INSITE
ENGINEERING, SURVEYING &
LANDSCAPE ARCHITECTURE, P.C.

WASTEWATER ENGINEERING REPORT

For

Trailside Estates at Somers
Town of Somers, New York

October 23, 2025

Prepared By
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3 Garrett Place
Carmel, New York 10512

1.0 INTRODUCTION

The applicant, Parkview B & G, LLC is proposing to construct an 81-unit townhouse community and community center on two parcels totaling 56.8± acres in the Town of Somers. The townhouse units will consist of (58) three-bedroom units and (23) two-bedroom units. The community center will be dedicated to the Town of Somers. The tax parcels are identified as 4.20-1-12 and 15.08-1-4, located in the PH, R40 and R80 zoning districts. Access to the property is proposed through the Somers Realty Planned Hamlet via Reynolds Drive. The site is located on the south side of US Route 6 and between the Somers Realty Planned Hamlet and the North County Trailway.

A portion of the project is shown as being located in the Westchester County Peekskill Sanitary Sewer District. As part of this application, the county Somers Sewer District 1 will be expanded to the entirety of the project property. A sanitary sewer conveyance system extension down Reynolds Drive is proposed to connect to the existing sewer in Hoyt Street. The sanitary sewer system will consist of an onsite gravity sewer collection and conveyance system which will discharge to one of two proposed pump stations. From the pump stations, a sewer forcemain will convey the sewage to the terminal manhole in Reynolds Drive.

2.0 PROJECT DESIGN FLOWS AND ANTICIPATED FLOWS

Design maximum daily wastewater flows for the proposed project are based on the hydraulic loading rates given in the New York State Department of Environmental Conservation (NYSDEC) publication *Design Standards for Intermediate Sized Wastewater Treatment Works – 2014* (Dec 14). The following table calculates the hydraulic loading rates, and the design flow rates (gallons per day or gpd) for the proposed project.

Table 1: Project Design Maximum Daily Flow Rate

	Proposed Use	Hydraulic Loading Rate	Design Maximum Daily Domestic Flow (gpd)
Residential Townhomes	58 – Three Bedroom	330 gpd/dwelling	19,140
	23 – Two Bedroom	220 gpd/dwelling	5,060
Town Community Center	450 Visitors	4 gpd/visitor	1,800
Total			**26,000**

For preliminary purposes, an estimate of 1,800 gpd was calculated for the proposed community center to be dedicated to the Town of Somers. The design flow was calculated based on an assumed maximum number of visitors on a peak day. It is anticipated that the peak use for the proposed community center will be during the weekend with the use of the sports arena. The maximum 450 visitors per day assumes six 1-hour events during a single day including 50 kids per practice along with half of the parents using the facilities either during practice or while dropping off/picking up their kids. As the project advances an actual maximum daily flow for the community center will be established based on discussions with the Town on anticipated use.

The anticipated design average daily flows for the project is expected to be significantly less than the design maximum daily design flow. The design maximum daily flows represent conservative flows to ensure that the proposed water works are designed with an ample factor of safety. The anticipated actual flows are based on occupancy rates and measured data for water use. Statistical data (obtained from *Rutgers University, Center for Urban Policy Research*, *Residential Demographic Multipliers*, June 2006) for the average number of occupants in a single-family attached dwelling which are owner-occupied (based on number of bedrooms) was used to calculate the expected number of residents anticipated for the project as shown in the table below. Data from the American Water Works Association (AWWA) Water Conservation Division Subcommittee Report, Water Conservation Measurement Metrics Guidance Report, dated January 2010 shows that the average in home water use is 69.3 gpd per person. This number is reduced to 43.5 gpd per person when water saving fixtures are used, which is the case for this project.

Table 2: Design Average Daily Flow

Proposed Use	Occupancy Rate	Total Anticipated Residents	Water Use Per Resident (gpd)	Water Use (gpd)
Town Community Center	-	-	-	1,800
58 –Three Bedroom Townhomes	3.08 people/unit	179	43.5	7,787
23 – Two Bedroom Townhomes	2.16 people/unit	50	43.5	2,175
Total Anticipated Water Use (gpd)				**11,762**

As demonstrated above, through the use of water saving fixtures as required by current building code, a design maximum flow of 26,000 gpd is proposed for the project, while the actual anticipated flows are 11,762 gpd.

Although the anticipated average daily flow for the project is lower than the design maximum daily flows, the design maximum daily flows are used for the design of the system. This provides an additional factor of safety in the proposed design.

The peak hourly flow for the domestic and park is calculated using a peaking factor that is based on the population of the subject project. *Recommended Standards for Wastewater Facilities - 2014* was used to determine a peaking factor of four.

Peak Hourly Flow

26,000 gpd ÷ (24 hr/day) ÷ (60 min/hr) = 18.0 gallons per minute (gpm)

Peak Hourly Flow **=** 18.0 gpm x 4 = **72.0 gpm**

3.0 PROPOSED CONNECTION TO SOMERS SEWER DISTRICT #1 AND THE WESTCHESTER COUNTY PEEKSKILL SANITARY SEWER DISTRICT

Existing 6 inch and 8-inch ductile iron pipe (DIP) forcemains run along US Route 6. These sewer forcemains originate in The Preserves development and run along US Route 6 ultimately discharging into a manhole located at the intersection of Hill and Lee Boulevards in the Town of Yorktown. Sewage then flows by gravity into the Peekskill Wastewater Treatment Plant. The sewer forcemains north of the project site are owned by the Town of Somers and are part of Somers Sewer District #1. Since the sewage from Somers Sewage District #1 discharges to the Peekskill Wastewater Treatment Plant, Somers Sewer District #1 is also part of the Westchester County Peekskill Sanitary Sewer District. The Trailside Estates at Somers Project is proposing to connect to the conveyance system constructed as part of the Somers Realty Planned Hamlet which ultimately discharges to the existing 6 inch and 8-inch diameter forcemains.

The Peekskill Wastewater Treatment Plant (WWTP) is approved for a monthly average flow of 10 mgd (million gallons per day). Based on review of the discharge monitoring reports from the United States Environmental Protection Agency (EPA), the Peekskill WWTP has averaged between 5.15 to 8.11 mgd over the past 24 months. The proposed project would create an additional 0.03 mgd. Therefore, there is sufficient capacity in the Peekskill WWTP to accommodate the proposed project.

The project proposes to connect to the existing gravity sewer main along Clayton Boulevard which discharges to the Somers Realty Corp. sewer pump station at the intersection of US Route 6 and Clayton Boulevard. Based on initial discussions with the Town of Somers, the Somers Realty pump station is currently operating below the maximum design flow of the system. Based on an initial analysis of the Somers Realty pump station there is enough remaining available capacity for the subject project while still being below the original design parameters. Therefore, since the flow from the pump station plus the peak flow from the subject project is less than the original design parameters for the sewer pump station, the additional flow does not propose to have an impact on the system downstream of the Somers Realty pump station. Refer to Section 6.0 for our analysis of the Somers Realty Pump Station.

4.0 PROPOSED COLLECTION SYSTEM COMPONENTS

A gravity sewage collection and conveyance system consisting of 8-inch diameter PVC SDR 35 sewer mains and precast concrete manholes will be installed onsite. The sewage collection and conveyance system will flow by gravity to one of two onsite pump stations. Two duplex pump stations are proposed to be installed and will connect to the approved terminal sewer manhole and gravity sewer system along Reynolds Drive. A backup generator will be provided for each pump station to power the pumps in the event of power failure. The proposed sewer collection and conveyance system will consist of both onsite improvements and offsite improvements along Reynolds Drive, Columbus Street and Hoyt Street. The onsite and offsite improvements are proposed to consist of the following:

A. Offsite Improvements:
    a. Proposed Sewer Manholes: 9 Total
    b. Proposed 8" Diameter Sewer Main: 1,210 length feet
    c. Proposed Sewer Forcemain: 340 length feet
B. Onsite Improvements:
    a. Proposed Sewer Manholes: 28 Total
    b. Proposed 8" Diameter Sewer Main: 5,640 length feet
    c. Proposed Sewer Forcemain: 2,660 length feet
    d. Two Sewer Pump Stations and Two Valve Pits

Wastewater flow from each townhome will be conveyed by individual 4" diameter PVC SDR 35 sewer service connection. The service connections will be installed with a minimum slope of ¼" per foot meeting the requirements of DEC 14. Each sewer service connection will connect to an 8" PVC SDR 35 gravity sewer main. The 8" gravity sewer mains will flow the proposed onsite pump stations to be conveyed to the sewer conveyance system along Reynolds Drive which was previously approved and proposed to be constructed as part of this project. As part of the proposed connection the Somers Realty Planned Hamlet Pump Station will be analyzed to determine if any modifications are necessary.

All PVC SDR 35 pipe will contain rubber push on gaskets at pipe connections. Sewer manholes will be installed at all bends for access and maintenance. All sewer manholes will have exterior asphalt coating and contain water tight connections at all pipe connections. Cleanouts will be provided on each sewer service connection just outside of the townhomes. All sewer mains will be pressure tested, and all manholes vacuum tested in accordance with the *Recommended Standards for Wastewater Treatment Works*.

5.0 PUMP STATION DESIGN

Wastewater flow from each townhome and the proposed community center will be conveyed by gravity to one of two onsite sewer pump stations. Sewer pump station #1 is located at the southern end of the project site. Wastewater from the southern most 60 townhome units are conveyed by gravity to sewer pump station #1. From pump station #1, a sewer forcemain conveys the wastewater across the project site and discharges to an onsite sewer manhole where it is then conveyed by gravity to sewer pump station #2. Sewer pump station #2 is located in the northeast corner of the project site. The wastewater from the remaining 21 townhome units and community center are conveyed by gravity to sewer pump station #2. The sewer forcemain from pump station #2 conveys all of the onsite wastewater to the terminal sewer manhole along Reynolds Drive.

The pump stations will be sized to convey at a minimum the peak hourly flow from the subject project and the community center. The pumps will need to achieve this flow rate while pumping against the static and friction heads in the system. The static head the pumps will need to overcome will be from the liquid level in the pump station wet well and the elevation of the terminal sewer manhole along Reynolds Drive. Duplex grinder pumps are proposed for each pump station. The grinder pumps allows a smaller diameter forcemain, which will help to achieve a minimum velocity of 2.0 ft/s in the proposed forcemains in accordance with DEC 14. A 3-inch diameter forcemain is proposed. Sewer pump station

#1 will be sized to convey the wastewater from 60 townhomes and sewer pump station #2 will be sized to convey the wastewater from sewer pump station #1 plus the wastewater from 21 townhomes and the community center. Generally, the project will have an even distribution of two and three bedroom townhomes throughout the property.

Pump station #1 will be design to accommodate the following:

	Proposed Use	Hydraulic Loading Rate	Design Maximum Daily Domestic Flow
Residential Townhomes	43 – Three Bedroom	330 gpd/dwelling	14,190 gpd
	17 – Two Bedroom	220 gpd/dwelling	3,740 gpd
		Total	**17,930 gpd**

The maximum daily flow rate for the 17,930 gpd reaching pump station #1 is calculated as follows:

17,930 gpd ÷ (24 hr/day) ÷ (60 min/hr) = 13 gallons per minute (gpm)

Recommended Standards for Wastewater Facilities - 2014 was used to determine a peaking factor of four using the peaking factor of four the peak hourly flow is calculated as follows:

Peak Hourly Flow = 13 gpm x 4 = 52 gpm

As detailed in a later section of this report, the pump selected for pump station #1 will provide a flow rate of 63 gpm.

Pump station #2 will be design to accommodate the following:

	Proposed Use	Hydraulic Loading Rate	Design Maximum Daily Domestic Flow
Residential Townhomes	15 – Three Bedroom	330 gpd/dwelling	4,950 gpd
	6 – Two Bedroom	220 gpd/dwelling	1,320 gpd
Town Community Center	450 Visitors	4 gpd/visitor	1,800 gpd
Total			**8,070 gpd**

The maximum daily flow rate for the 8,070 gpd reaching pump station #2 is calculated as follows:

8,070 gpd ÷ (24 hr/day) ÷ (60 min/hr) = 6 gallons per minute (gpm)

Recommended Standards for Wastewater Facilities - 2014 was used to determine a peaking factor of four using the peaking factor of four the peak hourly flow is calculated as follows:

Peak Hourly Flow = 6 gpm x 4 = 24 gpm

The combined peak hourly flow to pump station #2 from the above calculated domestic flow and the calculated pump station #1 flow is as follows:

Combined Peak Hourly Flow for pump station #2 = 24 gpm + 63 gpm = 87 gpm.

As detailed in a later section of this report, the pump selected for pump station #2 will provide a flow rate of 92 gpm.

5.1 Pumps and Pump Controls

Duplex submersible grinder pumps are proposed to convey the sewage flow contributing to each pump station generated from the proposed development. The pumps will be housed in a six-foot diameter wet well. The submersible pumps will be controlled via a liquid level probe in the wet well that will turn the pumps on or off depending on the water level within the wet well. The pump controller will also alternate the lead/lag designation of the pumps. Additionally, a backup float system will be provided to operate the pumps independent of the probe controls in the event of a probe control system failure.

5.2 Pump Design Criteria

Pump station #1 has been designed to meet or exceed the calculated peak hourly flow of 52gpm. Two (2) MP 3102 HT 3 phase 2 poles 60hz 263Ø151mm grinder pumps are proposed which will be capable of providing a flow rate of 63 gpm.

Pump station #2 has been designed to meet or exceed the calculated peak hourly flow of 80gpm. Two (2) MP 3102 LT 3 phase 2 poles 60hz 216Ø122mm grinder pumps are proposed which will be capable of providing a flow rate of 92 gpm.

As discussed above, the pump design is based on the average design flow reaching the pump station and a peaking factor of 4.0. The static head and losses associated with bends, entrance and exit losses and valves to calculate a total dynamic head (TDH) at the peak flow using a Hazen-Williams “C “value of 120. The specific flows and TDHs for the pump station are discussed below.

Based upon an average daily flow rate of 26,000 gallons per day (gpd) and a peaking factor of 4.0, a peak design sewage inflow rate of 72 gallons per minute (gpm) was calculated for the entire project. Separate peak design sewage inflow rates have been calculated for each pump station based on the number of townhomes conveyed to each station.

Pump station #1 has an average daily flow rate of 17,930 gallons per day (gpd), a peaking factor of 4.0, and a peak design sewage inflow rate of 52 gpm. As noted on the attached pump curve the selected pumps for pump station #1 can pump 63gpm with 113’ of total dynamic head which is greater than the minimum required calculated peak hourly flow rate of 52 gpm. The calculations and pump curve can be found in Appendix A.

Pump station #2 has a combined peak hourly flow rate of 87 gpm as calculated above. As noted on the attached pump curve the selected pumps for pump station #2 can pump 92 gpm with 50’ of total dynamic head which is greater than the minimum required calculated peak hourly flow rate of 87 gpm. The calculations and pump curve can be found in Appendix A.

5.3 Pump Controls

A submersible level control system is proposed for each of the pump stations. This system is composed of a submersible level transducer to control and monitor the operation of the duplex pump station and provide lead-lag automatic alternation, high and low level alarms (Visual and Audible).

Both submersible grinder pumps within each pump station will shut off at the “both pumps off“ set point. When the level in the wet well rises to the second set point, “lead pump on”, a signal will be sent to the control panel to turn the lead pump on. The “lead pump on” set point will be 1 foot above the “both pumps off” set point. The lead pump shall operate until the liquid level reaches both pumps off level (pump(s) shut off). If the liquid level in the wet well continues to rise to the “lag pump on” set point, 6 inches above the “lead pump on” set point, the control panel will, in addition to the lead pump, turn on the lag pump. The further rise of the liquid level within the wet well 6 inches to “High Level Alarm” set point will result in an alarm condition being transmitted to operating personnel via an auto-dialer to the sewer system operator.

In the event that the primary control system fails to operate the pumps, and the wet well level rises above the high-level alarm set point, a back-up float pump control system will override the primary pump controller and take over control of the pumps. Upon the liquid level reaching 6 inches above the "high level alarm", the back-up float will turn on both the lead and lag (after 45 second delay for lag) pumps. Upon the liquid level reaching 6 inches below the low alarm," a backup float will simultaneously turn both pumps off. The station will continue to operate in this mode until the alarm condition is corrected, and the primary pump control system has been placed back into operation.

5.4 Wet Well

Pump Station #1:

The average daily flow rate for flows reaching the pump station is 13 gpm. The pump station wet well has been designed based on the average daily flow reaching the pump station. The pump dose volume for each pump station is set to provide less than 30-minute detention time, at the average daily flow as recommended by *Recommended Standards for Wastewater Facilities*. The maximum pump dose volume is determined by multiplying the average daily flow by 30 minutes and is calculated as follows:

Maximum Volume: 13 gpm x 30 min = 390 gallons

The pump station is designed with a 1.0-foot difference between the lead pump on and pumps off. For a 6-foot diameter wet well, this equates to a volume of 211 gallons. The maximum detention time at average daily flow for full build out is then:

211 gallons/13 gpm = 16 minutes

The minimum pump cycle will be when the inflow to the pump station is half of the pumping rate. As noted above, a single pump will operate at 58 gpm. At the point where inflow is equal to half of the pumping rate (58 gpm/2 = 29 gpm) the net out flow (pump rate minus inflow rate) will equal the inflow. As this is the case the wet well fill time will equal the pump out time.

As noted above, the lead pump on to pumps off of 1.0-foot for the 6-foot diameter wet well is proposed. This equates to a 211-gallon volume.

The pump cycle time for the 211-gallon dose is then:

Fill Time = 211 gal ÷ 29 gpm = 7.3 minutes

Pump Run Time = 211 gal ÷ 29 gpm = 7.3 minutes

The minimum pump cycle is calculated to be 14.6 minutes equating to an average of 4.1 total starts per hour or an average of 2.1 starts per pump per hour.

The 6-foot diameter and 10.9- foot tall wet well structure has a total volume of approximately 2,300 gallons.

Guiderails for the lifting and lowering of the proposed submersible grinder pumps will be provided. A portable hoist socket has been provided at the top of the wet well. This socket will be compatible with a portable hoist currently used by the Somers Sewer Department in order to lift and lower the submersible pumps.

Pump Station #2:

The average daily flow rate for flows reaching the pump station is 19 gpm. The pump station wet well has been designed based on the average daily flow reaching the pump station. The pump

dose volume for each pump station is set to provide less than 30-minute detention time, at the average daily flow as recommended by *Recommended Standards for Wastewater Facilities*. The maximum pump dose volume is determined by multiplying the average daily flow by 30 minutes and is calculated as follows:

Maximum Volume: 19 gpm x 30 min = 570 gallons

The pump station is designed with a 1.0-foot difference between the lead pump on and pumps off. For a 6-foot diameter wet well, this equates to a volume of 211 gallons. The maximum detention time at average daily flow for full build out is then:

211 gallons/19 gpm = 11 minutes

The minimum pump cycle will be when the inflow to the pump station is half of the pumping rate. As noted above, a single pump will operate at 92 gpm. At the point where inflow is equal to half of the pumping rate (92 gpm/2 = 46 gpm) the net out flow (pump rate minus inflow rate) will equal the inflow. As this is the case the wet well fill time will equal the pump out time.

As noted above, the lead pump on to pumps off of 1.0-foot for the 6-foot diameter wet well is proposed. This equates to a 211-gallon volume.

The pump cycle time for the 211-gallon dose is then:

Fill Time = 211 gal ÷ 46 gpm = 4.6 minutes

Pump Run Time = 211 gal ÷ 46 gpm = 4.6 minutes

The minimum pump cycle is calculated to be 9.2 minutes equating to an average of 6.5 total starts per hour or an average of 3.3 starts per pump per hour.

The 6-foot diameter and 13.4- foot tall wet well structure has a total volume of approximately 2,800 gallons.

Guiderails for the lifting and lowering of the proposed submersible grinder pumps will be provided. A portable hoist socket has been provided at the top of the wet well. This socket will be compatible with a portable hoist currently used by the Somers Sewer Department in order to lift and lower the submersible pumps.

5.5 Valve Pit

A precast concrete valve pit will be provided for the pump station to house gate valves, check valves, plug valves and a bypass piping system. The valve pit will also house discharge pressure gauges on the forcemain. The valve pit will be provided with a floor drain to the wet well for removal of accumulated water. A gate valve will be provided on the drain line.

5.6 Check Valves

Check valves will be provided on both pump discharge headers. The proposed check valves will be swing type with a weight and lever. The check valves will have a pressure rating of 150 psi.

5.7 Control Panel

The controls for the pump station will be post mounted inside the pump station fence. Controls will include power panels, a transfer switch for auxiliary power, pump control panel, and an autodialer. The controls will be house in a weather proof NEMA enclosure. Access to the pump pit area will be provided via a 10-foot wide gate.

5.8 Auto-dialer and Alarm Communication

In order to transmit pump station alarm conditions, an autodialer with telephone will be provided. Alarm conditions will include pump station “Wet Well High Level” alarm, “Wet Well Low Level” alarm, “Power Failure” alarm and “Pump Failure” alarm. The auto-dialer will be capable of transmitting the four alarms separately. The power and pump failure systems will also have contacts connected to the autodialer. The autodialer shall call a designated representative of the owner and Adam Smith at the Town of Somers Sewer Department. Dial out numbers will be coordinated at startup.

5.9 Forcemains

The proposed sewer forcemains will be used to convey raw sewage from the sewer pump station #1 to SMH 4 and from sewer pump station #2 to the terminal sewer manhole along Reynolds Drive. Each pump station will have a 3” diameter PVC SDR 21 forcemain. The PVC SDR 21 will have bell and spigot joints and factory installed gaskets. The fittings and elbows will be glued SCH 80 fittings. Any horizontal or vertical bends will be provided with concrete thrust blocks. The forcemain shall be provided with 3'-6" minimum cover.

5.10 Emergency Backup Power

The controls, autodialer and telephone modem will be connected to an uninterrupted power supply (UPS) to maintain control and communications while the backup generator starts.

A natural gas generator will supply backup power. The generator will be able to run both the lead and lag pump, controls and communications. An automatic transfer switch will provide automatic startup of the backup generator and automatic transfer between primary and backup power as required.

6.0 EVALUATION OF SOMERS REALTY PUMP STATION

6.1 Current Flows

The Somers Realty Pump Station (SRPS) currently receives wastewater discharges from The Preserves, Somers Commons, Somers Realty and Crossroads at Baldwin Place. Per the Engineering Report for Somers Realty Planed Hamlet Subdivision (SR Design Report) prepared by Keane Coppelman Gregory Engineers P.C. revised September 10, 2013, and the subsequent Wastewater Engineering Report for Crossroads at Baldwin Place prepared by Insite Engineering, Surveying & Landscape Architecture dated November 18, 2016 the design flows for the SRPS are as follows:

- Peak hourly flow of 616 gpm
- Short Duration Potential Pumped Peak Flow of 821 gpm

The Short Duration Potential Pumped Peak Flow (pumped peak flow) was based on simultaneous pumping of The Preserves & Crossroads at Baldwin Place and gravity flow from Somers Common, Somers Realty Planned Hamlet, 250 Mahopac Avenue, 51 US Route 6, 55 US Route 6, & 63 US Route 6.

6.2 Current Capacity of Somers Realty Pump Station

The SRPS is a triplex pump station designed for simultaneous operation of two pumps. As per the SR Design Report, the capacities of the pump station are as follows:

- 640 gpm with 1 pump operating
- 950 gpm with 2 pumps operating

Therefore, the overall capacity is 950 gpm, and the design excess capacity is:

950 gpm – 821 gpm = 129 gpm.

6.3 Evaluation of New Connections

As calculated above, the additional peak flow to the SRPS from the Trailside Estates project is 92 gpm.

The new connection will use 92 gpm of the design excess capacity in the SRPS, leaving an excess capacity of:

129 gpm – 92 gpm = 37 gpm.

Therefore, the SRPS has adequate capacity for the new connections without any modifications.

The Trailside Estates project will be connecting to an existing 8” diameter gravity sewer line which runs along Clayton Boulevard and ultimately connects to the Somers Realty Pump Station. As noted in appendix B, the minimum slope of the existing 8” diameter sewer line is 0.8% which results in a total pipe capacity of 1.2 cfs. Based on the existing calculated peak flows from the Somers Realty Planned Hamlet and the peak flow from the Trailside Estates project, the calculated combined peak flow for the 8” diameter sewer pipe is 0.8 cfs. As the combined peak flow of 0.8 cfs is less than the capacity of the 8” diameter pipe of 1.2 cfs, the existing sewer pipe has enough capacity to convey the increased flow from the proposed connection.

APPENDIX A

Sewer Pump Curve and Sizing Calculations

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OWTS for Trailside Pump Station #1
Pump Design Calculations

Design Flow	17,930	gal/day	(110 gpd/bedroom)
Peak Flow	52.0	gpm	Peak Flow = $\frac{\text{(Design Flow)(4)}}{\text{(24hr/day)(60min/hr)}}$ Use 4x Daily Flow for Peak Flow
Static Head	80	ft	Vertical distance from bottom of pump pit to invert of SMH
C	120		Roughness coefficient for smooth plastic pipe
d	3	in	Diameter of force main
L	2125	ft	Length of force main
Q	63	gpm	Flow Rate
V	2.9	ft/s	Velocity
L_e	50	ft	Equivalent length to account for losses in valves and bends
L_t	2175	ft	Total Length = $L + L_e$
HL	33	ft	$HL = \frac{10.44(L_t)(Q^{1.85})}{(C^{1.85})(d^{4.87})}$
Total Dynamic Head	113	ft	TDH = HI + Static Head

Use Flygt MP 3102 HT 3 phase 2 poles 60hz 263Ø151mm grinder pump (or approved equal).

These pumps will pump 63 gpm with a Total Dynamic Head of 113 feet.

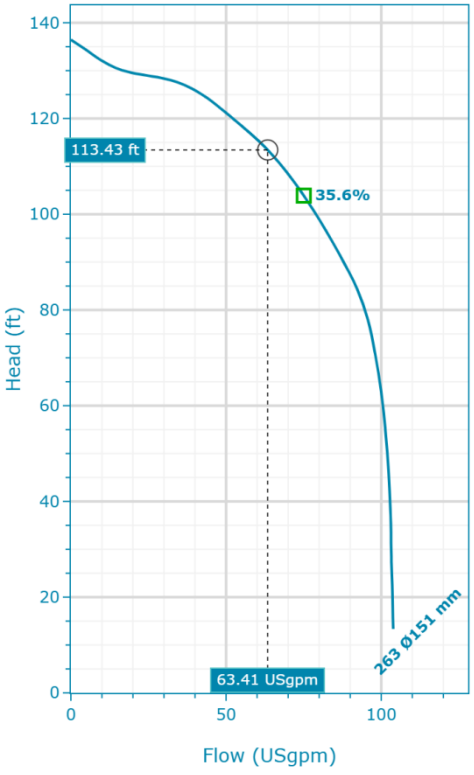
xylem
Let's Solve Water

MP 3102 HT 3~ 263

Created On: 9/22/25

MP 3102 HT 3~ 263 | Configuration Summary

The Flygt M 3000 grinder pumps are high-performing submersible, centrifugal pumps with axial cutters. Excellent for pumping wastewater in residential, commercial and agricultural applications. These grinder pumps reduce waste content to fine slurry, pumped through small-diameter pipes.



Curve: ISO 9906

Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

GENERAL

Explosion Proof
No

Impeller Diameter
151 mm

Max. Pumped Media Temp.
104 °F

MATERIAL AND COATING

Impeller Material
Grey Cast Iron

Stator Cover Material
Grey Cast Iron

Volute Material
Grey Cast Iron

MOTOR

Rated Voltage
460 V

Motor Efficiency Class
Standard

Coupling
Y

Rated Power
6 Hp

INSTALLATION

Installation Type
P - Semi-Permanent, Wet

MP 3102 HT 3~ 263 | Product Details

Description

M 3102

Hard Working, Heavy-Duty Grinder Pump

The Flygt M 3102 grinder is a high-performing submersible centrifugal pump, excellent for pumping wastewater in residential, commercial and agricultural applications. The grinder pump reduces waste content to fine slurry, pumped through small-diameter pipes. The main application for Flygt M 3102 is pressurized sewage systems that are generally used when flat land, uphill topography, surface rock and high water tables pose tough challenges for conventional gravity systems.
Whether you need a single grinder pump, a complete pump station or an entire wastewater system, Xylem offers a smart and economical delivery of wastewater to the nearest pump station or sewer main.

Reliable Operation

The M 3102 is engineered to meet the challenges of wastewater systems. It comes equipped with a unique impeller for optimum hydraulic efficiency and a heavy-duty cutting device, which grinds solids into small particles for easy transport through small-diameter pipes. This eliminates the risk of clogging.
All components are specially designed and manufactured to optimize operation and prolong pump service life.

- Double mechanical seal system. Two sets of mechanical shaft seals work independently to provide double security. They are available in Tungsten carbide (WCCR) or Silicone carbide (SiC) depending on pumped media.
- Made of robust and durable cast iron
- Spin-out outer seal protection design that protect seals from abrasive particles
- Motor cable SUBCAB® specially developed for submersible use

Product Features

- Use for heavy-duty shredding applications
- Non-clogging design
- Reliable operation
- Heavy-duty cutting device

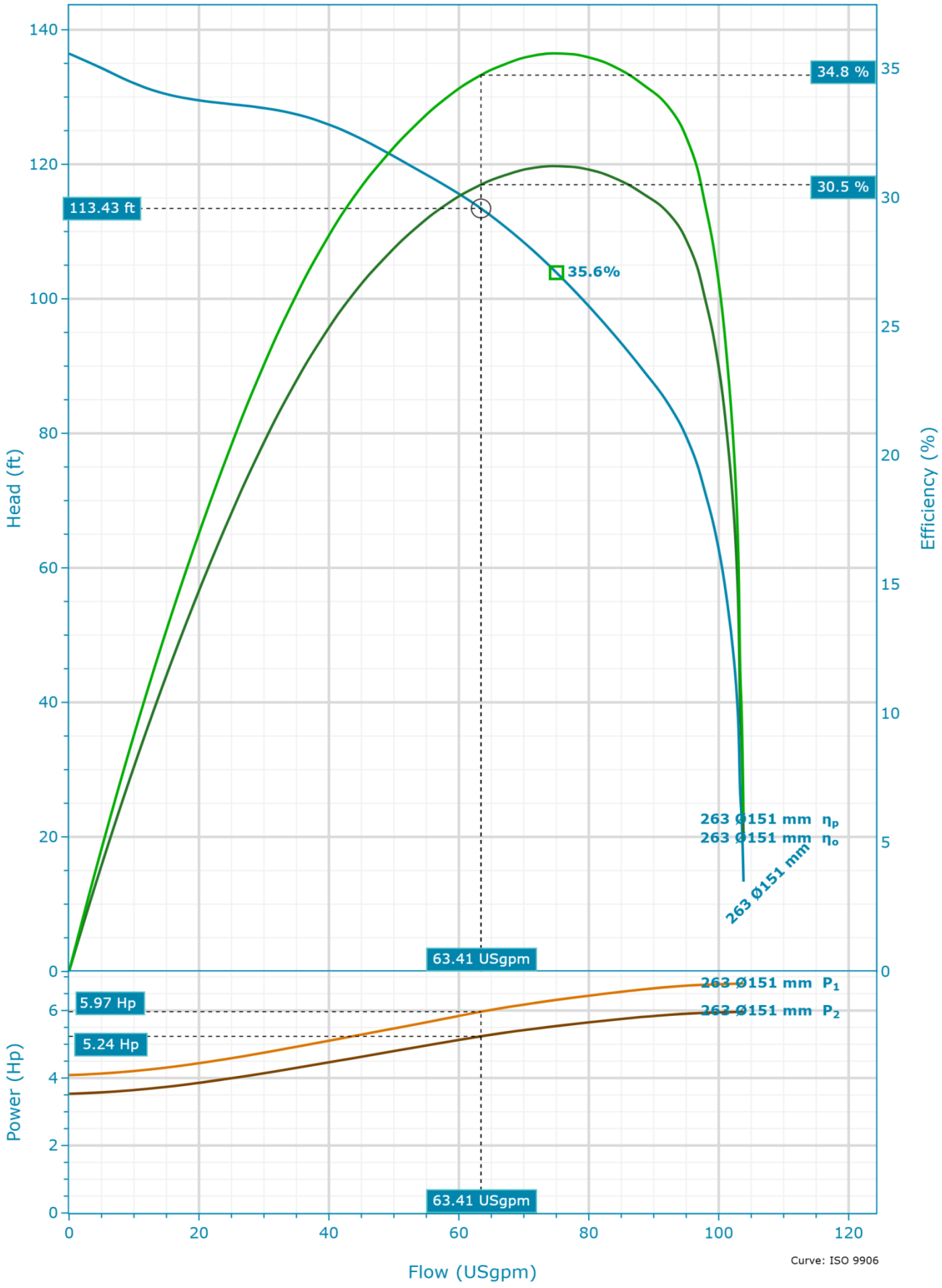
Construction Materials

Impeller Material	Volute Material	Stator Cover Material
Grey Cast Iron	Grey Cast Iron	Grey Cast Iron

Motor

Rated Power 6 Hp	Number Of Phases 3	Start Current Ratio 10.17	Motor Issue 18
Motor Denomination 18-10-2AL	Rated Motor Speed 3,520 RPM	Insulation Class H	Locked Rotor Code L
Motor Efficiency Class Standard	Rated Voltage 460 V	Approval Standard	Max starts per hour 30
Version Code 170	Rated Current 7 A	Total moment of inertia 0.3323 ft²lbf	Power Factor 100% 0.91
Frequency 60 Hz	Start Current 72 A	Type of duty S1	Power Factor 75% 0.87
Max P2 (1x) 5.96 Hp	Starting Current, Direct Starting 72 A	Stator Variant 62	Power Factor 50% 0.8
Number Of Poles 2	Starting Current, Star Delta 24 A	Motor Module 150	Efficiency 100% 87.1 %
			Efficiency 75% 87.3 %
			Efficiency 50% 85.6 %

MP 3102 HT 3~ 263 | Hydraulic Data & Performance Curve



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Selection

Series	Curve Code
M 3000	263
Name	Impeller Diameter

Fluid and Operating Conditions

Fluid Type	Density
Water	62.428 lb/ft³
Fluid Temperature	Dynamic Viscosity

MP 3102 HT 3~ 263

Frequency
60 Hz

Total Flow
63.00 USgpm

Total Head
113.00 ft

Pump Flow
63.00 USgpm

Pump Head
113.00 ft

System Type
Single Pump

Operating Pumps
1

Standby Pumps
No Standby Pump

151 mm

Inlet Diameter
40 mm

Outlet Diameter
1.5 in

Number Of Vanes
6

39.2 °F

Specific Gravity
1

1.567212 cP

Fluid Vapor Pressure
0.118 psi

Atmospheric Pressure
14.7 psi

Elevation
0 ft

Ambient Temperature
68 °F

NPSH Available
33.68 ft

Submergence
0 ft

Design Point

Flow
63.41 USgpm

Head
113.43 ft

Overall Efficiency (ηo)
30.50 %

Pump Efficiency (ηp)
34.75 %

Input Power (P1)
5.97 Hp

Shaft power (P2)
5.24 Hp

Static Head
80.00 ft

Flow To BEP Ratio
84.5 %

Design Curve

Rated Speed
60 Hz

Max Flow
103.82 USgpm

H@QMin
136.46 ft

H@QMax
13.34 ft

BEP
35.6 %

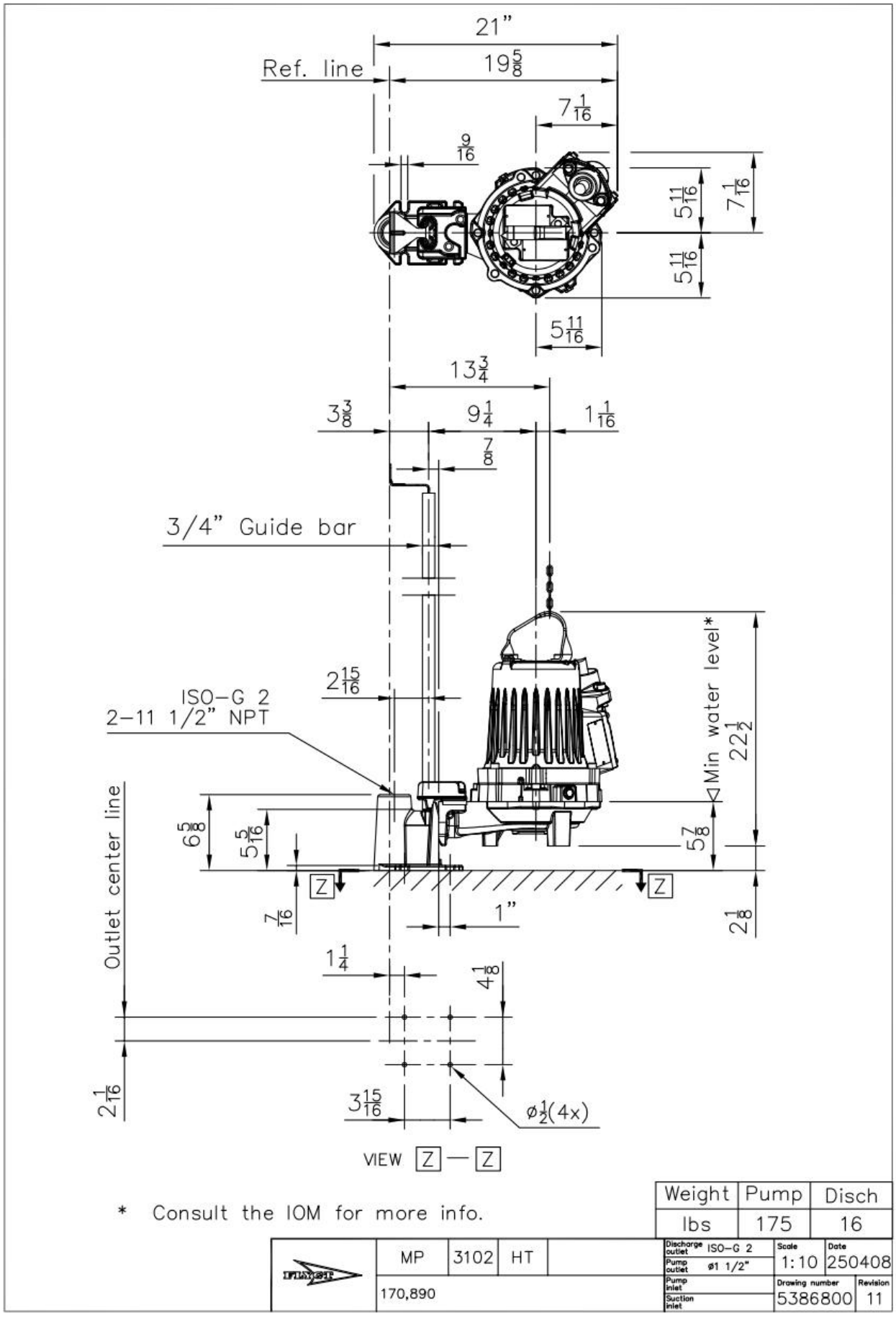
BEP Flow
75.03 USgpm

BEP Head
103.89 ft

Max P2
5.96 Hp

Specific Energy
1,169 kWh/mGal

MP 3102 HT 3~ 263 | Dimensional Data & Drawing



* Consult the IOM for more info.

Weight	Pump	Disch
lbs	175	16

FLYGT	MP	3102	HT	Discharge outlet ISO-G 2 Pump outlet ø1 1/2"	Scale 1:10	Date 250408
	170,890			Pump inlet Suction inlet	Drawing number 5386800	Revision 11

Company

Contact

Phone No.

Email

xylem
Let's Solve Water

APPENDIX B

Existing Sewer Pipe Capacity Calculations

PROJECT: Trailside Estates at Somers
JOB NUMBER: 21241.100
BY: TMB
10/23/2025

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.

Gravity Sewer Peak = 278gpm (Somers Realty Planned Hamlet) + 92 gpm (Trailside Estates)
Gravity Sewer Peak = 370 gpm
Peak flow in cfs= 370 gpm * 1 gallon/7.48 cfs*1 min/60 sec
Peak flow in cfs= 0.8 cfs
As calculated below the 8" gravity sewer main at minimum of 0.8% slope has a capacity of 1.2 cfs exceeding the peak flow of 0.8 cfs

Q (cfs)		PIPE DESIGN			
DESIGN	Capacity	V(ft/s)	n	s (%)	DIA (in)
0.8	1.2	3.6	**0.012**	**0.8**	**8**