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PEOPLE FOCUSED FUTURE

3002/24

January 17, 2024

Via Electronic Mail

RECEIVED
JAN 18 2024
DNREC
Division of Water

Department of Natural Resources
and Environmental Control
Division of Water, SWDS
89 Kings Highway
Dover, DE 19901

RE: Project No. 15737
Chandler Street Pumping Station

Dear DNREC Representative:

On behalf of the Artesian Wastewater Management, we are submitting an *Application for the Construction of Wastewater Collection and Conveyance Systems* for the referenced project.

This package includes the following items:

1. Completed Application for the Construction of Wastewater Collection and Conveyance Systems
2. Narrative summary
3. One set of final construction plans signed and sealed by a Delaware Registered Professional Engineer.
4. One set of draft technical specifications.
5. One electronic copy of the Construction Plans and technical specifications.
6. Calculations and pump/performance curves for the proposed pumping station.
7. A check made payable to the State of Delaware for $825.00 for the permit review fee.
8. A check made payable to the State of Delaware for $300.00 for the public notice fee.

We trust this information is sufficient for your review of the project application. If you need further information, please contact me at 302-489-2353 or at scondron@verdantas.com

Very truly yours,

VERDANTAS LLC

Shaun M. Condron
Project Manager

SMCL:rkm
Z:\Project Files\AA-BZ\ArtesiaWst\15737 - Artesian Front Street Pump Station Drywe\Working\Permits\DNREC\Application Letter 2024-01-17.docx

Department of Natural Resources
and Environmental Control
89 Kings Hwy
Dover, DE 19901
dnrec.delaware.gov

Division of Water
Commercial and Government Services Section

Phone: (302) 739-9946
Fax: (302) 739-8369

INSTRUCTIONS FOR COMPLETING THE PERMIT APPLICATION FOR THE CONSTRUCTION OF WASTEWATER COLLECTION AND CONVEYANCE SYSTEMS

The following items must accompany the application. **Please note that incomplete application packages will be returned in their entirety and not reviewed until such time as all required information is received.**

☒ 1. A narrative summary of the intended purpose and design of the proposed facilities.

☒ 2. One (1) set of final construction plans and specifications, if applicable, signed and sealed by a Delaware-registered Professional Engineer, or a Delaware-registered Professional Land Surveyor for gravity systems only. One (1) electronic copy of final Plans.

☒ 3. One (1) electronic copy of final Plans.

☒ 4. The final plans must be drawn to scale showing slopes, inverts, pipe types and sizes, existing and proposed ground surfaces, tops of manholes, water lines, stormwater and stream crossings, encasements shown in plan and profile, and other information if pertinent or requested.

☒ 5. For pump/lift stations and force mains, include all calculations and pump/performance curves.

☒ 6. A check made payable to the State of Delaware for eight hundred twenty-five dollars ($825.00), the non-refundable permit review fee. This fee covers the initial review and one follow-up review of any corrections or changes made to address the Division's comments. An additional eight hundred twenty- five dollars ($825.00) non-refundable review fee must be submitted for resubmission of the plans if changes are made to the project which trigger a complete review of the permit application.

☒ 7. Your permit will have a public notice requirement if your system includes force mains or pump/lift stations. Include a check made payable to the State of Delaware for three hundred dollars ($300.00) for the reimbursement of legal notices if the system has a force main connection or a pump/lift station.

☒ Please submit the completed application package, as outlined above, to DE DNREC, Division of Water, Commercial and Government Services Section, 89 Kings Highway, Dover, DE 19901. Please note, a new application, including the review fee, must be submitted if the Division's comments are not addressed or if requested supplemental information is not provided within one (1) year of the comment or request date.

☒ The following items must be submitted prior to permit issuance:

☒ 8. Verification from the appropriate county or municipal planning authority that the project has the proper zoning approval. N/A - Project involves improvements to an existing pumping station

☒ 9. A letter from the owner/operator of the wastewater facilities to which the proposed collection and conveyance facilities connect. The letter must include confirmation that the owner/operator has approved the project, that the owner/operator will take responsibility for treating and disposing of the wastewater to be conveyed and that the downstream facilities have the capacity to manage the additional flows without causing or contributing to violations of Delaware's Environmental Protection Act (7 Del. C., Chapter 60) and the regulations promulgated thereafter. This includes, but is not limited to, unauthorized discharges such as overflows at manholes and violations of the treatment system's operating permit (for example, the National Pollutant Discharge Elimination System (NPDES) permit).

- Visit us on the web at: https://dnrec.alpha.delaware.gov/water/surface-water/

N/A owner/operator of wastewater facilities is the applicant

APPLICATION FOR THE CONSTRUCTION OF
WASTEWATER COLLECTION AND CONVEYANCE SYSTEMS
Application must be complete, typewritten or clearly printed

Date Application Submitted _____

PROJECT INFORMATION			
Project Name and Location/ Address Chandler Street Lift Station Chandler Street, Milton, DE			
Tax Parcel Number(s) 235-14.19-179.00			
County ☐ Kent ☐ New Castle ☑ Sussex	Watershed (www.dnrec.delaware.gov/swc/wa/Pages/WatershedAssessment.aspx) ☐ Chesapeake Bay ☑ DE Bay/Estuary ☐ Inland Bays/Atl Ocean ☐ Piedmont		
Sewer District or Interceptor Artesian Wastewater Management, Inc.	Wastewater Treatment/Disposal Facility Name Milton Wastewater Treatment Plant		
Anticipated Construction Start Date June 2024	Treatment/Disposal Facility Owner and Operating Permit Number Artesian Sussex Regional Recharge Facility		
Please note, construction permits expire three (3) years from the date of permit issuance.			
Are you requesting plan review and comment or WPCC Construction Permit issuance? (circle one)			
Design Flow (gallons/day) Average 250,000	Peak 1,000,000	Peak Factor 4	Basis of Design Artesian & 10 State Standards
Description Wastewater pumping and conveyance system for an upgraded pumping station; refer to project narrative.			

OWNER/DEVELOPER		
Company Name Artesian Wastewater Management, Inc.		
Mailing Address 664 Churchmans Road		
City Newark	State DE	Zip 19702
Contact Name Mark Addison, P.E.		
E-Mail Address MAddison@artesianwater.com		
Telephone (302) 357-8721	Cell	Fax

ENGINEER

Company Name: Verdantas LLC.		
Mailing Address: 1060 S. Governors Ave. Suite 101		
City: Dover	State: DE	Zip: 19904
Contact Name: Steven H. Lewandowski, P.E.		
E-Mail Address: slewandowski@verdantas.com		
Telephone: (302) 489-2354	Cell:	Fax:

GRAVITY SEWER INFORMATION

Ownership: ☐ Public ☐ P	Type of Sewer System	If Other, list below
Type of Pipe		Velocity (ft/sec)
Minimum Pipe		anholes (ft)
Minimum ten f vertical separati: ☑ Yes ☐ No		
Explain any spe		, etc.)

NO GRAVITY SEWER IS PROPOSED WITH THIS APPLICATION

Comments

PUMP/LIFT STATION INFORMATION

Ownership	Type of Wastewater	If Other, list below
☐ Public ☑ Private	☑ Residential ☐ Commercial ☐ Industrial ☐ Other?	

Pump Station Flows (gallons/day) Design	Average	Peak	Peak Factor
1,000,000	250,000	1,000,000	4

Basis of Design	Pump Type
Artesian & 10 State Standards	Flygt Submersible

Will peak flows be accommodated if largest unit fails?	Pump calc's and pump curves attached?	Cycle Time (minutes)	Wet Well Detention Time (minutes)
☒ Yes ☐ No	☑ Yes ☐ No	7.57	5.69@ADF

Check valves provided on discharge line?	Gate valves provided on discharge line?
☒ Yes ☐ No	☒ Yes ☐ No

If not, explain alternate procedure:

Ventilation provided in wet well?	Dry Well?	Is an alarm system included?	Alternate source of power?
☒ Yes ☐ No	☐ Yes ☒ No	☒ Yes ☐ No	☑ Yes ☐ No

What other provisions for emergency operations?

Emergency Bypass System

Height of Influent Above Pump (suction head) (ft)	Height of Effluent Above Pump (discharge head) (ft)	Friction Loss (ft)
1 ft	45	97.1

Pump Design Point	Pump Operating Point	Static Head (ft)	Total Head (ft)	Required Motor Horsepower (hp)
700 gpm @142.1' TDH	704 gpm @143' TDH	45	142.1 TDH	50

FORCE MAIN INFORMATION

Type of Pipe	Length (ft)	Diameter (in)
Ductile Iron and PVC	+/-70 (see comments)	8

Hazen-Williams "C" Design Factor	Type of Joints	Velocity Under Design Conditions (ft/sec)	Minimum Pipe Cover (ft)
C=110, 140	Mechanical Joint, Bell Spigot	4.45	3.5

Air relief valves specified?	Clean-outs provided?	Maximum distance between clean-outs (ft)
☒ Yes ☐ No	☐ Yes ☒ No	N/A(see comments)

Minimum ten foot (10') horizontal & eighteen inch (18") vertical separation from water lines maintained?	If not, explain provisions to prevent cross-contamination:
☒ Yes ☐ No	

Comments

Force main information only provided for the proposed partial main improvements within the pump station footprint. The continuation of the force main and its alignment is being prepared by the owner under a separate permit application.

Chandler Street Pumping Station

Narrative Summary of Proposed Facilities

The Chandler Street Lift Station Upgrade project aims to enhance the efficiency and resilience of the existing wastewater conveyance system in the north side of Town. Currently, wastewater from this area flows to the Milton wastewater treatment plant. The wastewater treatment plant will be abandoned, and the wastewater redirected to Artesian Sussex Regional Recharge Facility. The proposed upgrade involves redirecting flow from the Front Street Pumping Station to the Chandler Street Lift Station through an existing force main across Wagamons Pond.

I. DESIGN STANDARDS

The wastewater pumping and conveyance system is designed in conformance with the following standards:

A. Artesian Construction Standards.

B. Recommended Standards for Wastewater Facilities ("Ten State Standards"), 2014 edition.

II. DEVELOPMENT DESIGN STANDARDS

1. **Demolition Work**: The existing pump station is a triplex configuration. The existing 3 pumps will be removed and replaced with 2 pumps(1 duty, 1 standby). The existing wet well will remain in use, the existing piping will be reconfigured, and a new valve vault installed adjacent to the existing structure.
2. **Improvements and Installations**:
    - Repair and inspection of concrete surfaces within the station, including the management of any identified spalling.
    - Sealing of any floor penetrations and the modification of floors for the installation of new systems.
    - The introduction of two new submersible pumps in the wet well, which are controlled based on water levels.
    - Installation of new valves, flow meters, and piping. Many of these will be situated in a below-ground enclosure outside of the lift station.

- Electrical upgrades which include new enclosures and a transfer switch, elevated to consider flood risks. A new generator will also be installed at the Elevated Water Storage Tank.
- An elevated platform, approximately 3-4 feet above the current ground level will be installed to withstand the risks associated with a 100-year flood event and will be connected to the existing platform through a walkway.

Project. No.		Milton Pump Sizing Scenario 4b: Chandler
Project:	Milton_Tie-in to SRRF	Pump Station to SRRF with total flow from Milton
Subject:	Chandler St. Pump TDH	

By:	MKA
Date:	9/20/2023

Route: Zigzag thru Milton to RT 16 to RT 30 to SRRF
Revised wet well water levels

Assumptions: Peak Factor = 3.7

Assume separate pipeline for this flow, 1 duty pumps + 1 standby

Neglect other flows in this pipeline Wire to Water Efficiency = 60%

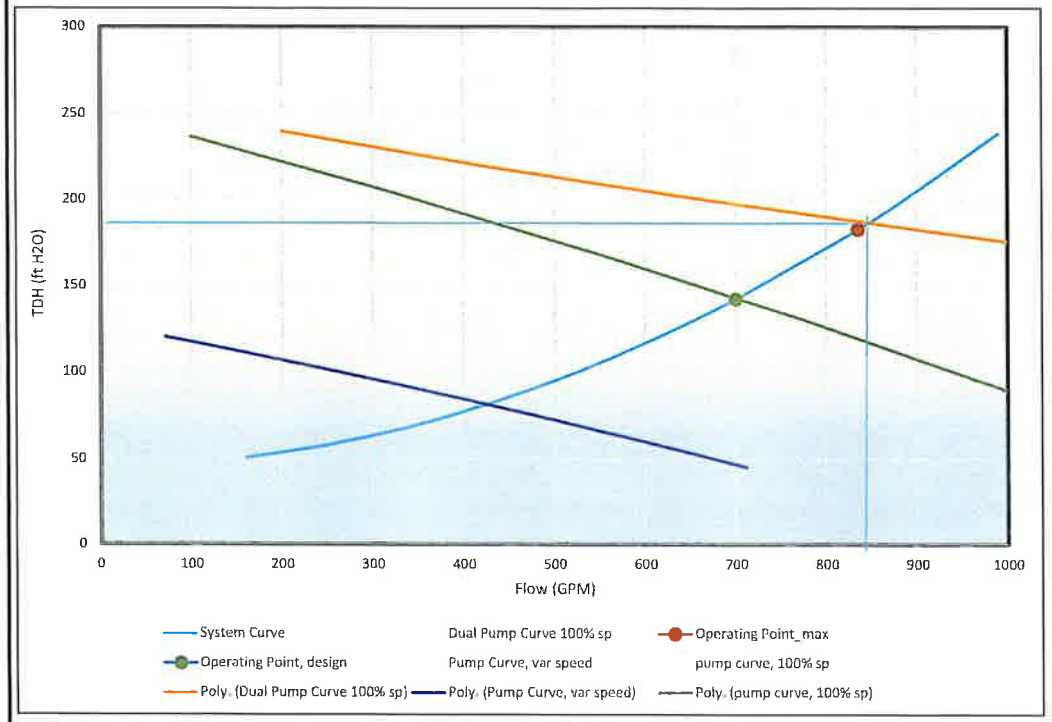
Existing Pumps: (3) 3 HP Hydromatic S300M4-4, 240 V 3 ph

Proposed Replacement: (2) 50 HP 230V Flygt NP-3202.095 for design flow

SPECIFIED CONDITIONS			Comments
Pressure (ambient)	14.7	psia	sea level
Inlet Pressure (P1)	0.00	psig	
Inlet Temperature	68	F	
Relative Humidity	36	%	
Discharge Pressure (P2)	0.00	psig	
Fluid	Water		
Discharge Density	62.4	lb/cf	
Inlet Density	62.4	lb/cf	
Inlet Flow Rate, Max.	835	GPM	Based on avg daily flow = 322000 gpd * peak factor
Inlet Flow Rate, Design	700	GPM	Based on avg daily flow = 250,000 gpd * peak factor
Mass Flow Rate, Max.	6964.84	lb/min	
Vapor Pressure of Water	0.33889	psia	

System Curve				
Flow Pt.	Q (GPM)	TDH (ft)	NPSHA (f	HP Reqd
1	160	50.5	35.2	5
2	250	57.8	35.2	7.5
3	340	68.3	35.2	10
4	430	81.9	35.3	20
5	520	98.8	35.3	25
6	610	118.8	35.4	40
7	700	142.1	35.5	50
8	835	182.9	35.6	60
9	900	205.1	35.7	100
10	990	238.6	35.8	125

2 Pumps on	
Q (GPM)	TDH (ft)
200	241.0
400	220.0
600	204.0
800	190.0
1000	178.0
1200	161.0
1400	143.0
1600	128.0
1800	109.0
2000	86.0



Pump & System Curves

50 HP 230V Flygt NP-3202.095

Pump Curve, N =	100%	
Flow Pt.	Q (GPM)	TDH (ft)
1	100	241.0
2	200	220.0
3	300	204.0
4	400	190.0
5	500	178.0
6	600	161.0
7	700	143.0
8	800	128.0
9	900	109.0
10	1000	86.0

	Speed	Hz
Pump Curve, N =	71.2%	42.72

Flow Pt.	Q (GPM)	TDH (ft)
1	71	122.2
2	142	111.5
3	214	103.4
4	285	96.3
5	356	90.2
6	427	81.6
7	498	72.5
8	570	64.9
9	641	55.3
10	712	43.6

Well 1 sp.cap.[b] =	0.0	gpm/ft	Motor Speed Control

Pump Motor Sizing						
Flow Pt.	η	BHP	Motor HP	FLA	Voltage	Phase
7	60%	41.9	50	65	460	3

1. Confirm η & FLA for selected pump
2. Some pumps require 1.5*FLA for VFD applications-confirm w/ manf.

Transformer Sizing					
Device	Phase	Voltage	Current	KVA	
Pump	3	460	97.5	77.7	
Pump	3	460	97.5	77.7	
Misc	1	120	125	15.00	
20% F.S.				34.1	
Total				204.4	
Next available size				225	KVA

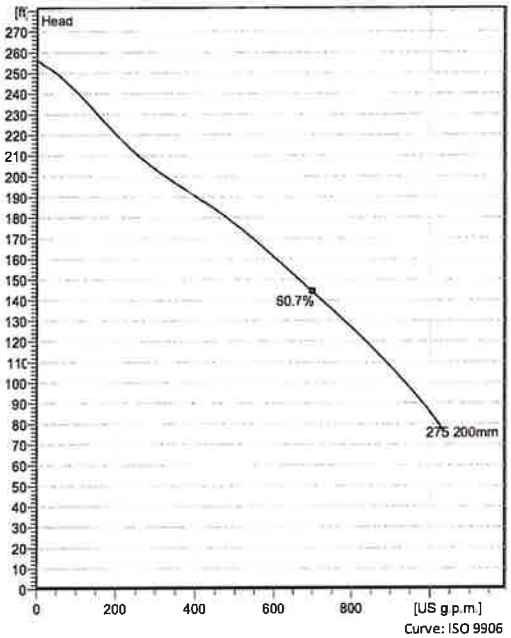
NP 3202 SH 3~ 275

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Modular based design with high adaptation grade.

FLYGT
a xylem brand

Technical specification

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Curve: ISO 9906

Configuration

Motor number
N3202.095 30-19-2AA-W 50hp

Installation type
P - Semi permanent, Wet

Impeller diameter
200 mm

Discharge diameter
4 inch

Pump information

Impeller diameter
200 mm

Discharge diameter
4 inch

Inlet diameter
150 mm

Maximum operating speed
3560 rpm

Number of blades
2

Max. fluid temperature
40 °C

Configuration

Material

Impeller
Hard-Iron ™

Project		**Created by**	AJ Wilson		
Block		**Created on**	1/9/2023	**Last update**	1/9/2023

NP 3202 SH 3~ 275

Technical specification

FLYGT a xylem brand

Motor - General

Motor number N3202.095 30-19-2AA-W 50hp	**Phases** 3~	**Rated speed** 3560 rpm	**Rated power** 50 hp
ATEX approved FM	**Number of poles** 2	**Rated current** 58 A	**Stator variant** 60
Frequency 60 Hz	**Rated voltage** 460 V	**Insulation class** H	**Type of Duty** S1
Version code 095			

Motor - Technical

Power factor - 1/1 Load 0.91	**Motor efficiency - 1/1 Load** 88.1 %	**Total moment of inertia** 3.54 lb ft²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.89	**Motor efficiency - 3/4 Load** 87.0 %	**Starting current, direct starting** 500 A	
Power factor - 1/2 Load 0.84	**Motor efficiency - 1/2 Load** 83.8 %	**Starting current, star-delta** 167 A	

Project		**Created by**	AJ Wilson		
Block		**Created on**	1/9/2023	**Last update**	1/9/2023

NP 3202 SH 3~ 275

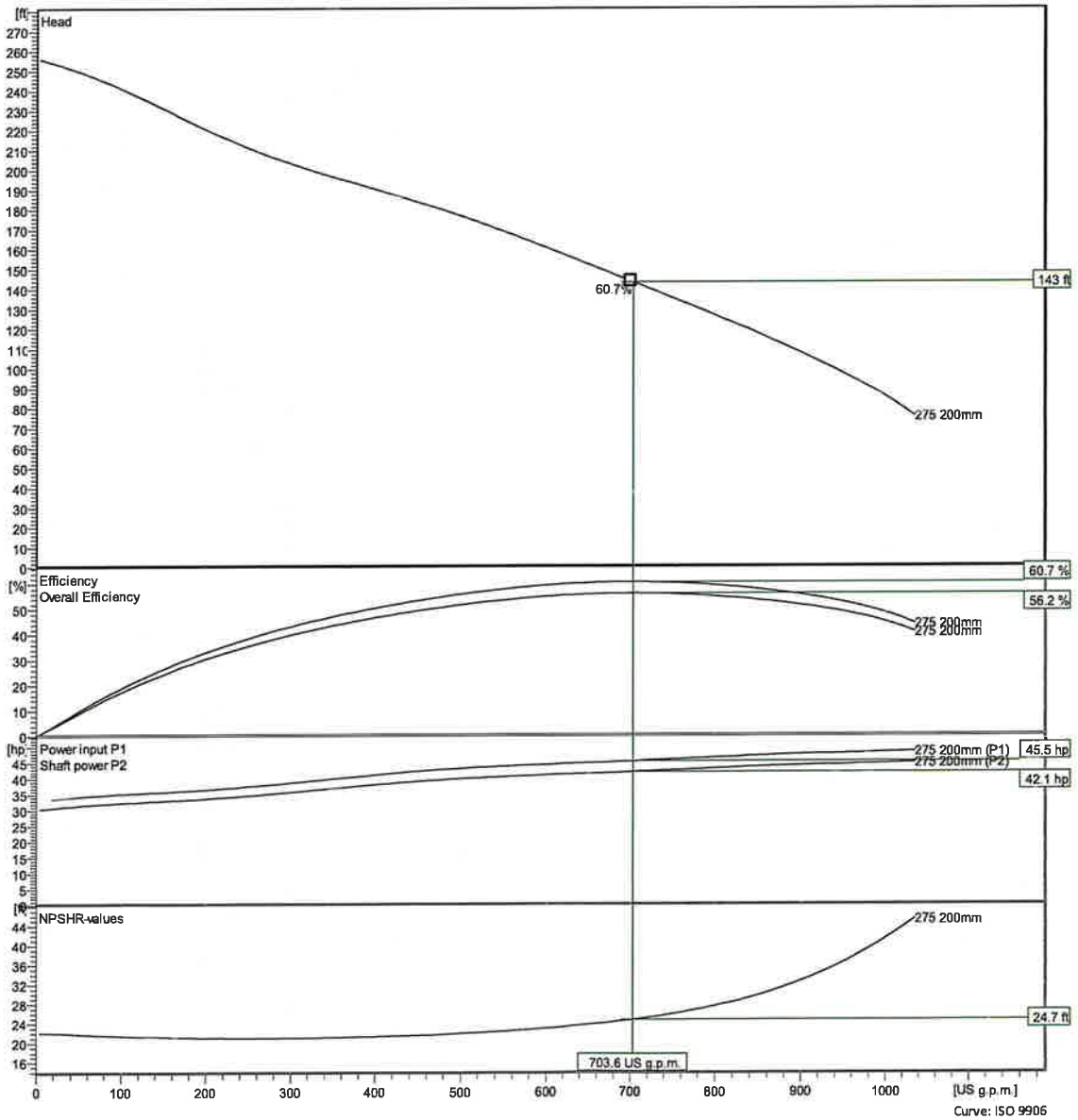
Performance curve

FLYGT
a xylem brand

Duty point

Flow	Head
704 US g.p.m.	143 ft

Curves according to: Water, pureWater, pure [100%],39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Curve: ISO 9906

AJ Wilson

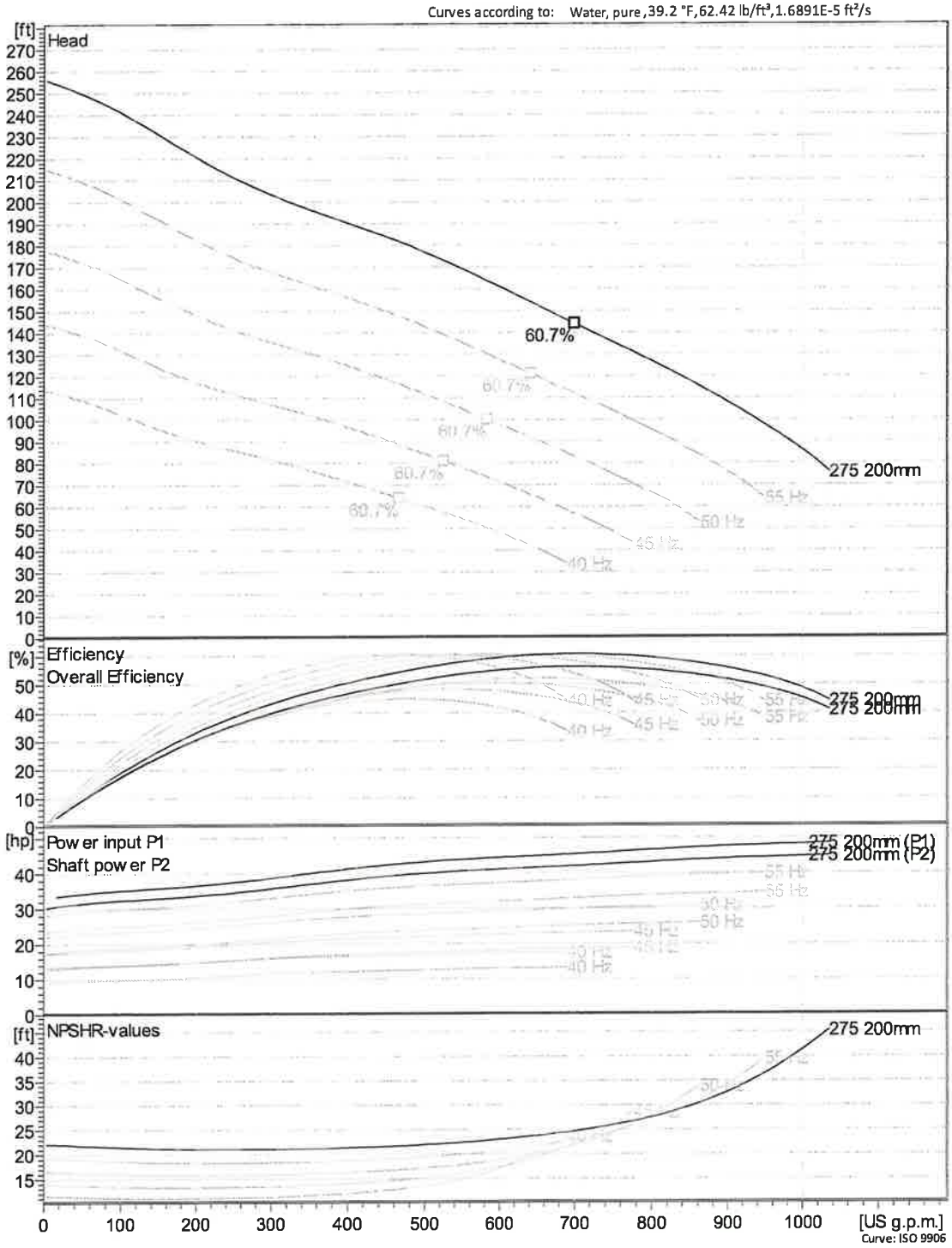
Created on 1/9/2023 **Last update** 1/9/2023

NP 3202 SH 3~ 275

VFD Curve

FLYGT
a xylem brand

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



Project

Block

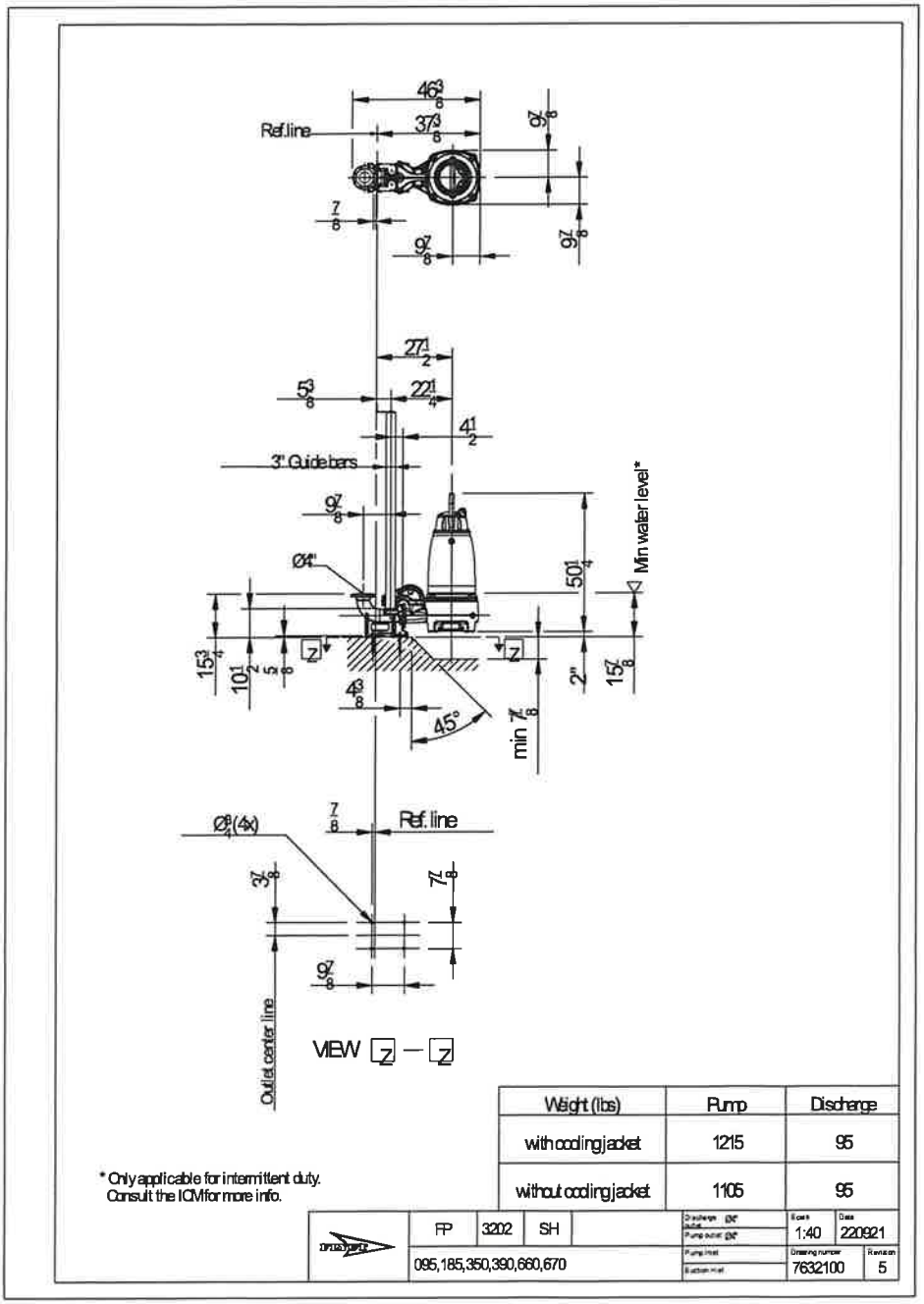
Created by AJ Wilson

Created on 1/9/2023 **Last update** 1/9/2023

NP 3202 SH 3~ 275

Dimensional drawing

FLYGT
a xylem brand



Weight (lbs)	Pump	Discharge
with cooling jacket	1215	95
without cooling jacket	1105	95

* Only applicable for intermittent duty.
Consult the ICM for more info.

FP	3202	SH			Scale 1:40	Date 220921
095,185,350,390,660,670				Drawing number 7632100		Revision 5

Project
Block

Created by AJ Wilson
Created on 1/9/2023 **Last update** 1/9/2023

RECEIPT

January 18, 2024 — **4**

RCVD FROM: TESI dba Artesian Wastewater — $825.00

Eight Hundred twenty-five dollars and 00/100 — DOLLARS

FOR: Plan review fee WPCC 3002/24 Chandler Street Lift Station

ACCT	$ 825.00	x	CHECK #	2103
PAYMENT	$ 825.00		CASH	
	$ -		OTHER	BY Kevin Bronson

DNREC, Surface Water Discharges Section, 89 Kings Hwy, Dover, DE 19901

RECEIPT

January 18, 2024 — **5**

RCVD FROM: TESI dba Artesian Wastewater — $300.00

DOLLARS

FOR: Three Hundred Dollars and 00/100

WPCC Legal Notice Reimbursement 3002/24

ACCT	$ 300.00	x	CHECK #	2102
PAYMENT	$ 300.00		CASH	
	$ -		OTHER	BY Kevin Bronson

DNREC, Surface Water Discharges Section, 89 Kings Hwy, Dover, DE 19901