Creek and the railroad, on tax parcels 5954-16-993482 and 6054-45-012574 (the "Site" or "Subject Property"); and

WHEREAS the Site is approximately 9.16 acres in size and is located in the Fishkill Creek Development (FCD) District; and

WHEREAS, the Applicant is proposing the resubdivision of two (2) parcels into one (1) parcel; and

WHEREAS, the subdivision is shown on Sheet No. P1, entitled "Beacon 248 Development, LLC, Preliminary Subdivision Plat," prepared by The Chazen Companies, dated December 23, 2014 (the "Preliminary Subdivision Plat" and the "Final Subdivision Plat"); and

WHEREAS, the Project consists of one hundred (100) two-bedroom units within four (4) buildings and a twelve hundred (1,200)-square foot clubhouse and a pool for its residents, as well as roads, parking areas, landscaping, lighting and other improvements and amenities as more specifically set forth in plans, visual representations and application documents prepared by The Chazen Companies and submitted in support of the application; and

WHEREAS, after performing a coordinated determination of Lead Agency procedure in accordance with the New York State Environmental Quality Review Act

(SEQRA) the Planning Board became the Lead Agency with respect to the Proposed Action; and

WHEREAS, on April 8, 2014, after taking a "hard look" at the Full Environmental Assessment Form and all of the associated materials prepared in connection with the Proposed Action, the Planning Board, as Lead Agency, adopted a Negative Declaration regarding the Proposed Action; and

WHEREAS, the Site is located in the Coastal Management Zone as defined by the City's LWRP; and

WHEREAS, on April 8, 2014, the Planning Board issued a LWRP Consistency Determination finding the Project to be consistent with the objectives of the City's LWRP; and

WHEREAS, the application was referred to the Dutchess County Department of Planning and Development in accordance with Sections 239-l and m of the General Municipal Law, and said department responded to said referral by way of its correspondence dated December 4, 2014 and had no comments regarding the Project; and

WHEREAS, on December 9, 2014 and January 13, 2015, the Planning Board held a public hearing on the applications for Site Plan and Preliminary Subdivision Plat Approvals, at which time all those interested were given an opportunity to be heard, and the public hearing was closed on January 13, 2015; and

WHEREAS, the Planning Board is fully familiar with the Project and has reviewed the Project relative to all applicable provisions of the City Code.

NOW THEREFORE BE IT RESOLVED, that the Planning Board hereby grants Preliminary Subdivision Plat Approval to the Project, as shown on the application materials noted above; and

BE IT FURTHER RESOLVED, that the Planning Board hereby finds that the Final Subdivision Plat will not be substantively changed from the Preliminary Subdivision Plat and hereby determines that a public hearing on the Final Plat is not required; and

BE IT FURTHER RESOLVED, that the Planning Board hereby grants Final Subdivision Plat Approval to the Project, as shown on the Final Subdivision Plat noted above, subject to the following conditions and modifications:

A. The following conditions shall be fulfilled prior to the signing of the Final Subdivision Plat by the Chairman of the Planning Board:

1. The comments contained in the City Engineer's letter to the Planning Board dated January 9, 2015, and all comments in any subsequent letter(s) issued, shall be fulfilled to the satisfaction of the City Engineer.

2. The Final Subdivision Plat shall be revised to the satisfaction of the City Planner and City Engineer as follows:

   a. To include all required information as contained in Section 195-27 of the City of Beacon Subdivision Regulations.

   b. To be entitled "Final Subdivision Plat."

   c. To include all existing and proposed easements. The existing Greenway Trail easement shall be labeled "To be extinguished."

   d. To include and carry forward all pertinent information on the most recently approved plat(s) for the Subject Property.

   e. To include a note that the subdivision is the consolidation of two (2) parcels.

4. The following conditions shall be fulfilled to the satisfaction of the City Attorney:

   a. The Access Easement(s) and Maintenance Agreement(s) for the Greenway Trail, the pavilion, and the designated public parking spaces for the Greenway Trail shall be prepared by the Applicant and approved by the City Attorney.

   b. The expanded Vehicular and Pedestrian Access Easement over the Metro-North Railroad for the project's main entrance/exit on Tioronda Avenue shall be prepared by the Applicant and approved by the City Attorney.

   c. The Vehicular Access Easement for the benefit of the Sisters Property over the Beacon 248 site to reach the Project's main entrance/exit on Tioronda Avenue, and the use of the Project's emergency access to Wolcott Avenue by the Sisters Property shall be prepared by the Applicant and approved by the City Attorney.

4. The Applicant shall seek and obtain all required permits and/or approvals from the appropriate agencies for the Project, including but not necessarily limited to approval from the Dutchess County Department of Health, and shall meet all conditions contained in such approvals.

5. All known application review fees shall be paid in full.

B. Prior to the issuance of the first Building Permit for the Project, the Applicant shall record all required deeds, easements and agreements, etc. affecting the Subject Property in the Dutchess County Clerk's Office and shall provide fully executed copies and proof of recording to the City Attorney.

C. The following are general conditions which shall be fulfilled:

1. This approval is conditioned upon compliance with all of the mitigation measures specified in the Applicant's Environmental Assessment Form (EAF). The Applicant shall be responsible for the funding and/or implementation of all such identified mitigation measures. Where the terms of this resolution may be inconsistent with the EAF, the terms of this resolution shall be controlling.

2. The Applicant shall be responsible for the payment of all application review costs incurred by the City in its review and approval of this project. Such fees shall be paid by the Applicant within thirty (30) days of each notification by the City that such fees are due. If such fees are not paid within the thirty (30) day period, and an extension therefor has not been granted by the City, this resolution shall be rendered null and void.

3. As used herein, the term "Applicant" shall include Beacon 248 Development, LLC and its heirs, successors and assigns, and where applicable its contractors and employees.

4. If any of the conditions enumerated in this resolution upon which this approval is granted are found to be invalid or unenforceable, then the integrity of this resolution and the remaining conditions shall remain valid and intact.

5. The approvals granted by this resolution do not supersede the authority of any other entity.

6. Conditional approval of the Final Subdivision Plat shall expire one hundred eighty (180) days from the date of the adoption of this resolution unless all items in Condition A above have been certified as completed and the Final Plat has been submitted for endorsement by the Planning Board Chairman, or unless a written request for an extension of Final Subdivision Plat Approval is granted. The Planning Board may, in its discretion, grant ninety (90) day extensions to said time period upon written request by the Applicant submitted prior to expiration of the Final Subdivision Plat approval.

7. Once the Final Subdivision Plat has been endorsed by the Planning Board Chairman, said plat must be filed in the Dutchess County Clerk's Office within sixty-two (62) days. After said filing, two (2) copies of the Final Plat certified by Dutchess County, shall be submitted to the Planning Board Secretary. One (1) certified copy of the Final Plat shall be retained by the Planning Board and the other certified copy shall be transmitted to the City Clerk along with a signed copy of this resolution.

8. The Applicant must return for approval from the Planning Board if any changes to the endorsed plans and/or this resolution of approval are subsequently desired.

Resolution Adopted: January 13, 2015
Beacon, New York

Jay Sheers

Jay Sheers, Chairman

January 19, 2015

Date

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LICENSE AGREEMENT FOR WIRE, PIPE AND CABLE TRANSVERSE CROSSINGS AND LONGITUDINAL OCCUPATIONS

THIS AGREEMENT, made this 30th day of June, 19 80, between CONSOLIDATED RAIL CORPORATION, a Pennsylvania Corporation party of the first part (hereinafter called "Railroad") and TUCK INDUSTRIES, INC., a New York Corporation, as party of the second part (hereinafter called "Licensee").

WITNESSETH, that the said Railroad (which when used herein shall include any lessor, successor or assignee of or operator over its railroad) insofar as it has the legal right and its present title permits, and in consideration of the covenants and conditions hereinafter stated on the part of the Licensee to be kept and performed, hereby permits, as a temporary license, the Licensee to construct, maintain, repair, alter, renew, relocate and ultimately remove one (1) 2-inch epoxy fiberglass forced industrial sewage pipe, encased in a 12-inch steel pipe, through the lands and under and across the roadway and tracks of Railroad (formerly held by Central New England Railroad) at Valuation Station 1986+10±, located 1732 feet north of Mile Post 12, at a point 0.20 of a mile north of the Station of Beacon, Dutchess County, New York.

Town 1499 - (Beacon Terminal Associates L.P.

in accordance with construction plans 1 (of 4) and 3
submitted by Licensee to and approved by the Chief Engineer of Railroad, incorporated herein by reference; also in accordance with current issues of Railroad Specifications Nos. CE 4 and/or CE 8; and shown on Plan No. T-351 , dated June 2, 1980 , marked Exhibit "A," attached hereto and made a part of this Agreement, all and any part thereof being hereafter referred to as the "FACILITIES"; said license, however, shall be under and subject to the following terms, covenants, and conditions as hereinafter recited, which are hereby accepted and agreed to, by the Licensee, to wit:

1. The Licensee shall pay to the Railroad upon the execution hereof, the sum of Three Hundred Dollars ($ 300.00) as reimbursement for the costs and expenses incident to the preparation of this Agreement, together with the further sum of Fifty Dollars ($ 50.00) per year as minimum annual rental, which said sum shall be payable annually in advance, commencing as of July 1 , 19 80 . Railroad reserves the right to make adjustments in these rental charges.

2. (a) The FACILITIES shall be located, constructed and maintained in exact accordance with said construction plans and for the purpose as outlined on Page 1. No departure shall be made at any time therefrom except upon permission in writing granted by the Chief Engineer of Railroad, or his designee, provided, however, that if any commission or other regulatory body duly constituted and appointed in compliance with the laws of the State in which the crossing or occupancy herein provided is situate, and having jurisdiction in the premises, has by ruling or other general order determined and fixed the manner and means of construction, maintenance, repair, alteration, renewal, relocation or removal thereof, then said ruling or general order shall prevail for the crossing or occupancy herein mentioned.

(b) The work of constructing, maintaining, repairing, altering, renewing, relocating or removing the said FACILITIES shall be done under such general conditions as will be satisfactory to and approved by the Chief Engineer of Railroad, or his designee, and as will not interfere with the proper and safe use, operation and enjoyment of the property of the Railroad. Licensee, at its own cost and expense, shall, when performing any work in connection with the FACILITIES, furnish any necessary inspectors, flagmen or watchmen to see that men, equipment, and materials are kept a safe distance away from the tracks of the Railroad.

(c) In addition to, but not in limitation of any of the foregoing provisions, if at any time the Railroad should deem inspectors, flagmen or watchmen desirable or necessary to protect its operations or property, or its employees, patrons or Licensees during the work of construction, maintenance, repair, alteration, renewal, relocation or removal of said FACILITIES of Licensee, the Railroad shall have the right to place such inspectors, flagmen or watchmen at the sole risk, cost and expense of Licensee, which covenants and agrees to bear the full cost and expense thereof and to promptly reimburse the Railroad upon demand. The furnishing or failure to furnish inspectors, flagmen or watchmen by the Railroad, however, shall not release the Licensee from any and all other liabilities assumed by the Licensee under the terms of this Agreement.

3. If the Licensee desires or is required, as herein provided, to revise, renew, add to or alter in any manner whatsoever the aforementioned FACILITIES, it shall submit plans to Railroad and obtain the written approval of the Chief Engineer of Railroad thereto before any work or alteration of the structure is performed and the terms and conditions of this Agreement with respect to the original construction shall apply thereto. Railroad reserves the right to make adjustments in the rental charges.

4. (a) The Licensee shall at all times be obligated to promptly maintain, repair and renew said FACILITIES; and shall, upon notice in writing from Railroad and requiring it so to do, promptly make such repairs and renewals thereto as may be required by Railroad; or the Railroad, for the purpose of protecting and safeguarding its property, traffic, patrons or employees from damage or injury, may with or without notice to the Licensee at any time make such repairs and renewals thereto and furnish such material therefor as it deems adequate and necessary, all at the sole cost and expense of Licensee.

(b) In the event of an emergency, Licensee will take immediate steps to perform any necessary repairs, and in the event Licensee fails so to do, Railroad will perform said necessary repairs at the sole cost and expense of Licensee.

5. (a) The supervision over the location of the construction work and inspection of the FACILITIES and the approval of the material used in construction, maintenance, repair, alteration, renewal, relocation and removal of the aforesaid FACILITIES covered by this Agreement shall be within the jurisdictional rights of the Railroad.

(b) The right of supervision over the location of the construction work and inspection of the FACILITIES from time to time thereafter by the Railroad, shall extend for an appropriate distance on each side of the property of the Railroad as the method of construction and materials used may have an important bearing upon the strength and stability of the FACILITIES over, under, upon, or in the property of the Railroad.

6. Licensee shall comply with all Federal, State and local laws, and assume all cost and expense and responsibility in connection therewith, without any liability whatsoever on the part of the Railroad.

7. (a) It is understood between the parties hereto that the operations of the Railroad at or near said FACILITIES involve some risk, and the Licensee as part of the consideration for this license hereby releases and waives any right to ask for or demand damages for or account of loss of or injury to the FACILITIES (and contents thereof) of the Licensee that are over, under, upon, or in the property and facilities of the Railroad including the loss of or interference with service or use thereof and whether attributable to the fault, failure or negligence of the Railroad or otherwise.

(b) And the Licensee also covenants and agrees to and shall at all times indemnify, protect and save harmless the Railroad from and against all cost or expense resulting from any and all losses, damages, detriments, suits, claims, demands, costs and charges which the said Railroad may directly or indirectly suffer, sustain or be subjected to by reason or on account of the construction, placement, attachment, presence, use, maintenance, repair, alteration, renewal, relocation or removal of said FACILITIES in, on, about or from the premises of Railroad whether such losses and damages be suffered or sustained by the Railroad directly or by its employees, patrons, or licensees, or be suffered or sustained by other persons or corporations, including the Licensee, its employees and agents who may seek to hold the Railroad liable therefor, and whether attributable to the fault, failure or negligence of the Railroad or otherwise, except when proved by Licensee to be due directly to the sole negligence of the Railroad.

(c) If a claim or action is made or brought against either party and for which the other party may be responsible hereunder in whole or in part, such other party shall be notified and permitted to participate in the handling or defense of such matter.

8. All cost and expenses in connection with the construction, maintenance, repair, alteration, renewal, relocation and removal of said FACILITIES shall be borne by the Licensee, and in the event of work being performed or material furnished by Railroad under the stipulated right to perform such work of construction, maintenance, repair, alteration, renewal, relocation or removal under any section hereof, Licensee agrees to pay to the Railroad the actual cost of material plus the current applicable overhead percentages for storage, handling, transportation, purchasing and other related material management expenses and the actual cost of labor plus the current applicable overhead percentages as developed and published by the accounting department of Railroad for fringe benefits, payroll taxes, administration, supervision, use of tools, machinery and other equipment, supplies, employers liability insurance, public liability insurance, and other insurance, taxes and all other indirect expenses. It is to be understood that the aforementioned material and labor overhead charges are to be applied at the rates which are effective at the time of the performance of any work by employees of the Railroad on the said FACILITIES. Licensee agrees to pay such bills within thirty (30) days of the presentation thereof by Railroad.

9. The Licensee shall, at its sole cost and expense, upon request in writing of the Railroad, promptly change the location of said FACILITIES covered by this Agreement, where located over, upon or in the property and facilities of the Railroad, to another location, to permit and accommodate changes of grade or alignment and improvement in or additions to the facilities of the Railroad upon land now or hereafter owned or used by the Railroad to the intent that said construction shall at all times comply with the terms and conditions of this Agreement with respect to the

original construction; or in the event of the lease, sale or disposal of the premises or any part thereof encumbered by this license, then the said Licensee shall make such adjustments or relocations in its facilities as are over, upon or in the property and facilities of the Railroad as may be required by the said Railroad or its grantee; and if the Licensee shall fail or refuse to comply therewith, then the duly authorized agents of the Railroad may make such repairs or adjustments or changes in location and provide necessary material therefor.

10. Upon termination of this Agreement or upon the removal or abandonment of the FACILITIES covered hereby, all the rights, title and interest of the Licensee hereunder shall cease and determine, and this instrument shall thereupon become and be null and void, without any liability on the part of either party to the other party except only as to any rentals and liability accrued prior thereto, and the Licensee shall remove its said FACILITIES and appurtenances from Railroad property, and right-of-way and all property of the Railroad shall be restored in good condition and to the satisfaction of the Railroad. If the Licensee fails or refuses to remove its FACILITIES and appurtenances under the foregoing conditions, the Railroad shall be privileged to do so at the cost and expense of the Licensee, and the Railroad shall not be liable in any manner to the Licensee for said removal.

11. In the event the FACILITIES consist of an underground occupation, Licensee will be responsible for any settlement caused to the roadbed, right of way and/or tracks, facilities, and appurtenances of the Railroad arising from or as a result of the installation of the said FACILITIES for a period of one (1) year subsequent to the date of completion of the installation, and Licensee agrees to pay to Railroad on demand the full cost and expense therefor.

12. In the event the said FACILITIES consist of electrical power or communication wires and/or appurtenances, the Licensee shall at all times be obligated promptly to remedy any inductive interference growing out of or resulting from the presence of its FACILITIES; and if the Licensee should fail so to do, then Railroad may do so, and the Licensee agrees to pay to Railroad on demand the full cost and expense therefor.

13. As part of the consideration of the within Agreement, Licensee covenants and agrees that no assessments, taxes or charges of any kind shall be made against Railroad or its property by reason of the construction of said FACILITIES of Licensee, and Licensee further covenants and agrees to pay to Railroad promptly upon bills rendered therefor the full amount of any assessments, taxes or charges of any kind which may be levied, charged, assessed or imposed against the Railroad or its property by reason of the construction and maintenance of said FACILITIES of Licensee.

14. The rights conferred hereby shall be the privilege of the Licensee only, and no assignment or transfer hereof shall be made, or other use be permitted than for the purpose stated on page one without the consent and agreement in writing of the Railroad being first had and obtained.

15. This Agreement with the rights granted may be terminated at any time by either party hereto upon not less than thirty (30) days' written notice to the other; and upon the expiration of the said thirty (30) days after service of such notice, this agreement and the permission and privilege hereby granted shall absolutely cease and terminate.

16. This Agreement shall take effect as of the First day of July A.D. 19 80 , subject to the provisions of Paragraph 17.

17. This Agreement will not become valid until the method of installation and all related matters have been approved by the Chief Engineer - Design and Construction of Railroad or his duly designated representative.

18. Automobile mileage charges incurred by aforementioned Railroad Inspectors, Flagmen or Watchmen in connection with the installation, maintenance, etc., of said facility will be based on allowances approved by The United States Government in effect at the time the expenses are incurred.

The terms of this Agreement shall be binding and effective upon all the parties hereto, and unless and until terminated, as hereinbefore provided, this Agreement shall inure to the benefit of and be binding upon the parties hereto, their successors and assigns, subject, however, to the provisions of Article 14 of this Agreement.

IN WITNESS WHEREOF, the said parties hereto have caused this Agreement to be duly executed and delivered as of the day and year first above written.

WITNESS:

CONSOLIDATED RAIL CORPORATION

BY R W Orr
R. W. Orr
Assistant Vice President-Contracts

WITNESS:

TUCK INDUSTRIES, INC.

BY James W Lynch, V.P.
Its Chief Financial Officer

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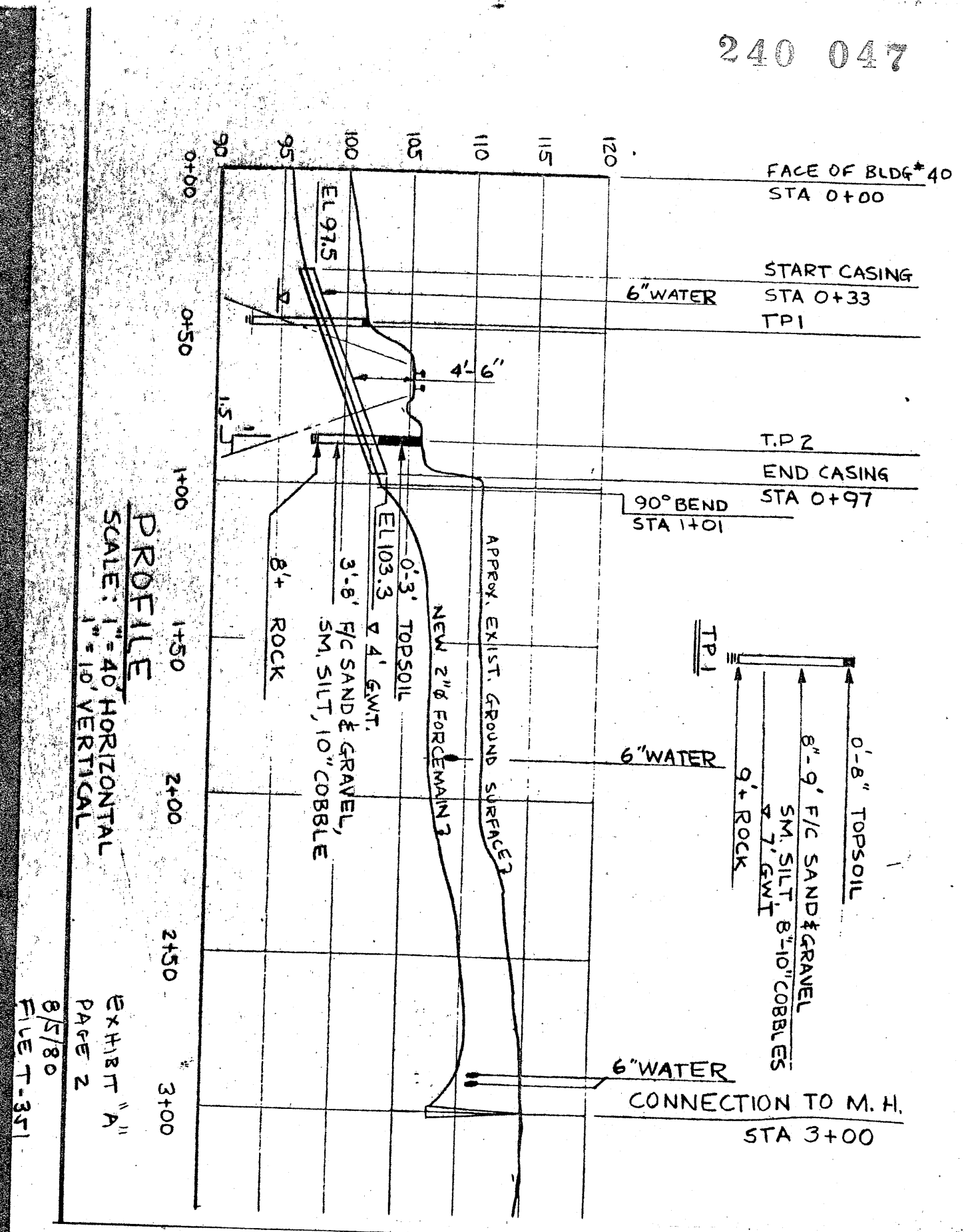
90
95
100
105
110
115
120
0+00
0+50
1+00
1+50
2+00
2+50
3+00
FACE OF BLDG* 40
STA 0+00
START CASING
STA 0+33
TP1
6"WATER
4'-6"
1.5
T.P 2
END CASING
STA 0+97
90° BEND
STA 1+01
EL 97.5
EL 103.3
8'+ ROCK
3'-8' F/C SAND & GRAVEL, SM, SILT, 10" COBBLE
0'-3' TOPSOIL
4' G.W.T.
APPROX. EXIST. GROUND SURFACE?
NEW 2"ø FORCEMAIN?
6"WATER
CONNECTION TO M.H.
STA 3+00
TP 1
0'-8" TOPSOIL
8"-9' F/C SAND & GRAVEL SM, SILT, 8"-10" COBBLES
7' G.W.T.
9'+ ROCK
6"WATER
PROFILE
SCALE: 1"=40' HORIZONTAL
1"=10' VERTICAL
EXHIBIT "A"
PAGE 2
8/5/80
FILE T-351