STORMWATER PUMP REPORT

for:

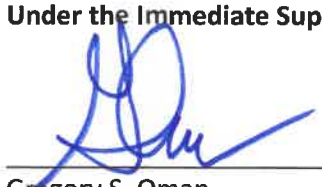
Gulls View Apartments

Block(s): 80
Lot(s): 1.02
Borough of Keyport
Monmouth County, New Jersey

Prepared By:

Menlo Engineering Associates, Inc
261 Cleveland Avenue
Highland Park, New Jersey 08904
T.: 732.846.8585
F.: 732.846.9439

Under the Immediate Supervision of:



Gregory S. Oman
NJ PE # 43441

GSO/hc
MEA # 2017.080.02
Dated: May 28, 2021

menlo engineering associates

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CONTENTS

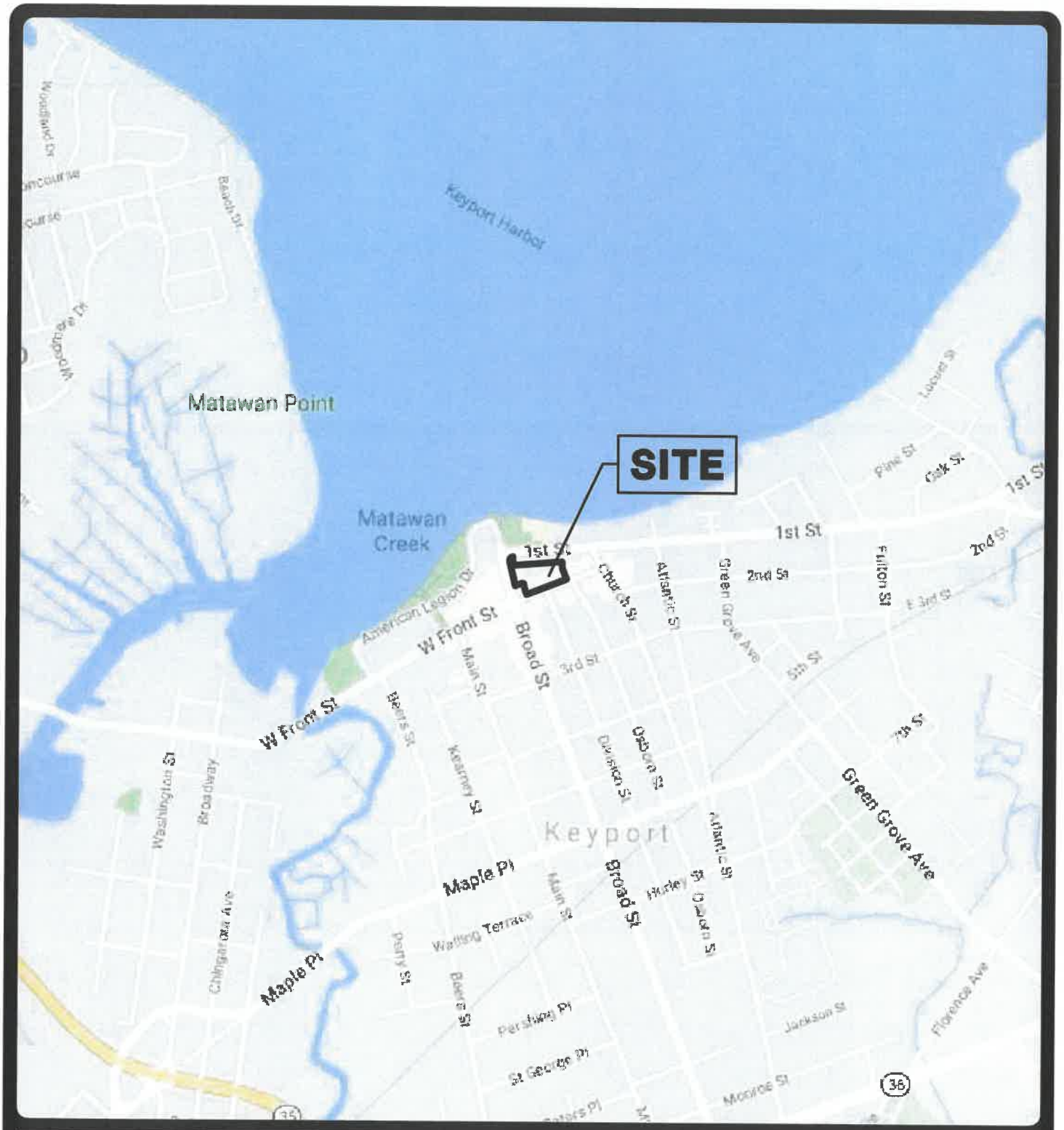
INTRODUCTION

The following Stormwater Pump Design Report details the design elements of the stormwater pump system to be part of the proposed parking addition and the Gull View Apartment within the Borough of Keyport, Monmouth County, New Jersey. This report has been prepared by Menlo Engineering Associates, Inc. and is referenced to plans entitled in part, "Gulls View Apartments".

PROJECT LOCATION & DESCRIPTION

This report examines the stormwater pump configuration associated with development plans for a 1.45-acre tract of land situated in the Borough of Keyport, Monmouth County, New Jersey. The applicant is proposing the replacement of an existing two-story masonry building with a multiunit residential building and its adjacent parking areas.

As exists today a portion of the site drains towards and existing storm sewer pump station that is no longer functional. As part of the application, the existing storm sewer pump station will be replaced with a new storm sewer pump station located adjacent to the proposed apartment building. The new pump station will covey the runoff of half the roof runoff of the proposed apartment building as well as for all the runoff generated by the open space parking lot area. The proposed force main will discharge into the existing 30" RCP storm sewer pipe along Broad street which is part of the existing storm sewer system.



ROAD MAP

Borough of Keyport
Monmouth County

N

BLOCK	LOT
80	1.02

MENLO ENGINEERING ASSOCIATES, INC.
261 CLEVELAND AVENUE
HIGHLAND PARK, NJ 08904
(732) 846-8585

0 250' 600' 750' 1,000'

Scale: 1"=1,000± ft *Job # 2017.080*

STORMWATER PUMP PLAN AND DESIGN

The Stormwater pump station is to be a 6 ft. diameter standar4d fiber glass wet well with two (2) submersible pumps (primary and back up). The pumps are to be NP 3202 MT 3 ~642; 230 volts, 3 phase, 35 hp-1170rpm; 334 mm impeller. The force main will be a 12" diameter PVC SDR21 and is to be installed with a minimum of 4 feet of cover.

The MJK Expert 2100 Level Transmitter, a level transmitter float, was specified for this design. These floats are the mechanism to engage the pump and discharge stormwater. See Appendix B for the MJK Expert 2100 Level Transmitter Data Sheet.

The KwikSwitch, a float connection system, was specified for this design. The floats inside the sump pit will be connected to the KwikSwitch" float connection system. This assembly will be attached directly to the inside wall of the sump pit. See Appendix C for the KwikSwitch Data Sheet.

The PC-3000XC, a controller with remote communication, was specified for this design. The controller is designed to operate up to 3 pumps in pump up or pump down applications. It may be placed either inside the building or outside. See Appendix D for the PC-3000XC Data Sheet.

Pump Design:

The flow used was 3078 GPM and the total dynamic head (TDH) is 29.7 feet.

Total Dynamic Head

Quantity	Item		Equal		Total	K	2800 head loss ft/100	2800 Total	3000 head loss ft/100	3000 Total	3200 head loss ft/100	3200 Total
	Friction Head											
10	12" - DIP	x	1		10							
2	12" - 90deg Elbows	x	30	=	60							
2	12" - Tee (through side out)	x	60	=	120							
2	12" - Gate Valve	x	9	=	18							
2	12" - Check Valve	x	70	=	140							
	(C=140)				348	0.54	2.78	5.22	3.17	5.96	3.59	6.75
262	12" - DIP	x	1	=	262							
	(C=140)				262	0.54	2.78	3.93	3.17	4.48	3.59	5.08
	Elevation Head											
12.80	- High Point											
-5.00	- Pump Elevation											
26.96	- Total Elevation Head							26.96		26.96		26.96
	Total Dynamic Head (feet) =							36.12		37.40		38.79

Area to PS

Subcat Reach Pond Link

Routing Diagram for 2017.080.01-Behar Apt. Storm Pump
Prepared by Menlo Engineering Associates, Inc., Printed 5/27/2021
HydroCAD® 10.10-4a s/n 01129 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Area to PS

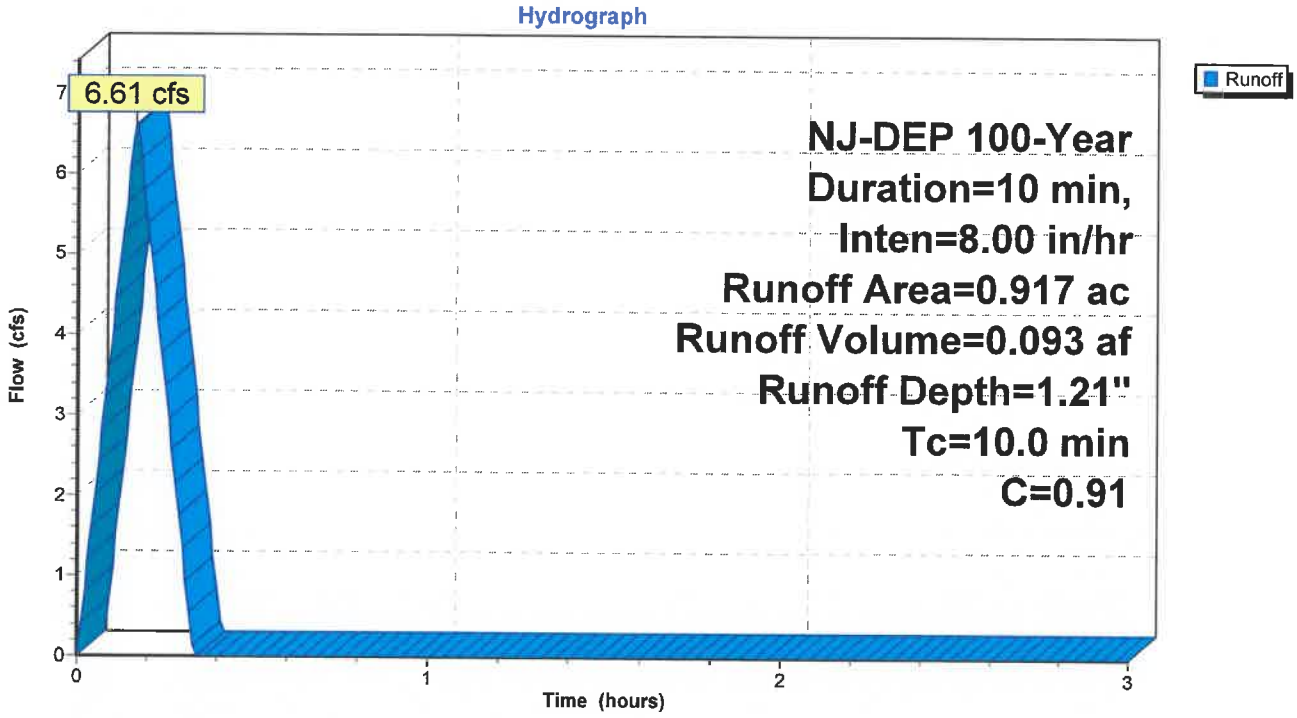
Runoff = 6.61 cfs @ 0.17 hrs, Volume= 0.093 af, Depth= 1.21"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
NJ-DEP 100-Year Duration=10 min, Inten=8.00 in/hr

Area (ac)	C	Description
0.706	0.99	
0.211	0.65	
0.917	0.91	Weighted Average
0.211		23.01% Pervious Area
0.706		76.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Area to PS



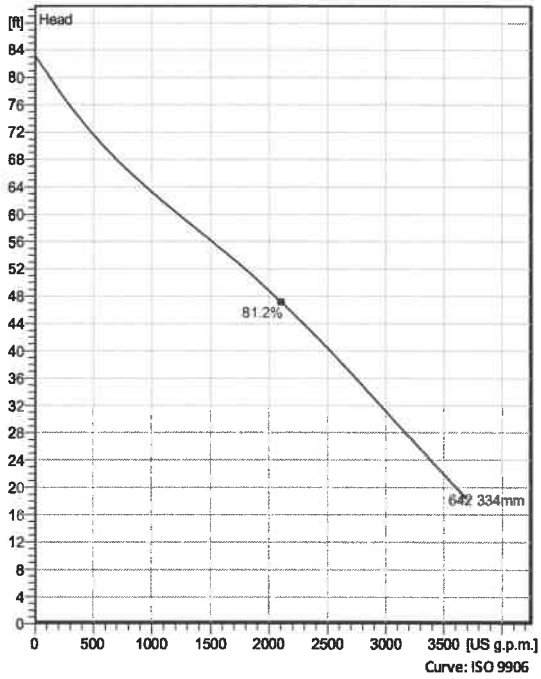
NP 3202 MT 3~ 642

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

FLYGT
a xylem brand

Technical specification

Curves according to: Water, pure ,39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Configuration

Motor number
N3202.660 30-18-6AA-W 35hp

Installation type
P - Semi permanent, Wet

Impeller diameter
334 mm

Discharge diameter
8 inch

Pump information

Impeller diameter
334 mm

Discharge diameter
8 inch

Inlet diameter
250 mm

Maximum operating speed
1170 rpm

Number of blades
2

Max. fluid temperature
40 °C

Materials

Impeller
Stainless steel

Project		**Created by**	H Cruz
Block		**Created on**	5/27/2021 **Last update** 5/27/2021

NP 3202 MT 3~ 642

Technical specification

FLYGT
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Motor - General

Motor number N3202.660 30-18-6AA-W 35hp	**Phases** 3~	**Rated speed** 1170 rpm	**Rated power** 35 hp
ATEX approved No	**Number of poles** 6	**Rated current** 85 A	**Stator variant** 4
Frequency 60 Hz	**Rated voltage** 230 V	**Insulation class** H	**Type of Duty** S1
Version code 660			

Motor - Technical

Power factor - 1/1 Load 0.87	**Motor efficiency - 1/1 Load** 89.1 %	**Total moment of inertia** 9.06 lb ft²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.84	**Motor efficiency - 3/4 Load** 90.0 %	**Starting current, direct starting** 470 A	
Power factor - 1/2 Load 0.77	**Motor efficiency - 1/2 Load** 89.7 %	**Starting current, star-delta** 157 A	

Project
Block

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Created on 5/27/2021 **Last update** 5/27/2021

NP 3202 MT 3~ 642

Performance curve

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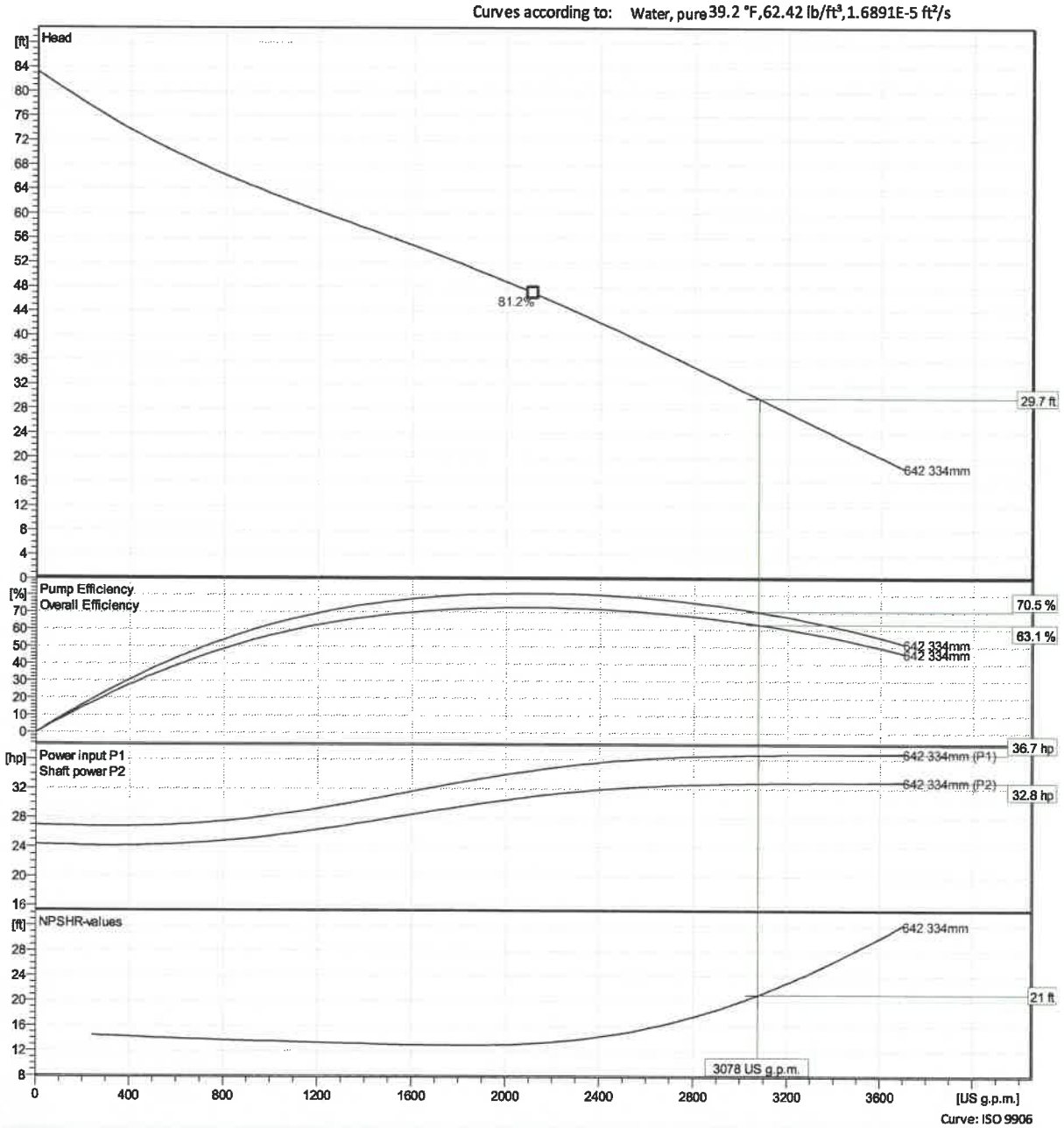
Duty point

Flow	Head
3080 US g.p.m.	29.7 ft



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NP 3202 MT 3~ 642

Duty Analysis

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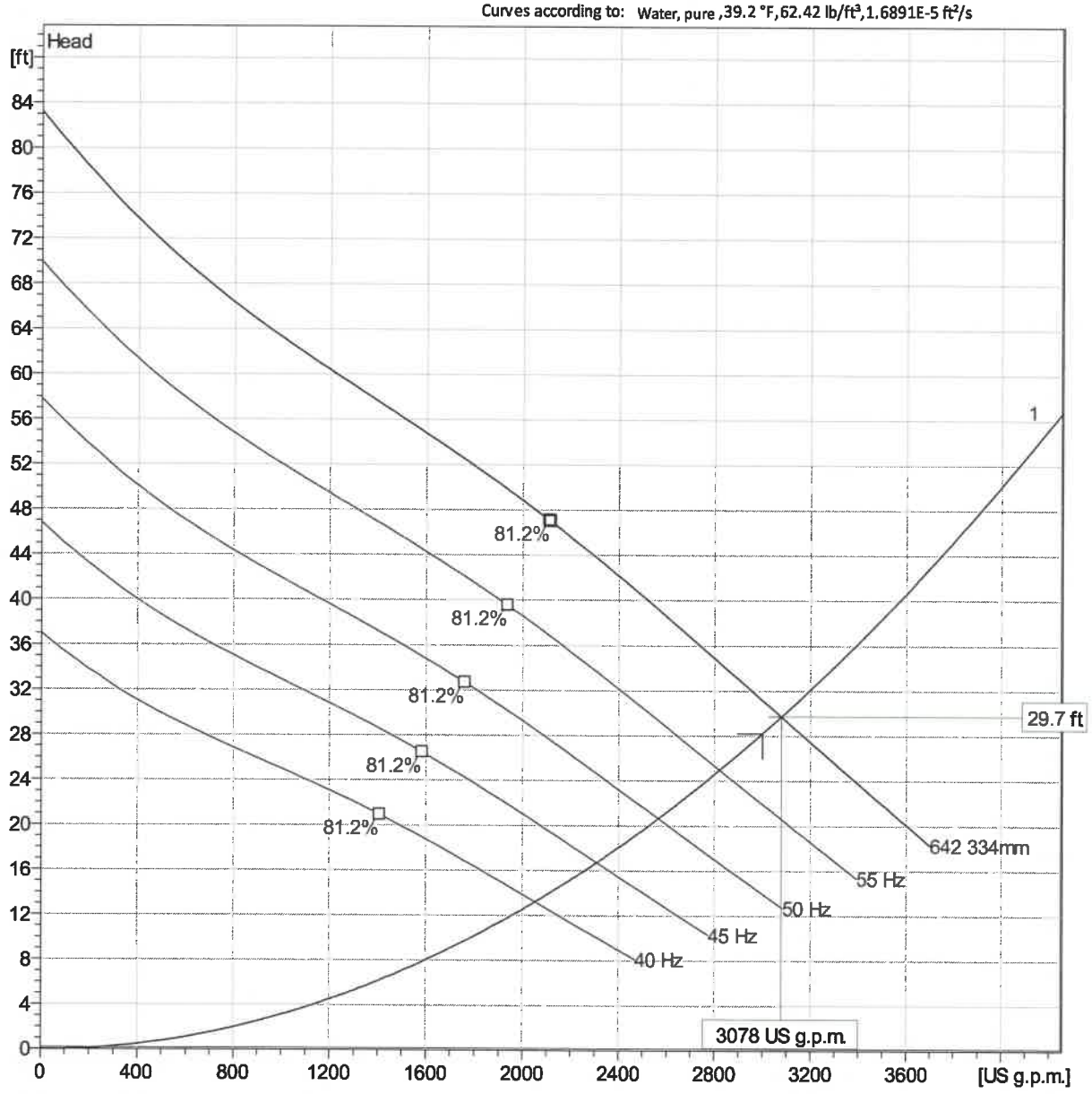
Curves according to: Water, pure ,39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific Energy	NPSHre
1	3080 US g.p.m	29.7 ft	32.8 hp	3080 US g.p.m	29.7 ft	32.8 hp	70.5 %	148 kWh/US M	21 ft

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NP 3202 MT 3~ 642

VFD Curve

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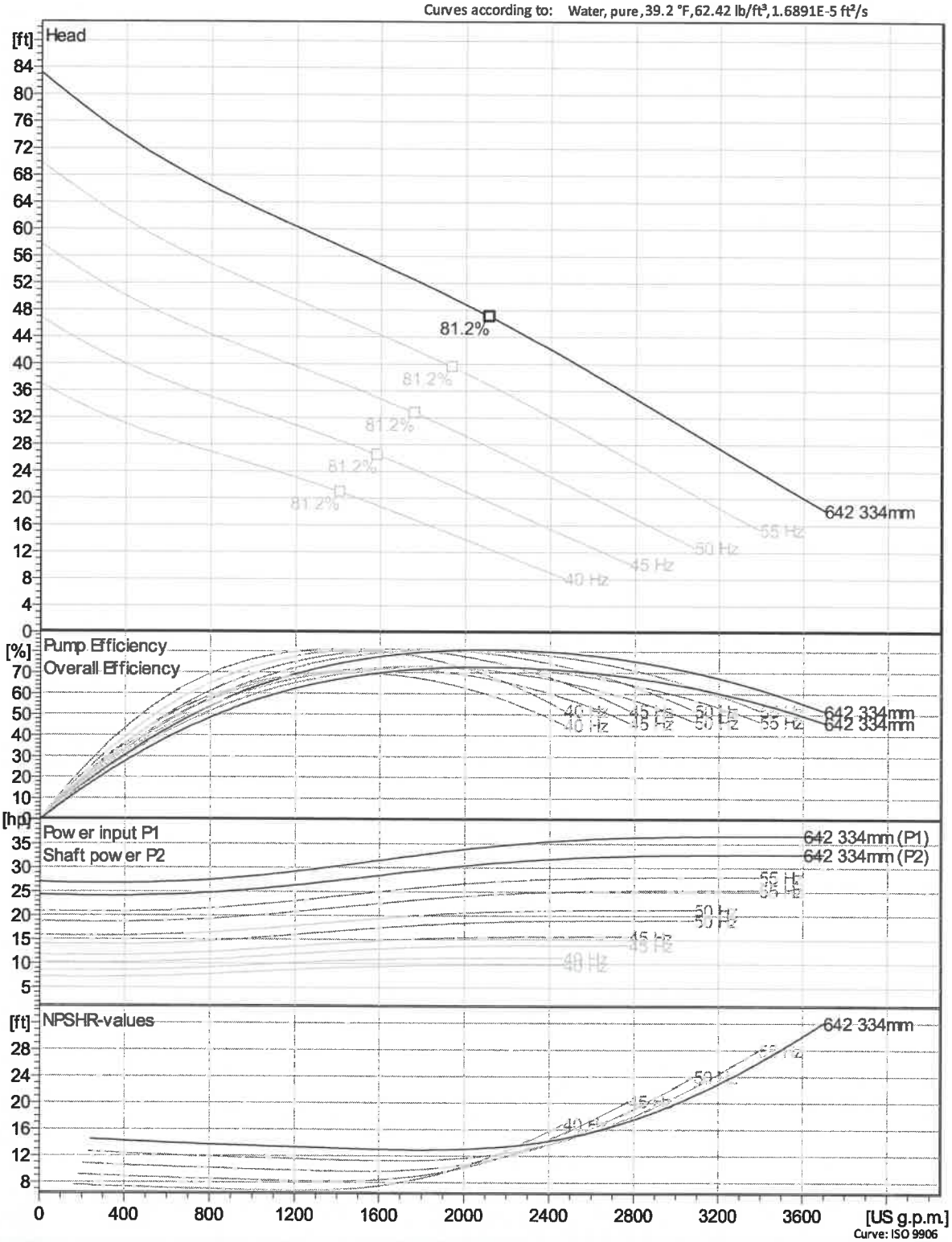
Curves according to: Water, pure, 39.2 °F, 62.42 lb/ft³, 1.6891E-5 ft²/s



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NP 3202 MT 3~ 642

VFD Analysis

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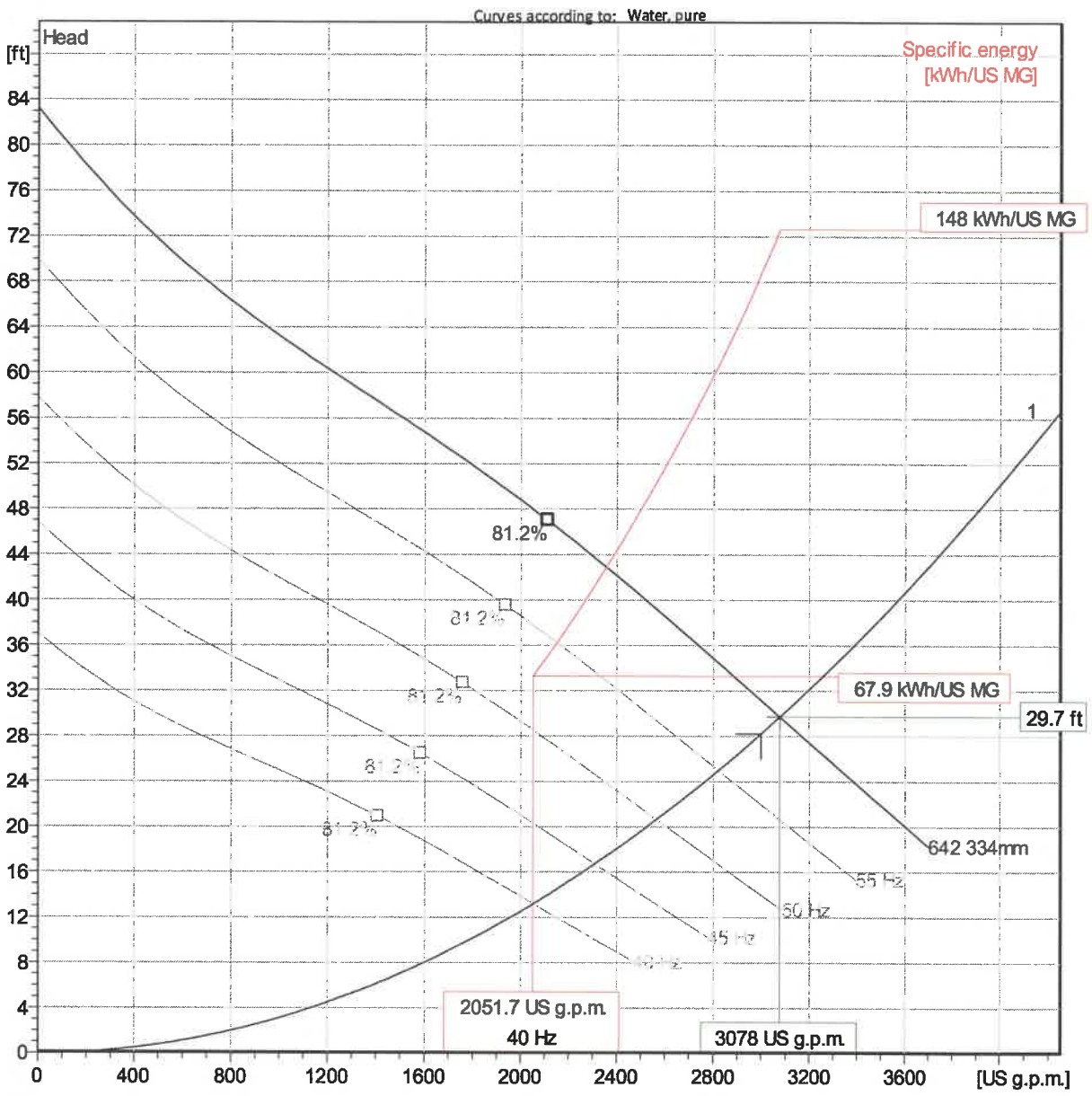

Operating characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific Energy	NPSHre
1	60 Hz	3080 US g.p.m	29.7 ft	32.8 hp	3080 US g.p.m	29.7 ft	32.8 hp	70.5 %	148 kWh/US M	21 ft
1	55 Hz	2820 US g.p.m	25 ft	25.3 hp	2820 US g.p.m	25 ft	25.3 hp	70.5 %	123 kWh/US M	18.3 ft
1	50 Hz	2560 US g.p.m	20.6 ft	19 hp	2560 US g.p.m	20.6 ft	19 hp	70.5 %	102 kWh/US M	15.7 ft
1	45 Hz	2310 US g.p.m	16.7 ft	13.8 hp	2310 US g.p.m	16.7 ft	13.8 hp	70.5 %	83.9 kWh/US M	13.3 ft
1	40 Hz	2050 US g.p.m	13.2 ft	9.72 hp	2050 US g.p.m	13.2 ft	9.72 hp	70.5 %	67.9 kWh/US M	11 ft

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Block		**Created on**	5/27/2021 **Last update** 5/27/2021

NP 3202 MT 3~ 642

Dimensional drawing

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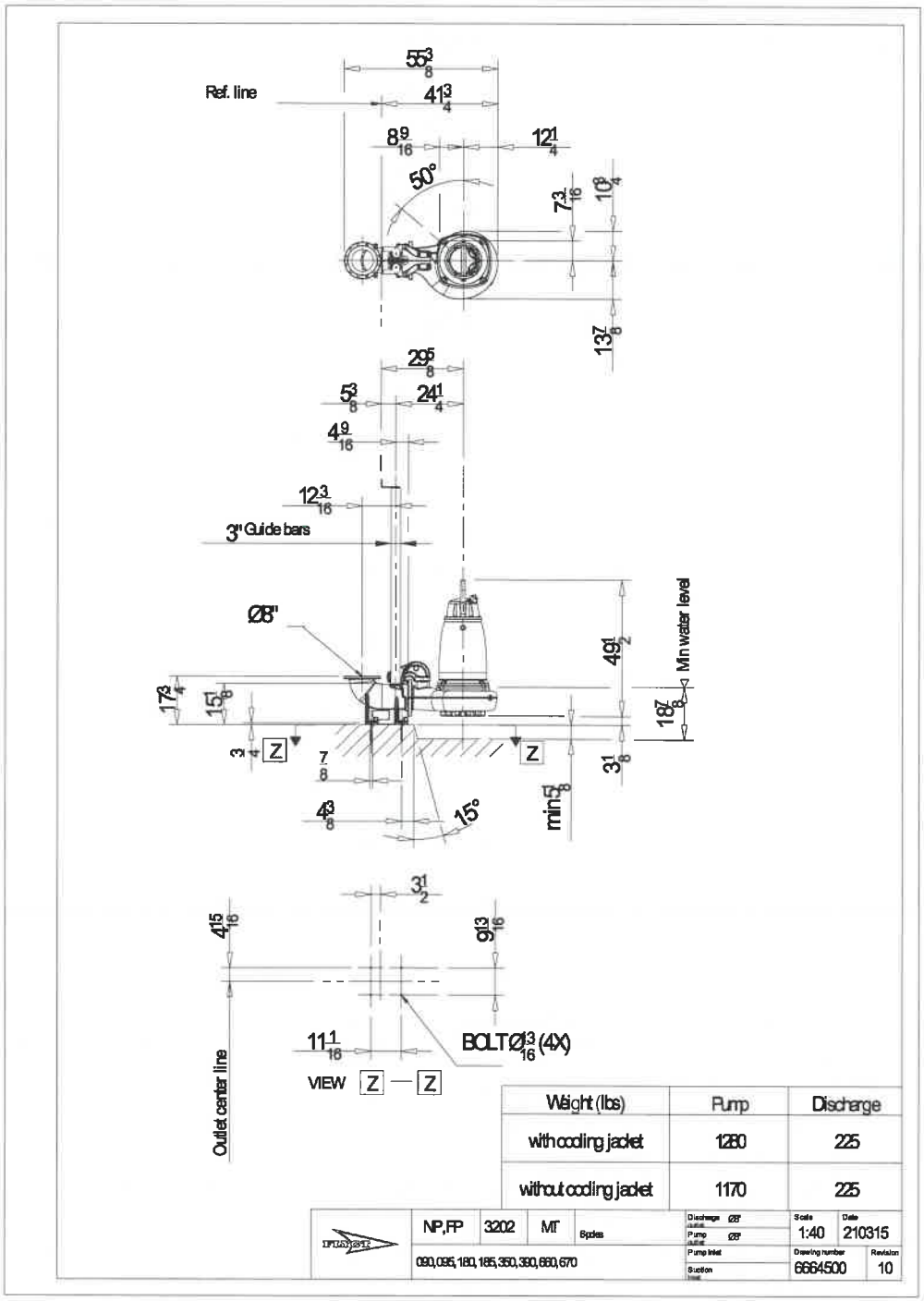


Weight (lbs)	Pump	Discharge
with cooling jacket	1280	225
without cooling jacket	1170	225

FLYGT	NP,FP	3202	MT	Spdes	Discharge Ø8"	Scale 1:40	Date 210315
	090,095,180,185,350,390,660,670				Pump Ø8" / Pump inlet / Suction	Drawing number 6664500	Revision 10

Project
Block

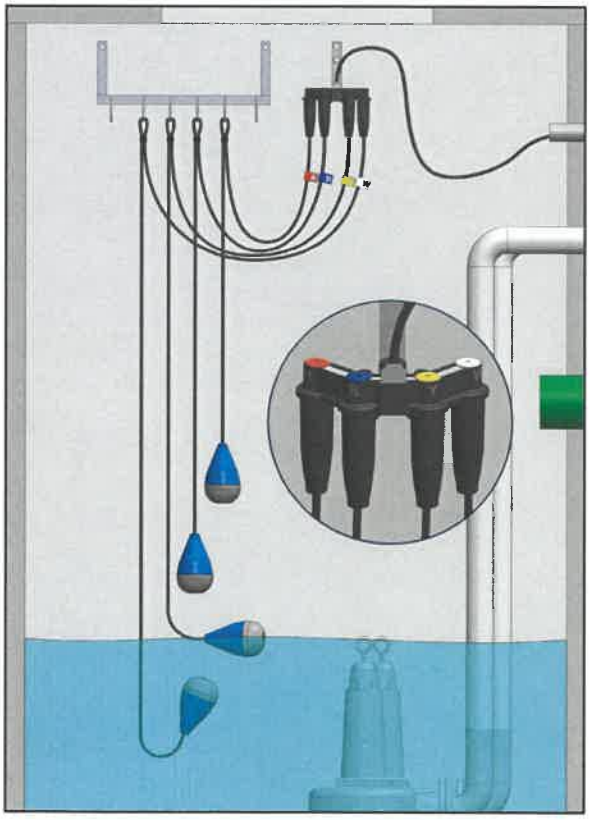
Created by H Cruz
Created on 5/27/2021 **Last update** 5/27/2021

KWIKSWITCH™

REVOLUTIONARY FLOAT CONNECTION SYSTEM

OVERVIEW

The KwikSwitch™ quick release float switch connection system is designed to be installed directly in a wet well. The 4-port manifold easily connects 1-4 KwikSwitch™ float switches for level control applications. The KwikSwitch™ system improves reliability, and significantly reduces installation and float switch replacement time.



APPLICATIONS

- Sewage and effluent lift stations
- Stormwater pump stations
- Low voltage control
- Intrinsically safe applications

FEATURES

- (4) Quick release float switch connections
- Rated for temporary submersion, 6 ft. (1.8m) for 72 hours
- Dual seal design for improved protection against water ingress and corrosive gases typically found in sewage lift stations
- Single manifold multiconductor direct burial rated cable
- Color coded wiring pairs in cable correspond to colored caps on the manifold for easy identification (red-blue-yellow-white)
- Sealing plugs for unused ports
- Manifold provided with stainless steel mounting bracket
- KwikSwitch™ mechanically-activated float switch
- US Pat. 9,559,455 and 9,583,867. Foreign Patents Pending
- CSA Certified
- 2-year limited warranty

PRIMEX®
WATER SYSTEM INTEGRATOR AND CONTROLS PROVIDER

844-4PRIMEX (477-4639)
WWW.PRIMEXCONTROLS.COM

KWIKSWITCH™

REVOLUTIONARY FLOAT CONNECTION SYSTEM

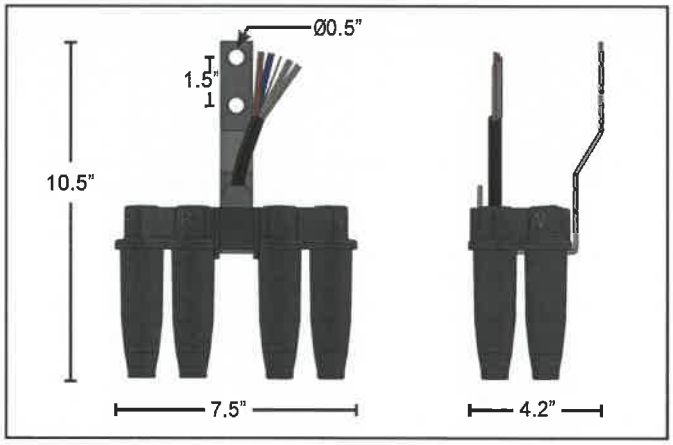
SPECIFICATIONS

Manifold:

- Housing:
  - Material: ABS plastic, black
  - Retaining slot for mounting bracket
  - 1.0" (2.54 cm) diameter caps: red-blue-yellow-white
- Cable:
  - 18 gauge, 8 conductors with ground shield
  - Color coded wiring pairs; red-blue-yellow-white
  - Direct burial PVC TPE TC-ER TFFN (UL) 600V
  - Outside dimension: 0.390" (9.91mm)
- Rating:
  - 1.0 Amp per connection port, 125 VAC
  - Operating temperature: 0°-122°F (-17°-50°C)
  - Storage temperature: -40°-140°F (-40°-60°C)
- Mounting Bracket:
  - Material: 304 stainless steel
  - Flat bar stock: 1.0" x 0.125" (25.4mm x 3.2mm)

Float Switches:

- Connectors:
  - Quick release, dual seal
  - Black rubber boot for N.O. contact switch
  - Gray rubber boot for N.C. contact switch
- Cable: 18 gauge; 3 conductor SJOW
- Float:
  - Mechanically-activated; 10° above/10° below horizontal, internally weighted
  - Dimensions: 4.03" diameter x 6.62" (10.2 cm x 16.8 cm)
  - Material: Polypropylene
  - Weight: 1.9 lbs. (0.862 kg)
- Rating:
  - Maximum temperature: 140°F (60°C)
  - Min./Max. electrical load: 1mA, 4 VDC; 1 Amp, 125 VAC



ORDERING

PART NUMBER	DESCRIPTION
1053973	KwikSwitch™ 4-port Manifold w/ 25ft. cable
1053974	KwikSwitch™ 4-port Manifold w/ 50ft. cable
1053975	KwikSwitch™ 4-port Manifold w/ 100ft. cable
1053954	KwikSwitch™ Float, N.O. w/ 25ft. cable
1053955	KwikSwitch™ Float, N.C. w/ 25ft. cable
1053956	KwikSwitch™ Float, N.O. w/ 50ft. cable
1053957	KwikSwitch™ Float, N.C. w/ 50ft. cable
1054136	Sealing Plug*

**One sealing plug must be ordered for each unused port. Do not install manifold with open ports.*

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MJK Expert™ 2100 Level Transmitter

MJK Expert™ 2100 Level Transmitter is a very robust and useful all-round transmitter. It is one of the most used in MJK's transmitter program.

The transmitter is equipped with a piezoresistive measuring system with high precision and direct air pressure compensation through a vent tube in the cable.

Expert™ 2100 is ideal for measuring levels in storage tanks, wet wells and pump stations in both water and wastewater plants.

Specifications

MJK Expert™ 2100 Hydrostatic Level Transmitter				
Nominal measuring range (ftWG)	0 - 10 ft.	0 - 15 ft.	0 - 30 ft.	0 - 100 ft.
Measuring principle	Piezoresistive			
Min. programmable range	0 - 6 ft.	0 - 6 ft.	0 - 6 ft.	0 - 30 ft.
Max. programmable range	0 - 36 ft.	0 - 36 ft.	0 - 36 ft.	0 - 200 ft. ②
Non-standard range	Min. 0 - 6 ft. / Max. 0 - 900 ft.			
Max. overpressure	3.5 bar / 50 psi	3.5 bar / 50 psi	3.5 bar / 50 psi	10 bar / 150 psi
Temperature range	15 to 150 °F			
Temperature deviation, zero point	Better than ± 0.01 % / °F			
Temperature deviation, full range	Better than ± 0.008 % / °F			
Linearity / Stability	Better than ± 0.5 % FS / ± 0.1 % FS			
Measurement accuracy	Better than ± 0.25 % FS @ 50 to 85 °F Better than ± 0.5 % FS @ full temperature range			
Long time stability	Better than ± 0.5 % FS per year			
Materials	Housing: PP / Diaphragm: Stainless steel (AISI 316 L)			
Supply voltage	10 - 30 V DC (12 - 30 V DC for cable lengths above 315 ft.)			
Output signal	2-wire 4 - 20 mA (passive transmitter)			
Cable	2 x AWG 20 (pressure) + 5 x AWG 25 (data), shielded, PUR insulation			
Cable length ①	39 ft.	39 ft.	39 ft.	115 ft.
Enclosure	NEMA 6P, withstands a static pressure equal to max. overpressure			
Approvals	EN61000-6-3/-4:2001, EN61000-6-1/-2:1999			

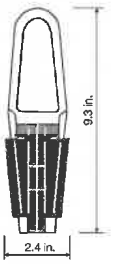
① *Can be delivered with other cable lengths on request.* ② *Can be delivered with up to 900 ft.*

Order Numbers

Order Numbers			
209930	Expert™ 2100, range 0 - 10 ft. WG	220291	Expert™ 2100 in special materials
209935	Expert™ 2100, range 0 - 30 ft. WG	202925	Expert™ 2100 w/ special meas.range
209940	Expert™ 2100, range 0 - 100 ft. WG		

Dimensions and Accessories

MJK model 2100 level transmitter

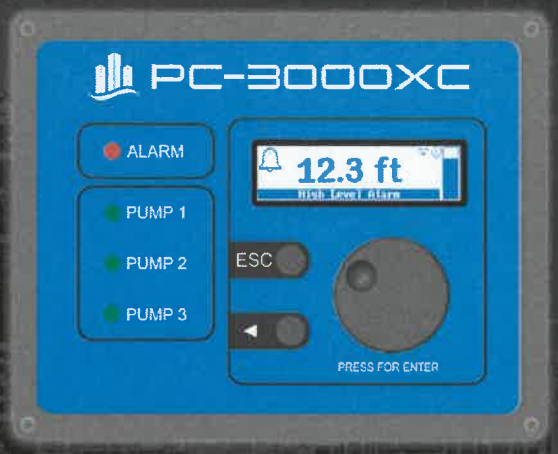


Cable bracket for MJK model 2100 (1 pc. is delivered with each transmitter)

MJK North America, Inc.
37 Sherwood Terrace, #126
Lake Bluff, IL 60044
Tel: 847-482-8655
877 MJK LINK
Fax: 847-482-8654
mjkusa@mjk.com
www.mjk.com

PC-3000XC

CONTROLLER WITH REMOTE COMMUNICATION



OVERVIEW

The PC-3000XC controller is designed to operate up to 3 pumps in pump up or pump down applications. The controllers sequence pumps ON and OFF in response to a change in level input. The easy-to-read blue OLED display provides the operating status, featuring fast and intuitive menu navigation and setup. The PC-3000XC provides for advanced communication functionality for integration to open architecture telemetry/SCADA systems.

FEATURES

- Configurable front panel; no programming software required
- Red LED indicates an active alarm
- Green LEDs indicate pumps required
- Multiple alternation/sequence configurations
- High visibility blue OLED backlit 64x256 pixel display
- Process/level displayed digitally and via bar graph
- Communications established indicator
- Built in pump failure detection
- Sensor failure detection with backup float switch to activate pump control override timer and alarm
- User selectable process/level units
- Level simulation, I/O, and relay output status screens to aid in setup and system troubleshooting
- Continuous level monitoring, 4-20 mA level sensor input
- Flow monitoring (volumetric)
- Modbus communication via RS-485 comm port
- Station design data

COMMUNICATION

- RS-485 terminal connections
- Modbus RTU protocol
- Designed to work with Pump Watch™ Express gateway remote monitoring system (default)

Advanced Communication
Full bidirectional communication SCADA interface and access to Modbus register addresses to include:

- Configurable node address
- Configurable baud rate
- Read/Write access to level set points
- Remote LEAD Pump selection
- Remote Pump Start
- Remote Pump inhibit
- Pump ETM and cycle counts
- Alarm counts
- And more

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PC-3000XC

CONTROLLER WITH REMOTE COMMUNICATION

SPECIFICATIONS

Pump Control and Monitoring:

- Automatic pump alternation: Simplex, Duplex or Triplex
- Pump alternation selection
- Pump over temperature monitoring
- Pump seal fail monitoring
- Pump run monitoring
- Pump fail to start monitoring
- Low-level and high-level alarms
- Flow monitoring (volumetric): inflow & discharge

System:

- Pump cycle counter
- Pump elapsed time meters
- Alarm counts
- Level simulation mode
- Selectable level measure units

Electrical:

- 24 VDC supply power (19-28 VDC, 325 mA max)
- Optional battery backup
- 6 Relay outputs (120 VAC, 3 A max)
- 4-20mA analog level input, 14-bit resolution
- 4-20 mA scalable analog level output 12-bit resolution
- 11 Digital Inputs (12 VDC, 16mA each

Serial Communication Port

- RS-485 3-wire
- Modbus RTU protocol
- Fixed: 1-stop bit, no parity, and 8 data bits
- Adjustable baud rate: 1200, 2400, 4800, 9600, 19,200, and 38,400
- Adjustable node address: 1-247

Mechanical:

- Overall dimensions: 7.2" x 5.3" x 2.0"
- Screen dimensions: 2.7" diagonal
- Panel Mount with 4 mounting holes
- Pluggable terminal blocks
- Fits legacy PC-3000 installations

Environment:

- Operating temperature: 0 to 50°C (32 to 122°F)
- Storage temperature: -20 to 60°C (-4 to 140°F)
- Relative humidity (RH): 5% to 95% (non-condensing)
- Indoor rated: for use indoors or mounted inside of an outdoor rated enclosure

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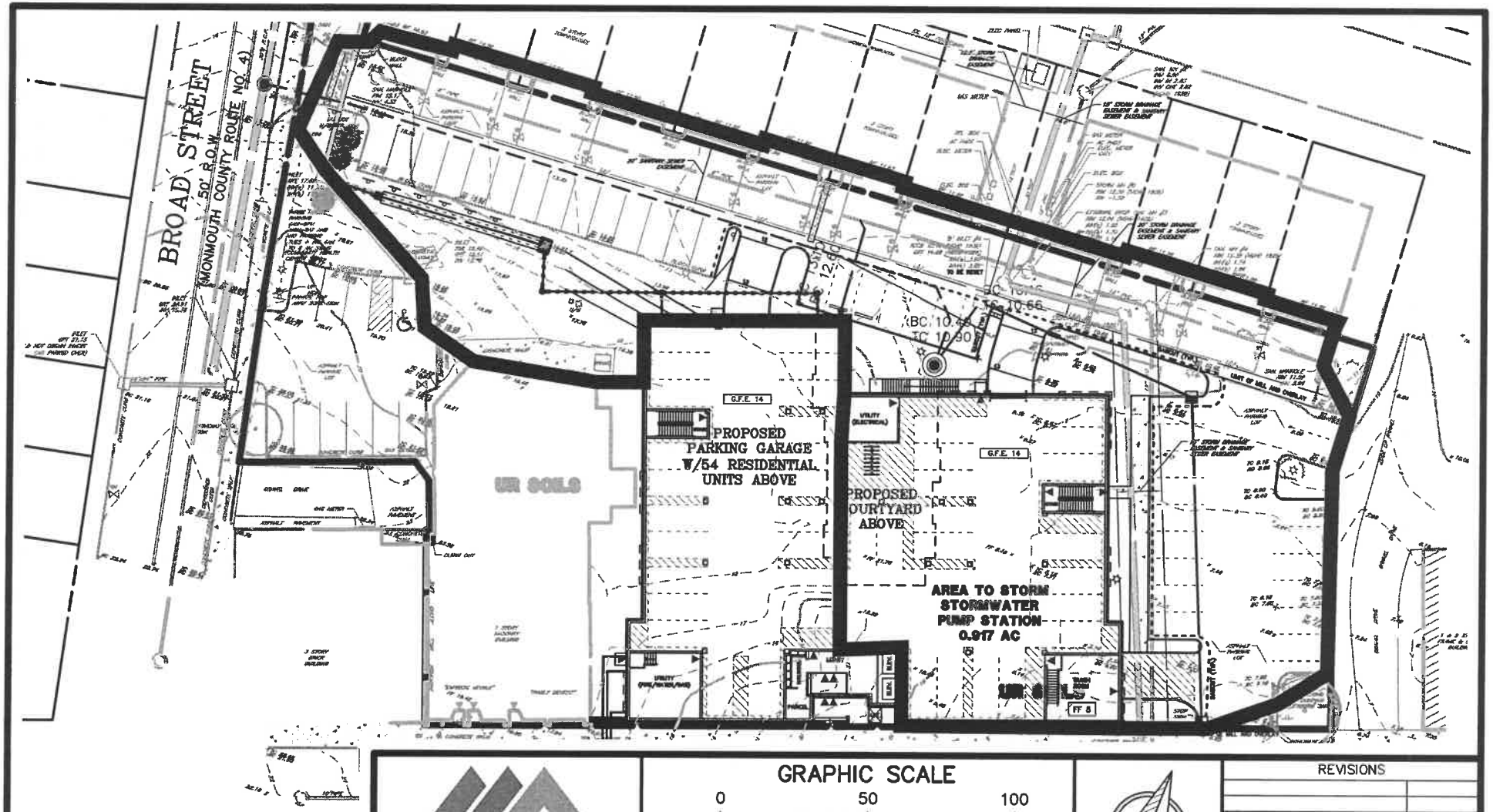


menlo engineering associates
Civil Engineering Consultants
Landscape Architects
Professional Planners
261 Cleveland Avenue
Highland Park, NJ 08904
732-846-8585 732-846-9439
Certificate of Authorization : 24GA27951900

GRAPHIC SCALE
0 50 100
25 75
SCALE: 1"=50'

REVISIONS

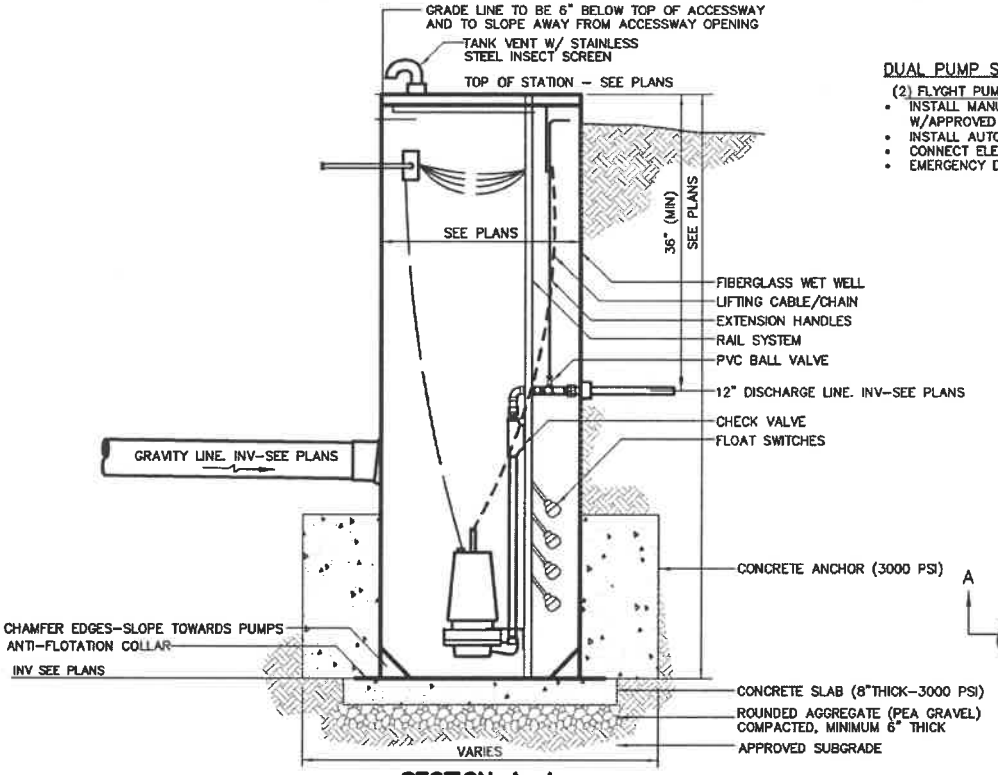
GULLS VIEW APARTMENTS

BOROUGH OF KEYPORT, MONMOUTH COUNTY, NEW JERSEY

AREA TO STOMWATER PUMP STATION

THIS WORK PREPARED UNDER MY IMMEDIATE SUPERVISION...

DRWN. BY	HC	DATE OF ISSUE	JOB # 2017.080.02
DSGN BY	HC	MAY, 28, 2021	DWG # APS-1
APPRD. BY	GSO	-	SHEET # 1



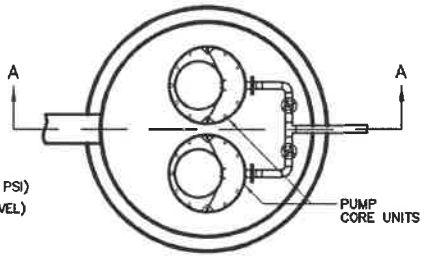
SECTION A–A

DUAL PUMP SYSTEM:

(2) FLYGHT PUMPS – NP 3202 MT 3~642, 3 PHASE, 35 HP, 230 VOLTS.

- INSTALL MANUAL CONTROLS, PROVIDING SHORT CIRCUIT AND OVERLOAD PROTECTION W/APPROVED HOUSING (TO BE LOCATED IN PROPOSED BUILDING).
- INSTALL AUTOMATIC LEVEL CONTROL #8.408 OR EQUAL.
- CONNECT ELECTRIC TO REMOTE JUNCTION BOX.
- EMERGENCY DISCONNECT TO BE LOCATED IN PROPOSED BUILDING.

ALL FIBERGLASS STRUCTURES TO BE DESIGNED FOR ANTI–FLOTATION. SHOP DRAWINGS TO BE PROVIDED BY CONTRACTOR PRIOR ORDERING



PLAN

STORM DUAL PUM SYSTEM

N.T.S.

menlo engineering associates
Civil Engineering Consultants
Landscape Architects
Professional Planners
261 Cleveland Avenue
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732–846–8585 732–846–9439
Certificate of Authorization : 24GA27951900

NOT TO SCALE

REVISIONS

THIS WORK PREPARED UNDER MY IMMEDIATE SUPERVISION...

GULLS VIEW APARTMENTS

BOROUGH OF KEYPORT, MONMOUTH COUNTY, NEW JERSEY

PUMP STATION DETAIL

DRWN. BY	HC	DATE OF ISSUE	JOB # 2017.080.02
DSGN BY	HC	MAY, 28, 2021	DWG # APS–2
APPRD. BY	GSO	–	SHEET # 2