

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

City of Moberly
Moberly WWTF
101 West Reed Street
Moberly, MO 65270

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo., and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources.

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

August 18, 2026
Effective Date

August 17, 2028
Expiration Date



Heather S. Peters, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed wastewater collection system extension will consist of 3 lift stations and associated force main that will carry raw wastewater to the receiving wastewater treatment facility.

Construction and installation of approximately 18,000 linear feet of 4-inch diameter polyvinyl chloride (PVC) Schedule 40 force main, 400 linear feet of 8-inch PVC gravity sewer, cleanouts and air release valves, and 3 duplex lift stations. The Moberly Mobile Home Park pump station's pumps are capable of operating at 151 gallons per minute (gpm) at 118 feet of total dynamic head (TDH). The Fox Hollow Mobile Home Park pump station's pumps are capable of operating at 179 gpm at 112 feet of TDH. The Heritage Hills pump station's pumps are capable of operating at 57 gpm at 179 feet of TDH. Each pump station will have a portable generator, and all necessary appurtenances to make a complete and usable wastewater collection system to serve an estimated population equivalent of 256 and an estimated design average flow of 25,600 gallons per day. The project will also include general site work appropriate to the scope and purpose of the project.

These activities will be in the vicinity of State Hwy JJ in Moberly, Randolph County and discharge to an existing sewer system to be treated at the Moberly Wastewater Treatment Facility, Missouri State Operating Permit No. MO-0117960.

II. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct, subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Jacobs Engineering which were signed and sealed by William Haag, P.E. on May 29, 2026, and February 19, 2026, respectively, and plans signed and sealed by Laura Anne Graser, P.E. on May 29, 2026, and approved by the department on August 18, 2026.
3. Regulation 10 CSR 20-4.040(18)(B)1 requires that projects be publicly advertised, allowing sufficient time for bids to be prepared and submitted. Projects should be advertised at least 30 days prior to bid opening.
4. The department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed project or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).
5. As per 10 CSR 20-4.040, all changes in contract price or time within the approved scope of work must be by change order in accordance with Section 19 of this rule.

6. Manholes shall be located with the top access at or above grade level.
7. State and federal law does not permit bypassing of raw wastewater; therefore, steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's electronic Sanitary Sewer Overflow/Bypass Reporting system at <https://dnr.mo.gov/mogem/> or Northeast Regional Office per 10 CSR 20-7.015(9)(G).
8. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(5), which includes by reference the provisions of 10 CSR 23-3.010. Separation distance requirements between water mains and sanitary sewers in 10 CSR 60-10.010 are also applicable.
9. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri State Operating Permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem>. See <https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting> for more information.
10. A United States Army Corps of Engineers (USACE) Section 404 Department of Army permit (§404) along with the department's Section 401 Water Quality Certification or waiver (§401) may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S., then a §404/§401 will likely be required. Since the USACE makes determinations on what is jurisdictional, you must contact the USACE to determine permitting requirements. See <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality> for more information or you may contact the department's Water Protection Program at 573-522-4502 or wpsec401cert@dnr.mo.gov.
11. If this project eliminates a wastewater treatment facility under the jurisdiction of the department, then a full closure plan shall be submitted with a Facility Closure Request Form [MO 780-2512](#) to the department's appropriate regional office for review and approval. In accordance with 10 CSR 20-6.010(12), the closure plan must meet the requirements outlined in Standard Conditions Part III of the Missouri State Operating Permit. Closure shall not commence until the submitted closure plan is approved by the department.
12. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements. Some of the requirements include:
 - A. Vacuum testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C1244 – 11(2017) *Standard Test Method for Concrete Sewer*

- Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill*, as approved and published April 1, 2017, or the manufacturer's recommendation. 10 CSR 20-8.120(4)(F)1.
- B. Exfiltration testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C969 – 17 *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines*, as approved and published April 1, 2017. 10 CSR 20-8.120(4)(F)2.
- C. Facilities shall be readily accessible by authorized personnel from a public right-of-way at all times. 10 CSR 20-8.130(3)(B).
- D. Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility: 10 CSR 20-8.130(3)(C).
- i. Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals; 10 CSR 20-8.140(8)(A)
 - ii. Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140(8)(B)
 - iii. First aid equipment; 10 CSR 20-8.140(8)(C)
 - iv. Posted "No Smoking" signs in hazardous areas; 10 CSR 20-8.140(8)(D)
 - v. Appropriate personal protective equipment (PPE); 10 CSR 20-8.140(8)(E)
 - vi. Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140(8)(F)
 - vii. 10 CSR 20-8.140(8)(G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
 - viii. 10 CSR 20-8.140(8)(H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
 - ix. Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140(8)(I)
 - x. Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate.; 10 CSR 20-8.140(8)(K)
 - xi. Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140(8)(L)
 - xii. Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E Standard for Electrical Safety in the Workplace (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140(8)(M)
- E. The distance between wastewater pumping stations and all potable water sources shall be at least 50 feet in accordance with 10 CSR 20-8.130(3)(D).

- F. Multiple pumps shall be provided except for design average flows of less than 1,500 gallons per day. 10 CSR 20-8.130(4)(B) 1.
- G. Electrical equipment. Electrical equipment shall be provided with the following requirements:
 - i. 10 CSR 20-8.130(4)(B)2.A. Electrical equipment must comply with 10 CSR 20-8.140(7)(B);
 - ii. Utilize corrosive resistant equipment located in the wet well; 10 CSR 20-8.130(4) (B)2.B.
 - iii. Provide a watertight seal and separate strain relief for all flexible cable; 10 CSR 20-8.130(4)(B)2.C.
 - iv. Install a fused disconnect switch located above ground for the main power feed for all pumping stations. 10 CSR 20-8.130(4)(B)2.D.
 - v. When such equipment is exposed to weather, it shall comply with the requirements of weather proof equipment; enclosure NEMA 4; NEMA 4X where necessary; and *NEMA Standard 250-2014*, published December 15, 2014. 10 CSR 20-8.130(4)(B)2.E.
 - vi. Install lightning and surge protection systems; 10 CSR 20-8.130(4)(B)2.F.
 - vii. Install a 110 volt power receptacle inside the control panel located outdoors to facilitate maintenance; 10 CSR 20-8.130(4)(B)2.G.
 - viii. Provide Ground Fault Circuit Interruption (GFCI) protection for all outdoor receptacles. 10 CSR 20-8.130(4)(B)2.H.
- H. Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130(4)(C)
- I. Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130(4)(D)
- J. Covered wet wells shall have provisions for air displacement to the atmosphere, such as an inverted and screened “j” tube or other means. 10 CSR 20-8.130(4)(E)
- K. There shall be no physical connection between any potable water supply and a wastewater pumping station, which under any conditions, might cause contamination of the potable water supply. If a potable water supply is brought to the station, no piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.130(4)(G)
- L. A portable pump connection on the discharge line with rapid connection capabilities shall be provided. 10 CSR 20-8.130(6)(B)2.
- M. Alarm systems with an uninterrupted power source shall be provided for pumping stations. 10 CSR 20-8.130(7)
- N. Where independent substations are used for emergency power, each separate substation and its associated distribution lines shall be capable of starting and operating the pump station at its rated capacity. 10 CSR 20-8.130(8)(B)

- O. Force main system shall be designed to withstand all pressures (including water hammer and associated cyclic reversal of stresses), and maintain a velocity of at least 2 feet per second. 10 CSR 20-8.130(9)(A)

13. Upon completion of construction:

- A. The City of Moberly will become the continuing authority for operation and maintenance of these facilities;
- B. Submit an electronic copy of the as-builts if the project was not constructed in accordance with previously submitted plans and specifications; and
- C. Submit the Statement of Work Completed form (<https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155>) to the department in accordance with 10 CSR 20-6.010(5)(N).

III. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

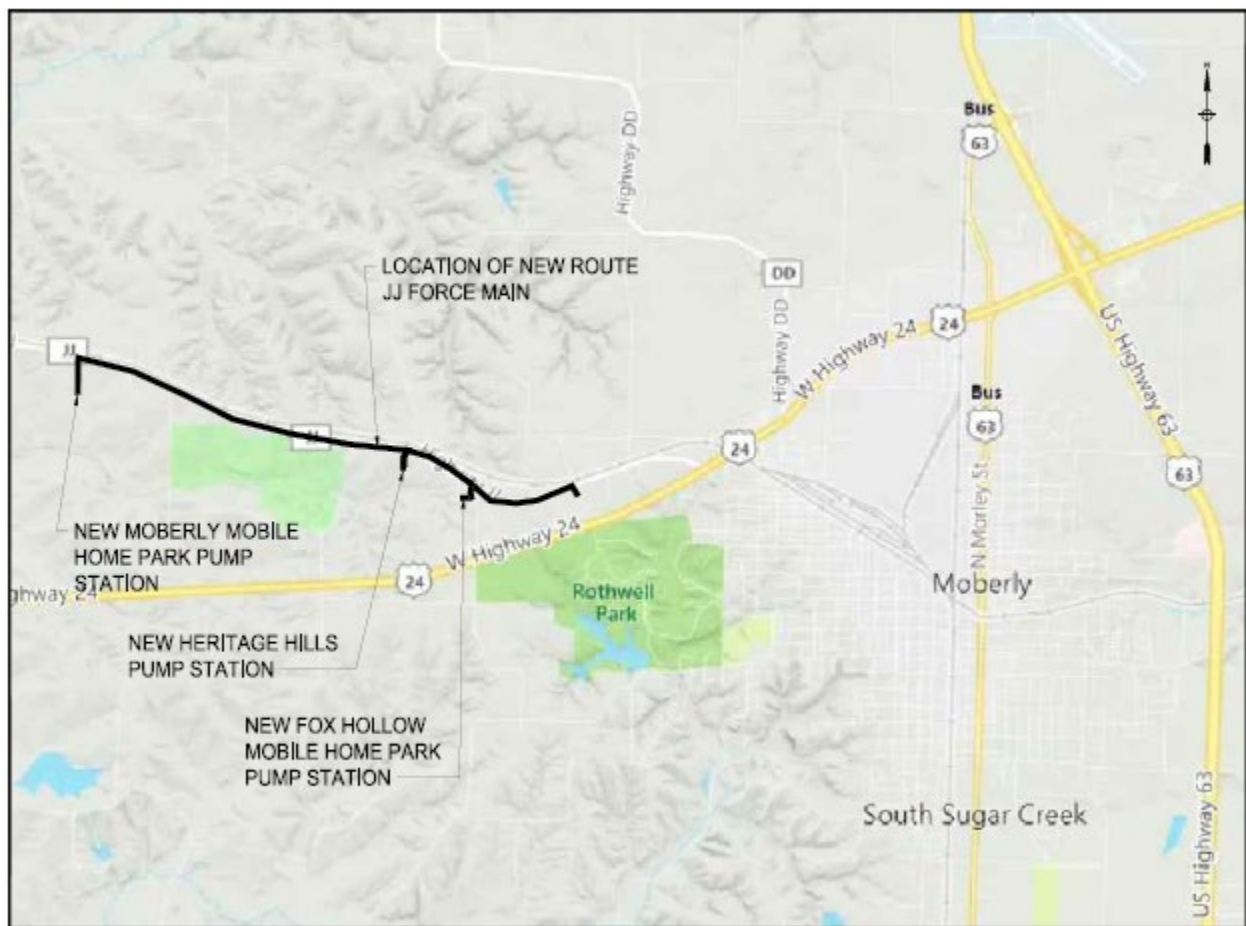
Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: <https://ahc.mo.gov>

Angie Garcia, P.E.
Financial Assistance Center
angie.garcia@dnr.mo.gov

APPENDICES

- APPENDIX 1 – MAP
- APPENDIX 2 – SUMMARY OF DESIGN

APPENDIX 1 — MAP



APPENDIX 2 — SUMMARY OF DESIGN

Route JJ Wastewater System Design Flo Calculations

Prepared by Jacobs Engineering

3-Jul-25

Using MDNR Design Guidelines

Guidelines	3 capita/unit
Mobile Homes	75 gal/day/capita

Bathrooms (Heritage Hills Golf Course)
Average Daily Flow (ADF) 5 gal/day/capita

Peaking Factor = $(18 + \sqrt{P}) / (4 + \sqrt{P})$
where P = Population in thousands

Previous iterations of these calculations assumed full build out of the mobile home parks and development around the Heritage Hills Golf Course. After further discussions with City officials, it is unlikely that there will be any development around the golf course and full build out of the mobile home parks is also unlikely. The population in the area has been flat or declining over the last 30 years. For these calculations, future flows were assumed at 20% higher than current flows as a safety factor unless otherwise noted.

Moberly Mobile Home Park

Presently, there are 19 trailers connected to the wastewater system. The most recent NPDES permit application (2021) noted there were 32 trailers connected with an actual flow of 5,200 gpd (NPDES permit states actual flow as 4,185 gpd). The owner indicated that they are bringing in and fixing up more trailers, with a maximum capacity of about 60 trailers. For design purposes, we are using 32 trailers present day and 40 trailers future.

	Present	Future
Units	25	40
Population	75	120
ADF	5,625 gal/day	9,000 gal/day
Peaking Factor	4.28	4.22
PDF	24,051 gal/day	37,989 gal/day

Heritage Hills Golf Course

Presently only the bathrooms at the golf course are connected. Using actual flows from NPDS permit for ADF and back calculating the population based on 5 gal/capita/day from design guidelines.

	Present	Future
Units	N/A	N/A
Population	57	68.4
ADF	285 gal/day	342 gal/day
Peaking Factor	4.30	4.29
PDF	1,226 gal/day	1,466 gal/day

Route JJ Wastewater System Design Flo Calculations

Prepared by Jacobs Engineering 3-Jul-25

Using MDNR Design Guidelines

Mobile Homes

3 capita/unit
75 gal/day/capita

Bathrooms (Heritage Hills Golf Course)

Average Daily Flow (ADF)

5 gal/day/capita

$$\text{Peaking Factor} = (18 + \sqrt{P}) / (4 + \sqrt{P})$$

where P = Population in thousands

Fox Hollow Mobile Home Park

Actual flow in NPDES permit is 7,500 gpd

	Present	Future
Units	33	40
Population	99	120
ADF	7,425 gal/day	9,000 gal/day
Peaking Factor	4.24	4.22
PDF	31,517 gal/day	37,989 gal/day

Pump Station	PDF (GPM)	Pump Off	Overflow*	Em. Storage (ft)	Diameter (ft)	Em. Storage Vol (gal)	2-hour PF Vol (gal)	% of 2- hour vol provided
Heritage Hills	27.4	779.17	787.92	8.749220294	8	3288	3288	100%
Moberly Mobile Home Park**	26.4	781.86	787.25	5.391509813	10	3166	3166	100%
Fox Hollow	26.4	845.93	854.35	8.424234083	8	3166	3166	100%

*Overflow assumed to be 6 inches below top of pump station

**Shale encountered at 778.2 feet. Use 10-ft diameter wet well to minimize rock excavation.



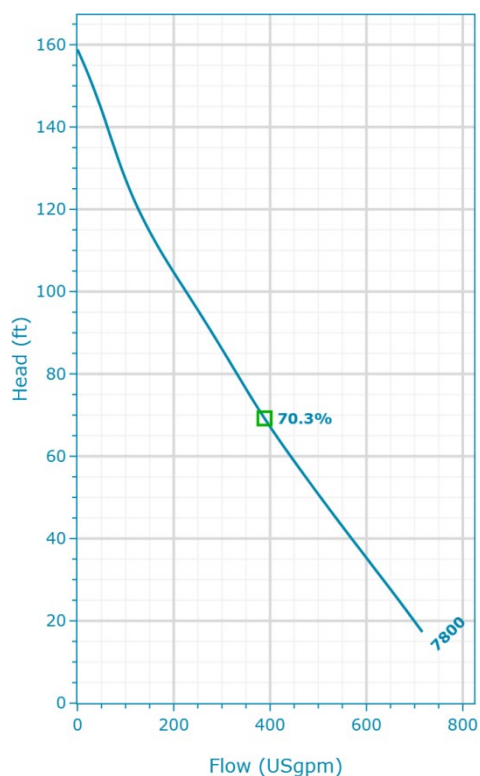
CONCERTOR 6020 XPC N80

Created On: 1/14/26

Concertor 6020 XPC N80 | Configuration



Concertor® is an intelligent wastewater pumping system that is designed to automatically deliver optimal pumping performance while at the same time significantly reducing the total cost of ownership.



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 additional performance guarantees.

GENERAL

Explosion Proof

No

Max. Pumped Media Temp.

104 °F

MATERIAL AND COATING

Impeller Material

Hard-Iron

Volute Material

Grey Cast Iron

Stator Cover Material

Grey Cast Iron

MOTOR

Rated Voltage

460 V

Rated Power

10 Hp

INSTALLATION

Installation Type

P - Semi-Permanent, Wet

Concertor 6020 XPC N80 | Product

Description

Flygt Concertor®

Achieve clog-free, energy-efficient wastewater pumping with Flygt Concertor®

Using advanced software functionality and state-of-the-art hardware, Concertor® protects against unscheduled downtime and creates significant energy savings for your pump station. Adaptive pump performance optimizes the operating point for each duty cycle, while self-cleaning functionalities clear potential blockages. Integrated intelligence also makes setup and operation quick and easy.

A scalable system

Add Xylem HMI + Nexicon®

Concertor XPC comes preprogrammed with wastewater pumping logic for lowest total cost of ownership. Continuous operational analysis minimizes energy use, and built-in sump and pipe cleaning reduce maintenance callouts.

Product Features

- IE4 equivalent permanent magnet motor
- Adaptive N® hydraulic system
- Always correct impeller rotation
- Advanced cooling system
- Flygt Plug-in seal with Active Seal system
- Long-life bearings
- Thermal sensors
- Leakage sensors
- Cable cut protection

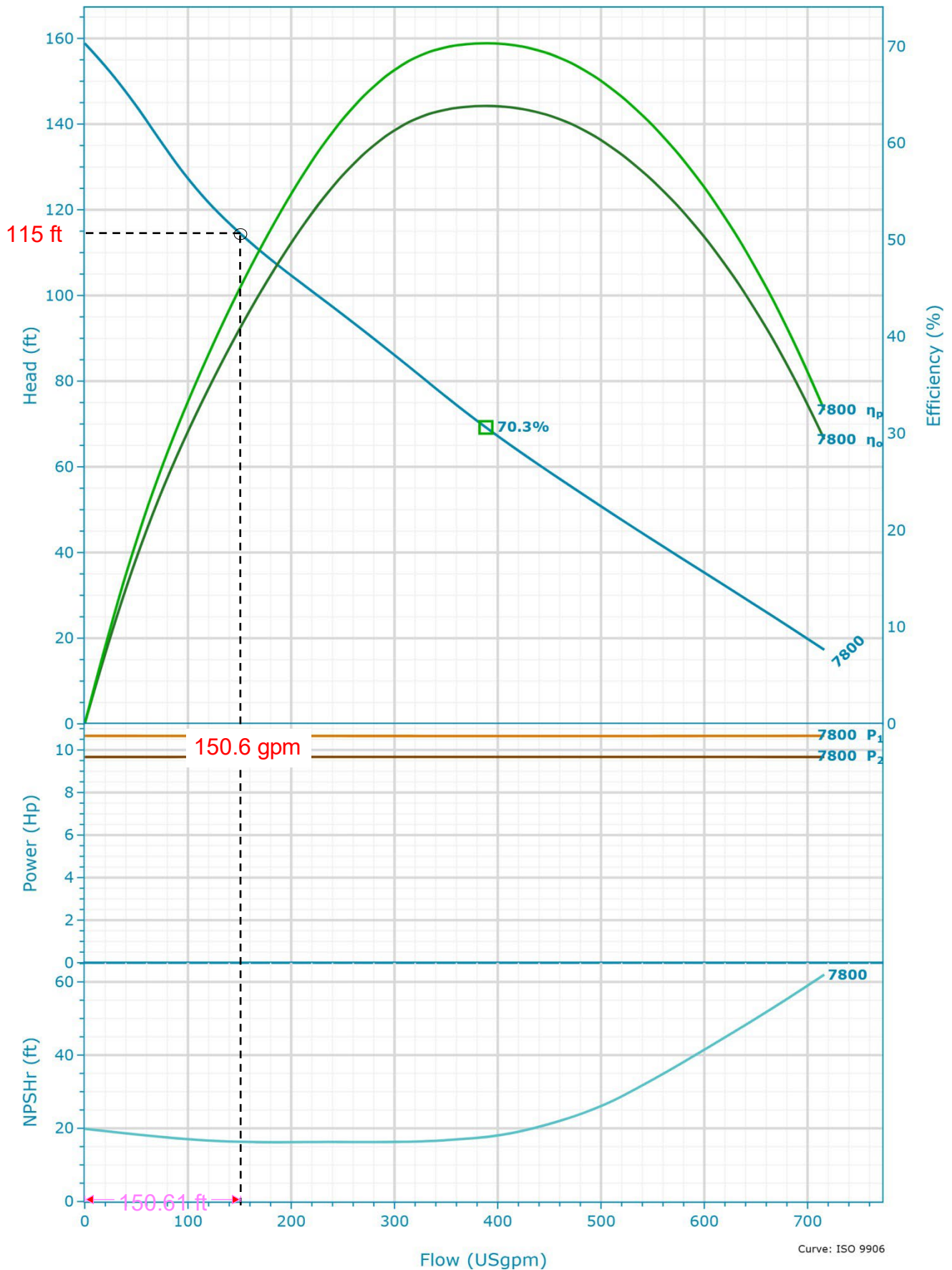
Construction Materials

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

Motor

Rated Power 10 Hp	Motor Max Speed 3,213 RPM	Motor Module 108	Efficiency 50% 90.81 %
Motor Denomination 18-08-1AZ	Rated Voltage 460 V	Locked Rotor Code A	
Version Code 182	Rated Current 10.57 A	Power Factor 100% 0.95	
Max P2 (1x) 9.67 Hp	Insulation Class H	Power Factor 75% 0.95	
Number Of Poles 10	Approval STD	Power Factor 50% 0.95	
Number Of Phases 3	Type of duty S1	Efficiency 100% 90.47 %	
Motor Min Speed 800 RPM	Stator Variant 1	Efficiency 75% 90.67 %	

Concertor 6020 XPC N80 | 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 additional performance guarantees.

Selection

Series
Concertor

Name
Concertor 6020 XPC N80

Frequency
60 Hz

System Type
Single Pump

Operating Pumps
1

Standby Pumps
No Standby Pump

Inlet Diameter
110 mm

Outlet Diameter
3 in

Number Of Vanes
2

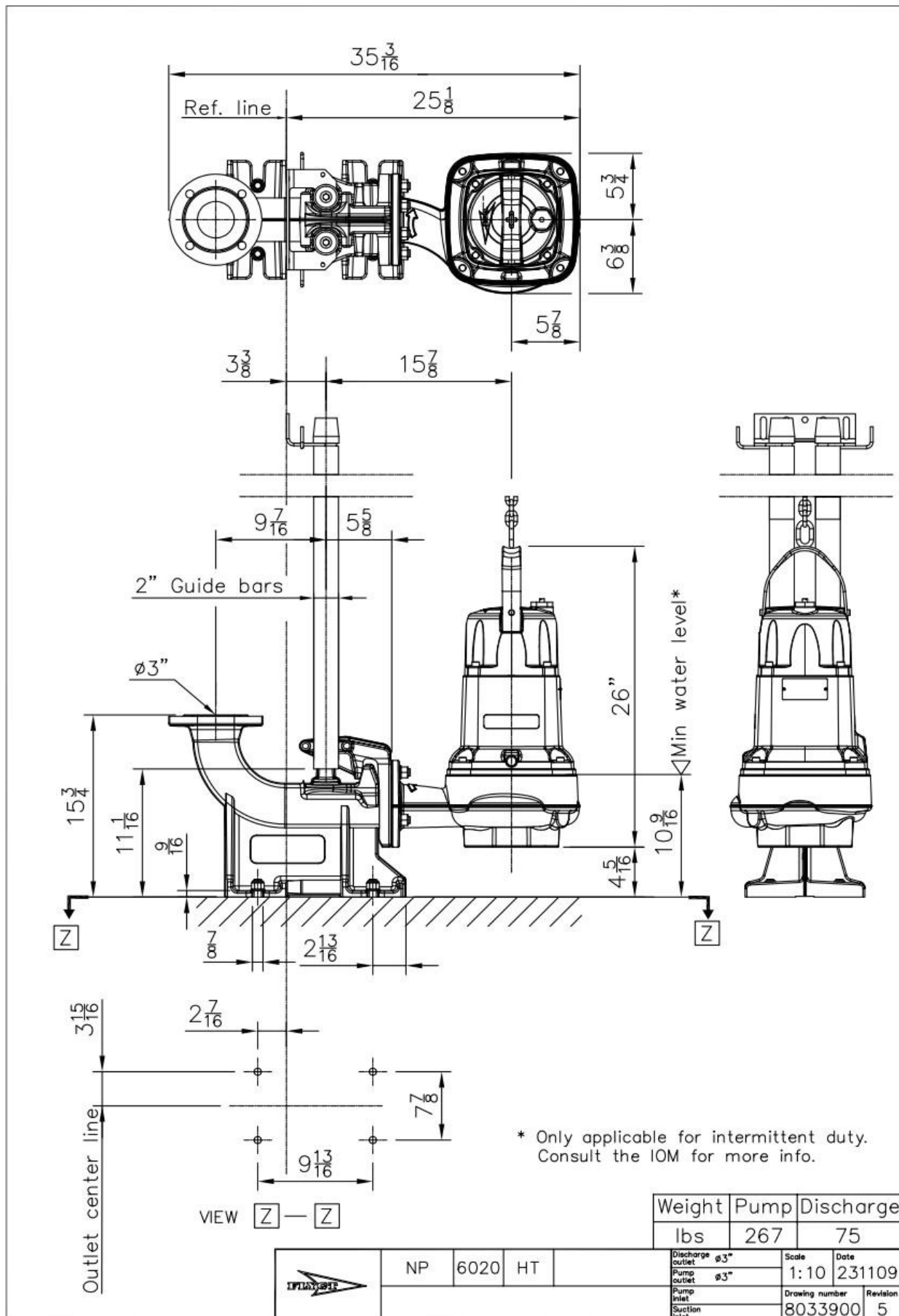
Fluid and Operating Conditions

Fluid Type	Density
Water	62.43 lb/ft ³
Fluid Temperature	Dynamic Viscosity
39.2 °F	1.57 cP
Specific Gravity	Fluid Vapor Pressure
1	0.12 psi
	Atmospheric Pressure
	14.7 psi
	Elevation
	0 ft
	Ambient Temperature
	68 °F
	NPSH Available
	33.68 ft
	Submergence
	0 ft

Design Curve

Max Flow	BEP Head
716.24 USgpm	69.2 ft
H@QMin	Max P2
158.86 ft	9.67 Hp
H@QMax	
17.3 ft	
BEP	
70.32 %	
BEP Flow	
388.54 USgpm	

Concertor 6020 XPC N80 | Dimensional Data & Drawing



Company	Jacobs Engineering
Contact	Ariel Richards
Phone No.	6418880524
Email	ariel.richards@jacobs.com



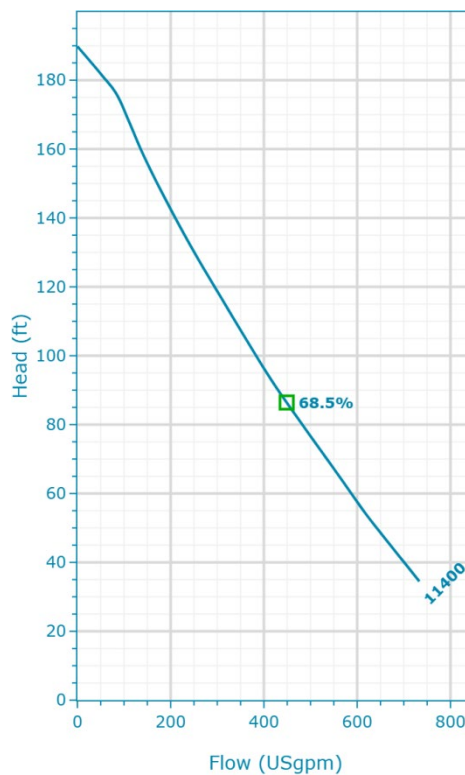
CONCERTOR 6030 XPC N80

Created On: 1/16/26

Concertor 6030 XPC N80 | Configuration



Concertor® is an intelligent wastewater pumping system that is designed to automatically deliver optimal pumping performance while at the same time significantly reducing the total cost of ownership.



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 additional performance guarantees.

GENERAL

Explosion Proof

No

Max. Pumped Media Temp.

104 °F

MATERIAL AND COATING

Impeller Material

Hard-Iron

Stator Cover Material

Grey Cast Iron

MOTOR

Rated Voltage

460 V

Rated Power

14 Hp

INSTALLATION

Installation Type

P - Semi-Permanent, Wet



Concertor 6030 XPC N80 | Configuration

Concertor 6030 XPC N80 | Product

Description

Flygt Concertor®

Achieve clog-free, energy-efficient wastewater pumping with Flygt Concertor®

Using advanced software functionality and state-of-the-art hardware, Concertor® protects against unscheduled downtime and creates significant energy savings for your pump station. Adaptive pump performance optimizes the operating point for each duty cycle, while self-cleaning functionalities clear potential blockages. Integrated intelligence also makes setup and operation quick and easy.

A scalable system

Add Xylem HMI + Nexicon®

Concertor XPC comes preprogrammed with wastewater pumping logic for lowest total cost of ownership. Continuous operational analysis minimizes energy use, and built-in sump and pipe cleaning reduce maintenance callouts.

Product Features

- IE4 equivalent permanent magnet motor
- Adaptive N® hydraulic system
- Always correct impeller rotation
- Advanced cooling system
- Flygt Plug-in seal with Active Seal system
- Long-life bearings
- Thermal sensors
- Leakage sensors
- Cable cut protection

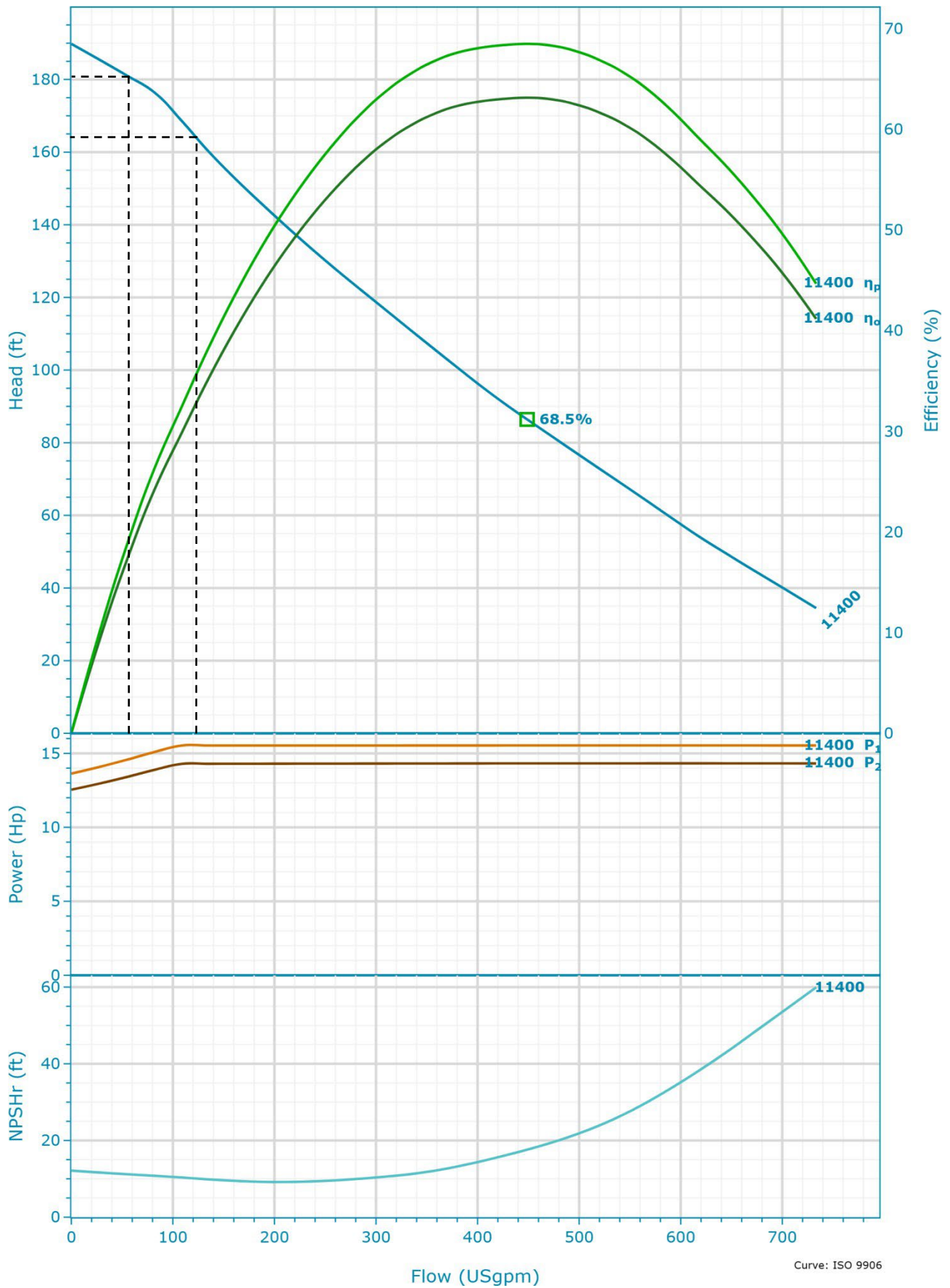
Construction Materials

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

Motor

Rated Power	Motor Max Speed	Motor Module	Efficiency 50%
14 Hp	3,000 RPM	154	91.72 %
Motor Denomination	Rated Voltage	Locked Rotor Code	
18-16-1AZ	460 V	A	
Version Code	Rated Current	Power Factor 100%	
180	15.45 A	0.94	
Max P2 (1x)	Insulation Class	Power Factor 75%	
14.33 Hp	H	0.94	
Number Of Poles	Approval	Power Factor 50%	
10	STD	0.94	
Number Of Phases	Type of duty	Efficiency 100%	
3	S1	92.08 %	
Motor Min Speed	Stator Variant	Efficiency 75%	
1,500 RPM	2	91.91 %	

Concertor 6030 XPC N80 | 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 additional performance guarantees.

Selection

Series
Concertor

Name
Concertor 6030 XPC N80

Frequency
60 Hz

System Type
Single Pump

Operating Pumps
1

Standby Pumps
No Standby Pump

Inlet Diameter
109 mm

Outlet Diameter
3 in

Number Of Vanes
2

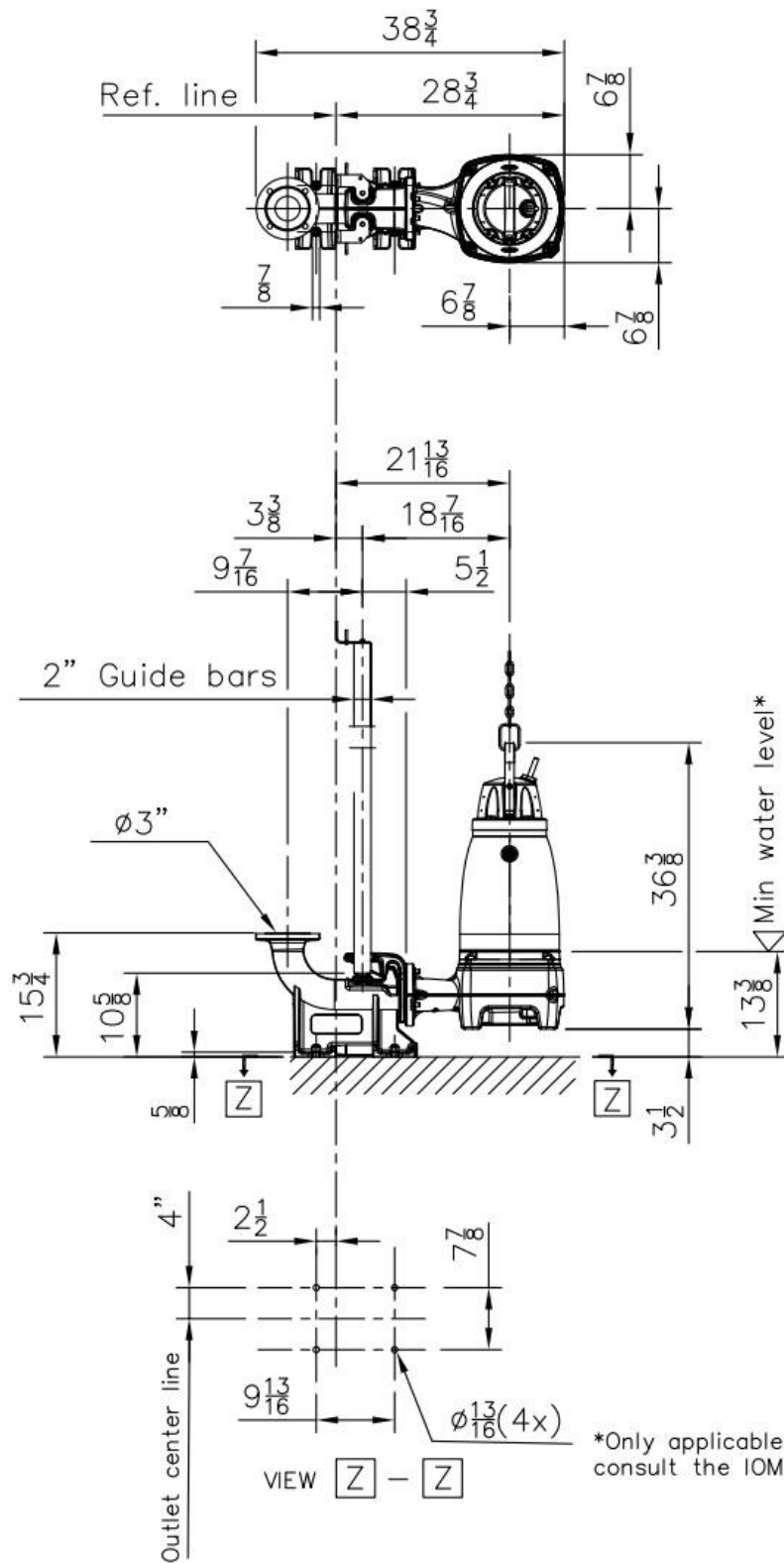
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Fluid Type	Density
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1	0.12 psi
	Atmospheric Pressure
	14.7 psi
	Elevation
	0 ft
	Ambient Temperature
	68 °F
	NPSH Available
	33.68 ft
	Submergence
	0 ft

Design Curve

Max Flow	BEP Head
733.33 USgpm	86.42 ft
H@QMin	Max P2
189.81 ft	14.33 Hp
H@QMax	
34.48 ft	
BEP	
68.51 %	
BEP Flow	
448.81 USgpm	

Concertor 6030 XPC N80 | Dimensional Data & Drawing



Weight (lbs)	
Pump	Discharge
490	80

Discharge outlet $\phi 3"$	Scale	Date
Pump outlet $\phi 3"$	1:20	240717
Pump inlet $\phi 6"$	Drawing number	Revision
Suction inlet	8719400	0



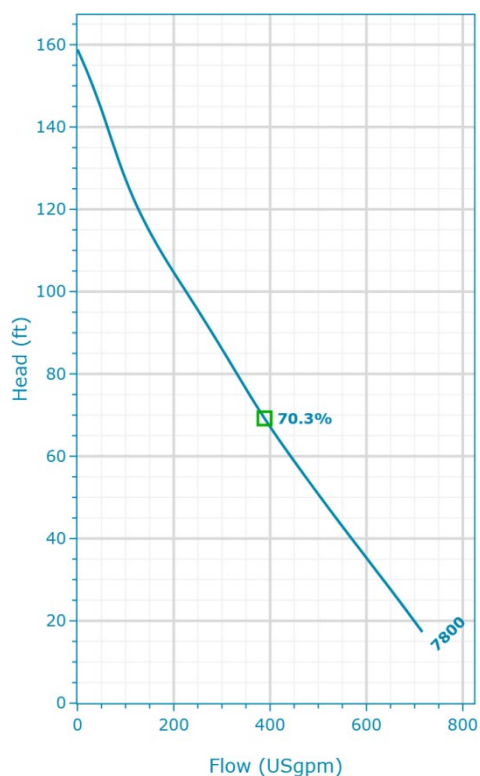
CONCERTOR 6020 XPC N80

Created On: 1/14/26

Concertor 6020 XPC N80 | Configuration



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GENERAL

Explosion Proof

No

Max. Pumped Media Temp.

104 °F

MATERIAL AND COATING

Impeller Material

Hard-Iron

Volute Material

Grey Cast Iron

Stator Cover Material

Grey Cast Iron

MOTOR

Rated Voltage

460 V

Rated Power

10 Hp

INSTALLATION

Installation Type

P - Semi-Permanent, Wet



Concertor 6020 XPC N80 | Configuration

Concertor 6020 XPC N80 | Product

Description

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Achieve clog-free, energy-efficient wastewater pumping with Flygt Concertor®

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A scalable system

Add Xylem HMI + Nexicon®

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Product Features

- IE4 equivalent permanent magnet motor
- Adaptive N® hydraulic system
- Always correct impeller rotation
- Advanced cooling system
- Flygt Plug-in seal with Active Seal system
- Long-life bearings
- Thermal sensors
- Leakage sensors
- Cable cut protection

Construction Materials

Impeller Material

Hard-Iron

Volute Material

Grey Cast Iron

Stator Cover Material

Grey Cast Iron

Motor

Rated Power

10 Hp

Motor Max Speed

3,213 RPM

Motor Module

108

Efficiency 50%

90.81 %

Motor Denomination

18-08-1AZ

Rated Voltage

460 V

Locked Rotor Code

A

Version Code

182

Rated Current

10.57 A

Power Factor 100%

0.95

Max P2 (1x)

9.67 Hp

Insulation Class

H

Power Factor 75%

0.95

Number Of Poles

10

Approval

STD

Power Factor 50%

0.95

Number Of Phases

3

Type of duty

S1

Efficiency 100%

90.47 %

Motor Min Speed

800 RPM

Stator Variant

1

Efficiency 75%

90.67 %

Project:
Concertor 6020 XPC

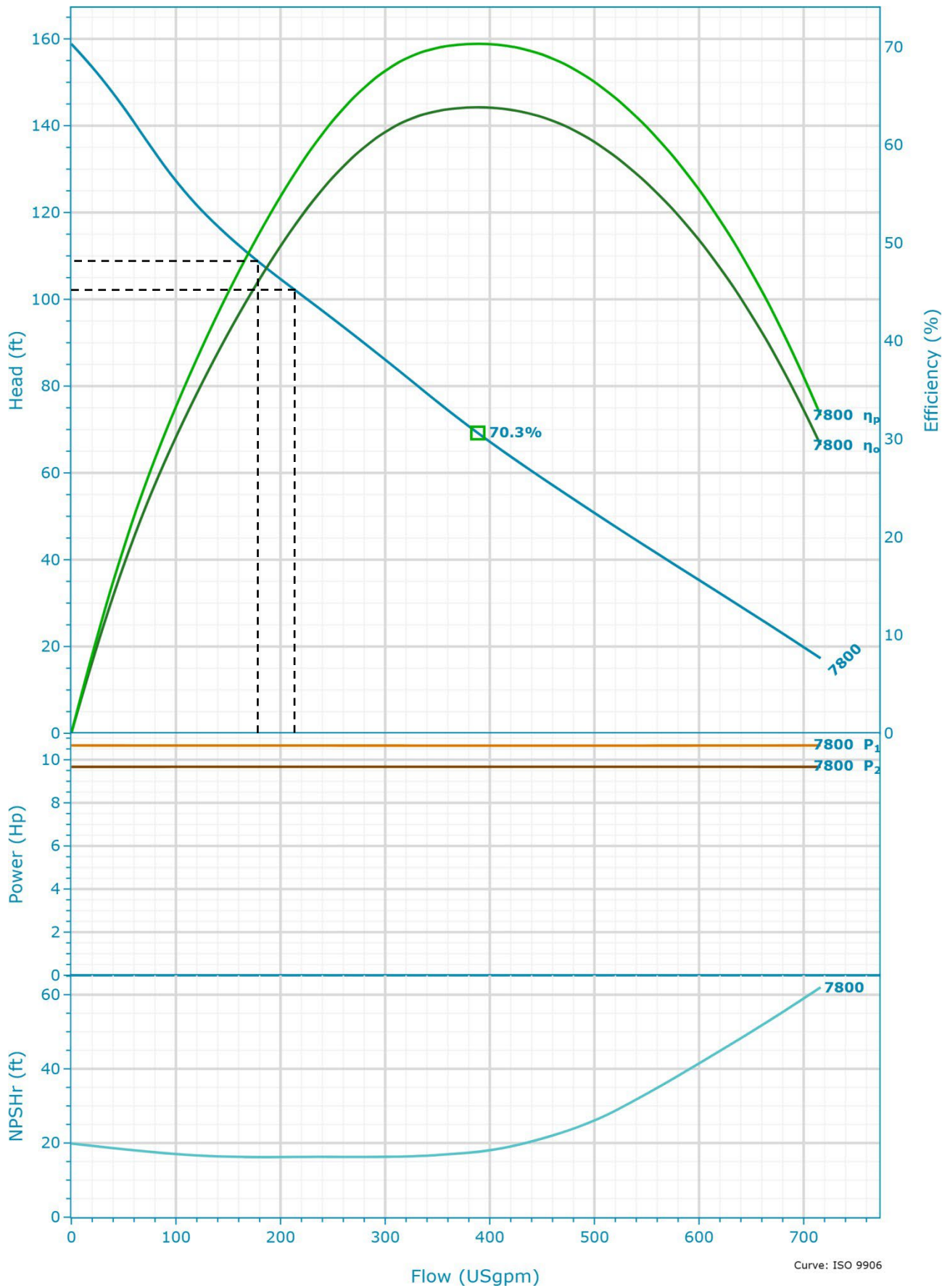
Created By:
Ariel

Created On:
1/14/26

Last Update:
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Concertor 6020 XPC N80 | Product

Concertor 6020 XPC N80 | 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 additional performance guarantees.

Selection

Series
Concertor

Name
Concertor 6020 XPC N80

Frequency
60 Hz

System Type
Single Pump

Operating Pumps
1

Standby Pumps
No Standby Pump

Inlet Diameter
110 mm

Outlet Diameter
3 in

Number Of Vanes
2

Fluid and Operating Conditions

Fluid Type
Water

Fluid Temperature
39.2 °F

Specific Gravity
1

Density
62.43 lb/ft³

Dynamic Viscosity
1.57 cP

Fluid Vapor Pressure
0.12 psi

Atmospheric Pressure
14.7 psi

Elevation
0 ft

Ambient Temperature
68 °F

NPSH Available
33.68 ft

Submergence
0 ft

Design Curve

Max Flow
716.24 USgpm

H@QMin
158.86 ft

H@QMax
17.3 ft

BEP
70.32 %

BEP Flow
388.54 USgpm

BEP Head
69.2 ft

Max P2
9.67 Hp

Project:
Concertor 6020 XPC

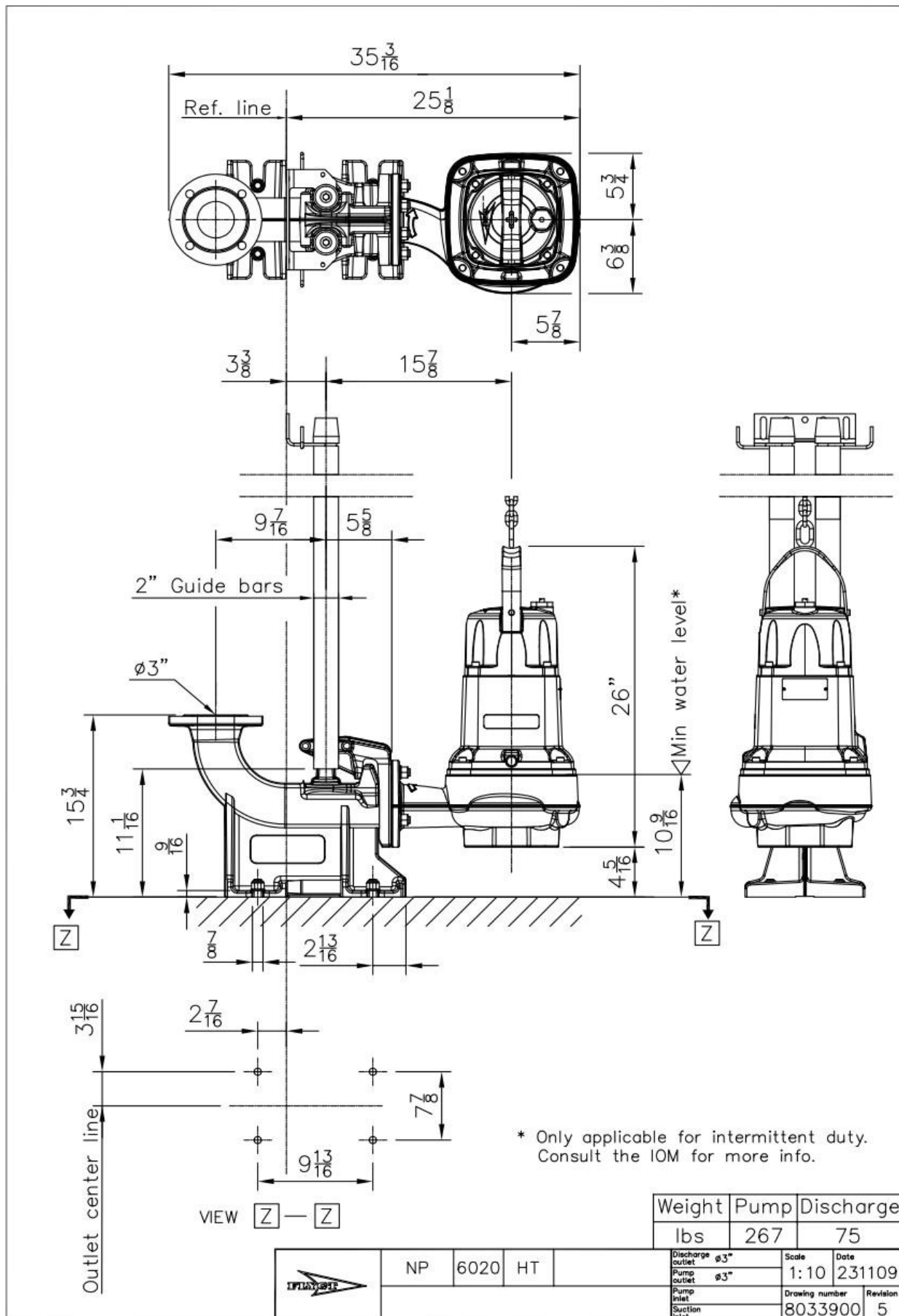
Created By:
Ariel

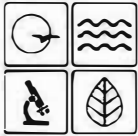
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1/14/26

Last Update:
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Concertor 6020 XPC N80 | Dimensional Data & Drawing





MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
**APPLICATION FOR CONSTRUCTION PERMIT –
SEWER EXTENSION**

FOR DEPARTMENT USE ONLY

APP NO.	CP NO.
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

NOTE ► Please Read the accompanying instructions before completing this form

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project? ☒ YES ☐ N/A Funding Agency: SRF Project #: C295854-01, C295648-03
- 1.2 Has the Department of Natural Resources approved the proposed project's engineering report*? ☒ YES Date of Approval: ☐ NO ☐ N/A
- 1.3 Is a copy of the appropriate plans* and specifications* included with this application? ☒ YES ☐ NO
If the project is using standard specifications, name of community: City of Moberly
- 1.4 Is a summary of design* included with this application? ☒ YES ☐ NO
- 1.5 Is the appropriate fee or JetPay confirmation included with this application? ☒ YES ☐ NO
See Section 7.0

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Route JJ Wastewater System

ADDRESS	CITY	STATE	ZIP CODE	COUNTY
101 West Reed Street	Moberly	MO	65274	Randolph

2.2 Legal Description: $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{4}$, Sec. , T , R

2.3 Project Components (check all that apply):

- ☒ Gravity sewers ☒ Pumping stations ☒ Force mains ☐ Alternative sewer system ☐ Other (Describe below.)

2.4 PROJECT DESCRIPTION

- A. Total number of manholes = 5 sewer manholes, 14 CARV manholes
- B. Size of sewers and the total linear feet of each size = 399 LF 8" Gravity Sewer.
- C. Number of lift stations and design average flow (ADF) and peak hourly flow (PHF) capacities of each lift station = 3 lift stations
- (1) Moberly Mobile Home Park: ADF = 11,300 gpd, PHF = 1884 gph
- (2) Heritage Hills: ADF = 6,000 gpd, PHF = 1,000 gph
- (3) Fox Hollow: ADF = 8,300 gpd, PHF = 1,384 gph
- D. Size and length of force mains. = 17,600 LF 4" FM

2.5 DESIGN INFORMATION

- A. Population or number of lots to be served by this extension: 276 people
- B. Estimated flow to be contributed by this extension: Design Average Flow: 25600 gpd Design Peak Hourly Flow: 4267 gph
- C. Industrial Wastes: Type: NA Flow: NA gpd
- D. Receiving Sewer: Size: 8 inches Capacity: 400 gpm
- E. Does this project (check all that apply):
- ☒ Connect to an existing treatment plant ☐ Resolve enforcement issue ☒ Eliminate or consolidate an existing treatment plant
- F. Estimated number of onsite systems being removed: 3
- G. Estimated costs associated with piping: \$ 1,192,000 Estimated costs associated with lift station(s): \$ 1,579,000

3.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS	
City of Moberly	(660) 269-8705	mbugalski@cityofmoberly	
ADDRESS	CITY	STATE	ZIP CODE
101 West Reed Street	Moberly	MO	65270

CHARTER NUMBER (SECRETARY OF STATE) or REGISTERED AGENT

4.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity, or person(s) that will be legally responsible for ensuring compliance with the permit requirements and provide continuous stable oversight of the permitted facility or activity. The Continuing authority should be a relatively permanent entity responsible for the ongoing operation, maintenance and modernization, when needed, of the permitted facility or activity. A continuing authority is not, however, an entity or individual that is contractually hired by the permittee to sample or operate and maintain the system for a defined time period, such as a certified operator or analytical laboratory. To access the regulatory requirement regarding continuing authority, 10 CSR 20-6.010(2), please visit [Clean Water Commission Chapter 6](#). A continuing authority's name must be listed exactly as it appears on the Missouri Secretary of State's (SoS's) webpage: [Missouri Secretary of State](#), unless the continuing authority is an individual(s), government entity, or otherwise not required to register with the SoS.

NAME City of Moberly		TELEPHONE NUMBER WITH AREA CODE (660) 269-8705	EMAIL ADDRESS mbugalski@cityofmoberly
ADDRESS 101 West Reed Street	CITY Moberly	STATE MO	ZIP CODE 65270
CHARTER NUMBER (SECRETARY OF STATE)			

4.1 Has appropriate continuing authority acceptance been provided as follows:

A letter from the continuing authority accepting responsibility for continued maintenance of the sewer (if the continuing authority is different than the original owner of the construction), or a properly executed "Continuing Authority and Receiving Wastewater Treatment Facility Acceptance" Form 780-2584. ☐ YES ☐ NO ☒ N/A

5.0 ENGINEER

ENGINEER NAME / COMPANY NAME Tobin Lichti, Jacobs Engineering Group, Inc.		TELEPHONE NUMBER WITH AREA CODE (314) 335-4550	EMAIL ADDRESS tobin.lichti@jacobs.com
ADDRESS 1001 Highlands Plaza Drive W, Suite 400	CITY St. Louis	STATE MO	ZIP CODE 63110

6.0 RECEIVING WASTEWATER TREATMENT FACILITY

NAME Moberly WWTP		TELEPHONE NUMBER WITH AREA CODE (660) 269-8705	EMAIL ADDRESS mbugalski@cityofmoberly
MISSOURI STATE OPERATING PERMIT # MO-0117960		COUNTY Randolph	REMAINING CAPACITY (GPD) 1,250,000

6.1 If different from the owner, has a letter been provided from the receiving treatment facility demonstrating that they agree to accept the expanded flow or has a properly executed Continuing Authority and Receiving Wastewater Treatment Facility Acceptance MO 780-2584 form been provided? ☐ YES ☐ NO ☒ N/A

6.2 A letter from the receiving wastewater treatment facility, if different than the continuing authority, is included with this application. ☐ YES ☐ NO ☒ N/A

6.3 If the receiving treatment plant or continuing authority is regulated by the Public Service Commission (PSC) for sewer activities, a Certificate of Convenience and Necessity has been received? ☐ Yes - Date: ☐ No ☒ N/A

OPTIONAL QUESTIONS REGARDING MILITARY SERVICE

Have you or an immediate family member ever served in the U.S. Armed Forces?	☐ Yes ☒ No
If yes, would you like information about military-related services in Missouri?	☐ Yes ☐ No

7.0 Application Fee

☐ Check Number	☒ JetPay Confirmation Number 20075652
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8.0 PROJECT OWNER: I certify under penalty of law this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE 		DATE
PRINTED NAME Michael Bugalski		
TITLE OR CORPORATE POSITION City Manager	TELEPHONE NUMBER WITH AREA CODE 660-269-7659	EMAIL ADDRESS mbugalski@cityofmoberly.com

Mail completed copy to:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
PO BOX 176
JEFFERSON CITY, MO 65102-0176

Submit completed electronic copy to:

Missouri Department of Natural Resources
at DNR.WPPEngineerSection@dnr.mo.gov

9.0 SEWER EXTENSION CHECKLIST				
SEWER EXTENSION DESIGN CERTIFICATION: Answer all questions yes or N/A. Answer N/A only if the question is clearly not applicable to the design of the proposed sewer extension.				
	REGULATION		YES	N/A
1.	8.110(3)(A)	Is the design flow based on actual flow data for an existing system?	☒	☐
2.	8.110(3)(B)	Are average design flows, peak hourly flows and I&I contributions for new systems calculated?	☒	☐
3.	8.110(9)(B)	Is there a detailed plan showing tributary area, boundaries, pertinent elevations, topography, existing and proposed facilities?	☒	☐
4.	8.120(2)	Does the sewer exclude water from roofs, streets, groundwater from foundation drains and combined wastewater?	☒	☐
5.	8.120(3)(A)	Is the pipe installation, embedment and backfill designed to prevent damage to the pipe and its joints?	☒	☐
6.	8.120(3) (A)1	Is all sewer pipe constructed with a slope to obtain mean velocities of not less than 2 feet per second?	☒	☐
7.	8.120(3)(A)2	Is the pipe covered with at least 36" of soil or sufficiently insulated to prevent freezing?	☒	☐
8.	8.120(3)(B)	Is deflection testing specified to ensure no pipe exceeds a deflection of 5% of the inside diameter?	☒	☐
9.	8.120(4)(A)	Are manholes located at the end of each line, at all changes in grade, size or alignment and at all intersections?	☒	☐
10.	8.120(4)(C)	Are manholes at least 42 inches in diameter with a clear opening of 22 inches on sewer line larger than 8"?	☒	☐
11.	8.120(4)(C)	Where cleanouts are used at the end of a lateral instead of a manhole, they are a minimum diameter of 8 inches or larger and equal to the diameter for pipes < 8"?	☒	☐
12.	8.120(4)(E)	Are the manholes watertight, constructed and installed in accordance with the manufacturer's recommendations and procedures?	☒	☐
13.	8.120(4)(F)	Do the specifications include a requirement for inspection and testing for manholes?	☒	☐
14.	8.120(5)(A)	Is the sewer free from physical connections to a potable water supply system and no water pipes come in contact with a sewer manhole?	☒	☐
15.	8.120(5)(B)	Are sewers and manholes located at least 50 feet horizontally from any existing or proposed water supply well, sources, structures?	☒	☐
10.0 PRESSURE SEWERS, GRINDER PUMP, STEP AND STEG SEWER CHECKLIST				
	REGULATION		YES	N/A
16.	8.125(5)(A)1.	Does the cleaning velocity of ≥ 2 ft/s happen more than once per day?	☒	☐
17.	8.125(5)(A)2.	Is the diameter of the pressure sewer main pipe at least 1.5"?	☒	☐
18.	8.125(5)(B)	Are appurtenances compatible with the piping system?	☒	☐
19.	8.125(5)(B)2.	Are isolation valves located: upstream of major pipe intersections; both sides of stream, bridge and RR crossings; at terminal end of system?	☒	☐
20.	8.125(5)(C)	Do service line pipes have a minimum diameter of 1.25"?	☐	☒
21.	8.125(5)(D)1.A .	Do simplex grinder pump stations service only a single equivalent dwelling unit (EDU)? i.e. 1 residence – 1 grinder pump.	☐	☒
22.	8.125(5)(D)1.B .	Are multiple unit pump stations owned, operated and maintained by an approved continuing authority?	☒	☐
23.	8.125(5)(D)3.	Is there at least 70 gallons of storage in the grinder pump unit?	☐	☒
24.	8.125(5)(D)4.	Do grinder pump stations have shutoff valves, check valves and anti-siphon valves (where siphoning could occur) that are accessible from the ground surface?	☐	☒
25.	8.125(5)(D)7., 8.130(3)(B)2.	Are units serviceable and replaceable under wet conditions without electrical hazard and is electrical equipment suitable for hazardous locations (National Electrical Code, Class I, Group D, Division 1 location)?	☒	☐
26.	8.125(5)(D)8., 8.125(2)(F)6.	Are provisions in place to avoid interruption of service due to mechanical or power failure by providing standby power, storage capacity, or interconnection with another disposal system?	☒	☐
27.	8.125(6)(D)	In a STEP system is at least one septic tank (1,000 gallons or more) provided for each EDU with 20% of tank volume dedicated to freeboard and ventilation?	☐	☒
28.	8.125(6)(F)	Are duplex pumps provided for the design flow of 1,500 gallons or greater?	☒	☐

11.0 PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
29.	8.125(7)(C)	Is the minimum diameter sewer main pipe and service line of STEG sewer at least 4"?	☒	☐
30.	8.130(2)(A) 8.140(2)(B)	Is the pump station designed to withstand the 100-year flood?	☒	☐
31.	8.130(3)(A)	Is the dry well completely separate from the wet well and is a suitable and safe means of access provided to each?	☐	☒
32.	8.130(3)(B)	If the design flow is 1,500 gpd or more, are there at least 2 pumps or pneumatic ejectors provided?	☒	☐
33.	8.130(3)(D)	Are valves located outside wet well unless integral to a pump or its housing?	☒	☐
34.	8.130(3)(F) 8.140(8)(J)	Do wet and dry wells have separate ventilation systems?	☐	☒
35.	8.130(3)(G)	Does all potable water brought to pump stations comply with 8.140(7)(D)?	☐	☒
36.	8.130(6)	Is an alarm system provided with uninterrupted power?	☒	☐
37.	8.130(7)(A)	Is there 2 hours retention of the peak hourly flow for a design flow > 100,000 gpd or 4 hrs retention of the peak hourly flow for a design flow < 100,000 gpd?	☒	☐
38.	8.130(7)(B)	Are there independent utility substations provided for emergency power capable of starting and operating the pump station at its rated capacity?	☒	☐
39.	8.130(8)(A)	Is the force main velocity of ≥ 2 ft/s maintained?	☒	☐
40.	8.130	Are there complete operation instructions for the pumping stations provided that include emergency procedures, maintenance schedules, special tools and spare parts that may be necessary?	☒	☐
12.0 SUCTION LIFT PUMP AND SUBMERSIBLE PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
41.	8.130(4)	Are the suction lift pumps of the self priming or vacuum priming type?	☐	☒
42.	8.130(4)(A)	Is the combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions less than or equal to 22 feet?	☐	☒
43.	8.130(4)(B)	Are there dual vacuum pumps capable of removing air from the suction lift pump?	☐	☒
44.	8.130(5)(A)	Are submersible pumps readily removable and replaceable without personnel entering, or disconnecting any pipe in the wet well?	☒	☐
13.0 SEWER EXTENSION CHECKLIST -- CERTIFICATION STATEMENT				
For any questions answered "N/A" provide an explanation. Also provide any useful general comments regarding design for review engineer.				
Project is for a submersible pump station. No grinder pumps or service lines are included in the project.				
Missouri Professional Engineer's seal, signature and date:				
March 4, 2026				
Name: Tobin Lichti				
Address: 1001 Highlands Plaza Drive W, Suite 400				
City: St. Louis		State: MO		ZIP Code: 63110
Telephone Number with Area Code: (314) 335-4550			Email: tobin.lichti@jacobs.com	