

ELECTRIC SERVICE POLE DETAIL  
N.T.S.

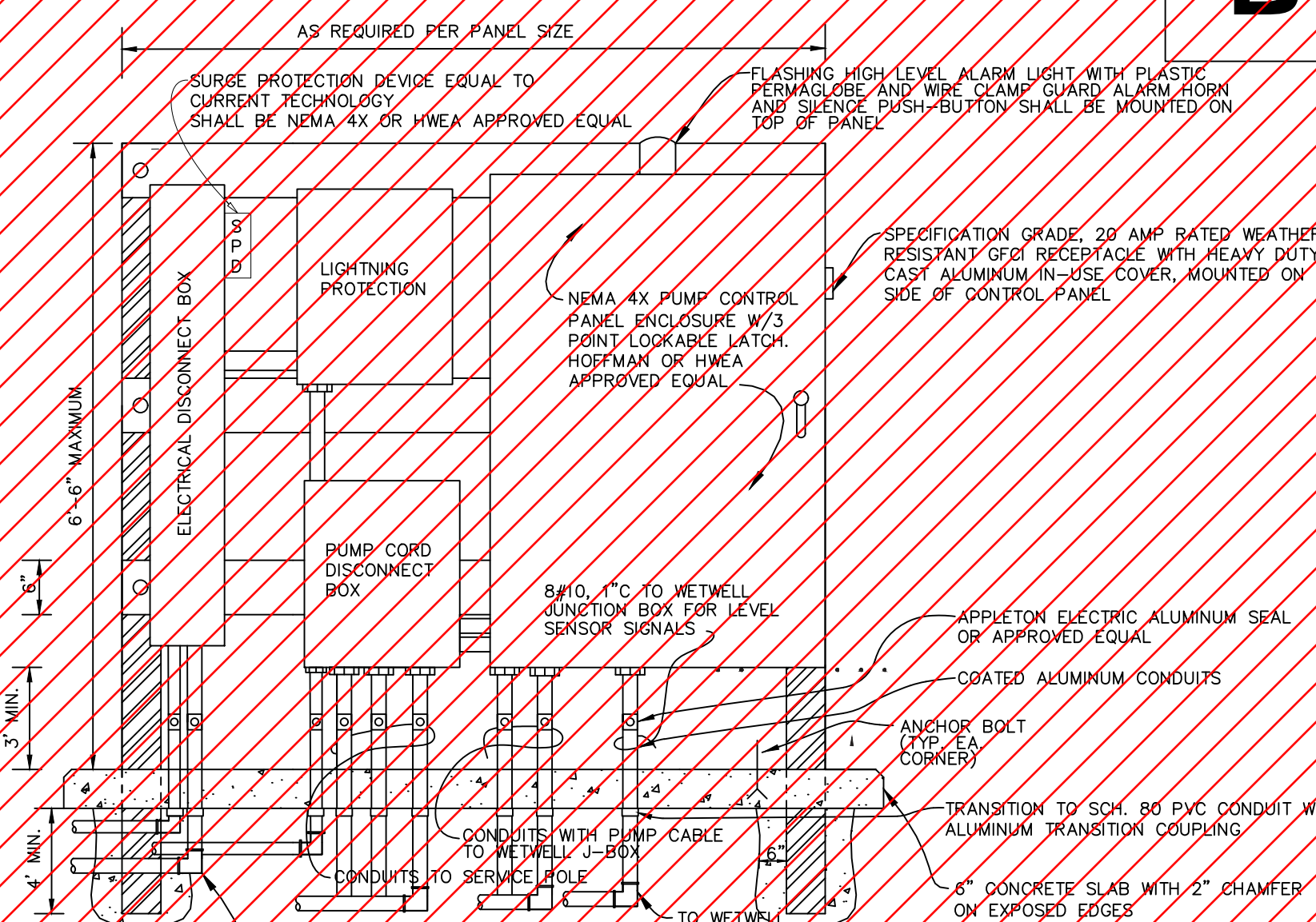
THE LOCATION OF THE ELECTRIC SERVICE POLE SHALL BE INSTALLED AT A LOCATION DETERMINED BY THE OWNER. THE POLE SHALL BE A MINIMUM DISTANCE OF 5 FEET FROM THE CONTROL PANEL STRUCTURE.

ELECTRICAL NOTES

1. ELECTRICAL CONDUIT BELOW GROUND ELEVATION SHALL BE SCHEDULE 80 PVC WITH A 1/2" MINIMUM DEPTH OF COVER.
2. ALL CONDUIT SHALL ALLOW A MINIMUM OF 1" CLEARANCE BETWEEN WIRE AND CONDUIT.
3. THE NEW ELECTRICAL SERVICE TO BE INSTALLED SHALL INCLUDE A WEATHERHEAD, METER BASE AND ALUMINUM OR STAINLESS STEEL DISCONNECT.
4. ALL ABOVE GRADE CONDUIT SHALL BE ALUMINUM AND HAVE A BITUMASTIC COATING WHEN UNDERGROUND OR WHEN IN CONTACT WITH CONCRETE.

NOTES:

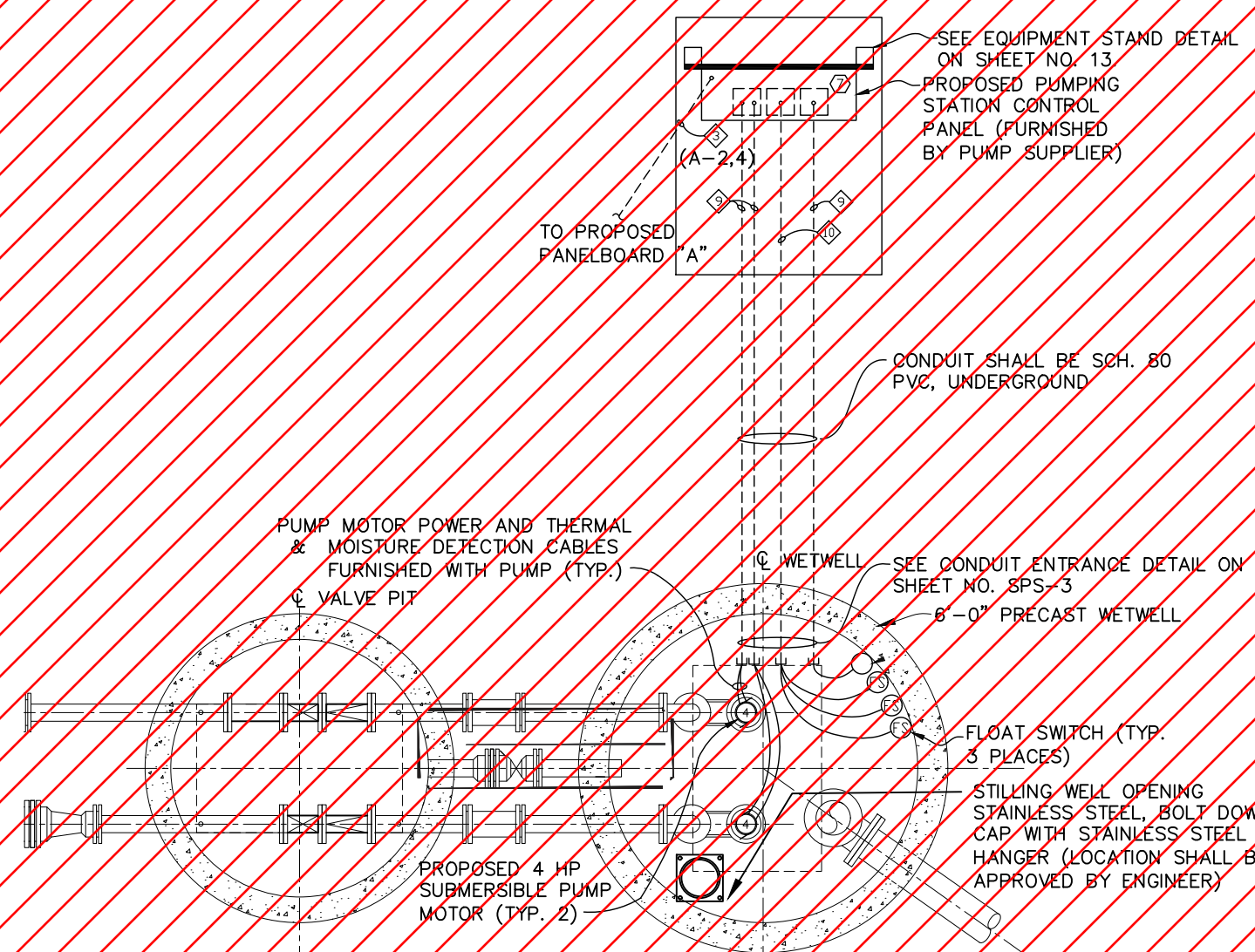
1. ALL CONDUIT ROUTING SHOWN IS DIAGRAMATIC. THE ELECTRICAL SUB-CONTRACTOR SHALL COORDINATE ALL OF THE RACEWAY INSTALLATIONS WITH OTHER TRADES TO AVOID INTERFERENCE WITH STRUCTURES AND PIPING. MAINTAIN APPROX. 24" CLEARANCE BETWEEN BURIED CONDUIT AND ALL STRUCTURES.
2. CONFIRM SERVICE ENTRANCE INSTALLATION WITH POWER CO. AND COMPLY WITH NECESSARY REQUIREMENTS.
3. ALL ELECTRICAL INSTALLATION SHALL CONFORM TO THE 2014 NATIONAL ELECTRICAL CODE, 2013 KENTUCKY BUILDING CODE, AND ALL STATE AND LOCAL CODES.
4. THE EXACT AIC RATING OF THE SERVICE ENTRANCE EQUIPMENT SHALL BE COORDINATED WITH THE POWER COMPANY'S AVAILABLE FAULT CURRENT AND ADJUSTED ACCORDINGLY.
5. ALL FASTENERS USED TO SECURE ELECTRICAL DEVICES TO FRAMES AND ANCHOR BOLTS SHALL BE 304 STAINLESS.
6. ALL EXPOSED (ABOVE GROUND) CONDUIT TO BE ALUMINUM. TRANSITION TO SCH. 80 PVC BELOW GROUND VIA EXPANSION COUPLINGS.
7. PROVIDE ARC FLASH HAZARD ANALYSIS AND WARNING LABELS PER 2014 NEC ARTICLE 110.18 AND NFPA 70E-2012 THE ANALYSIS AND LABELING SHALL INCLUDE THE AVAILABLE FAULT CURRENT AND ALL PPE REQUIREMENTS.
8. ANY CHANGES SHALL BE APPROVED BY THE ENGINEER AND/OR OWNER.



ELEVATION PROPOSED PUMP CONTROL PANEL  
N.T.S.

NOTES:

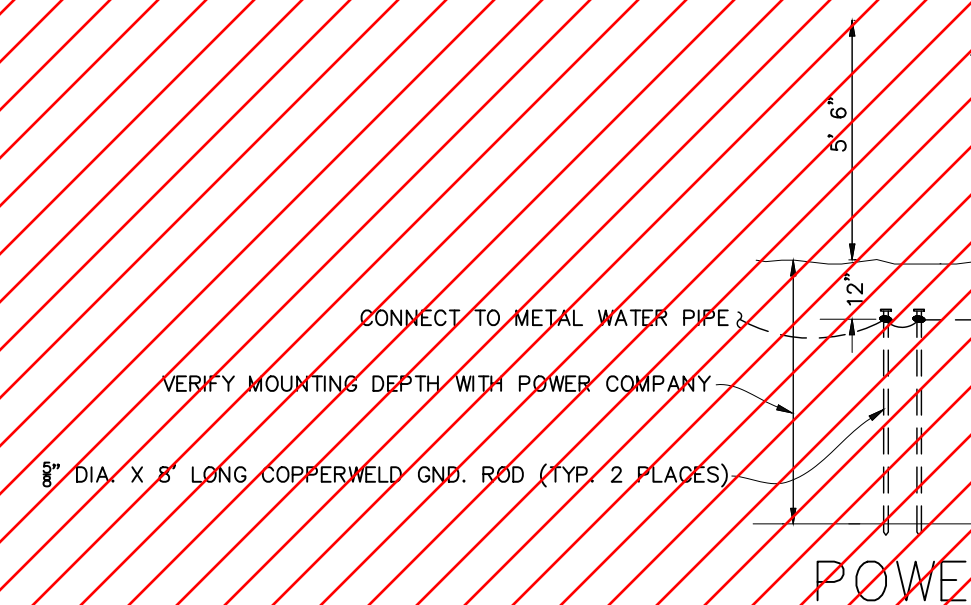
1. CONTROL PANEL SHALL BE STAINLESS STEEL SINGLE-DOOR WALL-MOUNT TYPE 4X ENCLOSURE WITH 5-POINT LATCH AS MANUFACTURED BY HOFFMAN ENCLOSURES, INC. AND CONFIGURED BY QUALITY CONTROLS INC.
2. PANEL SIZE SHALL BE DETERMINED BY QUALITY CONTROLS INC.
3. ALL ELECTRICAL COMPONENTS FURNISHED AND INSTALLED FOR THE SEWER PUMPING STATION SHALL BE IN ACCORDANCE WITH HWEA STANDARD CONSTRUCTION PRACTICE.
4. PANEL SHALL BE LOCATED 5' ABOVE ANY HIGH WATER ELEVATION.
5. CONTROL PANEL MOUNT SHALL BE BUILT USING 6" X 6" ALUMINUM POSTS, COATED BELOW TOP OF SLAB, AND STAINLESS STEEL UNI-STRUTS.
6. ALL PANELS SHALL BE STAINLESS STEEL.
7. NO PRESSURE TREATED WOOD SHALL BE USED ON THE PUMP CONTROL PANEL MOUNTING STRUCTURE.



PUMPING STATION ELECTRICAL LAYOUT  
N.T.S.

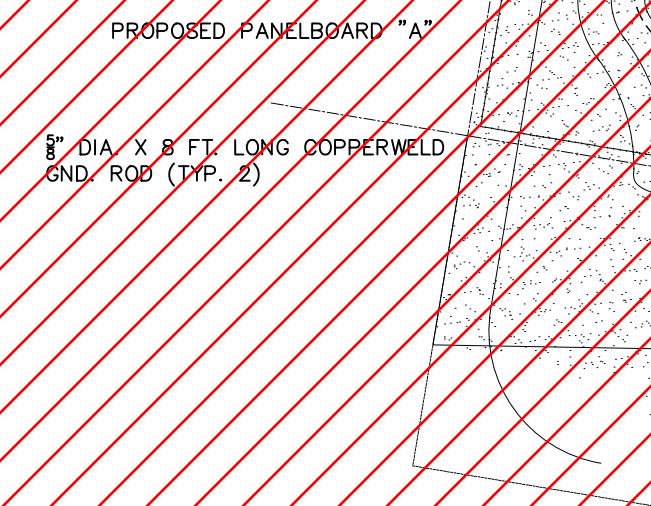
= PROVIDE AND INSTALL NEW

MOUNT BASE PLATE USING KWIK BOLT, AND S.S. HARDWARE. COAT W/ BITUMASTIC BETWEEN BASE AND CONCRETE.

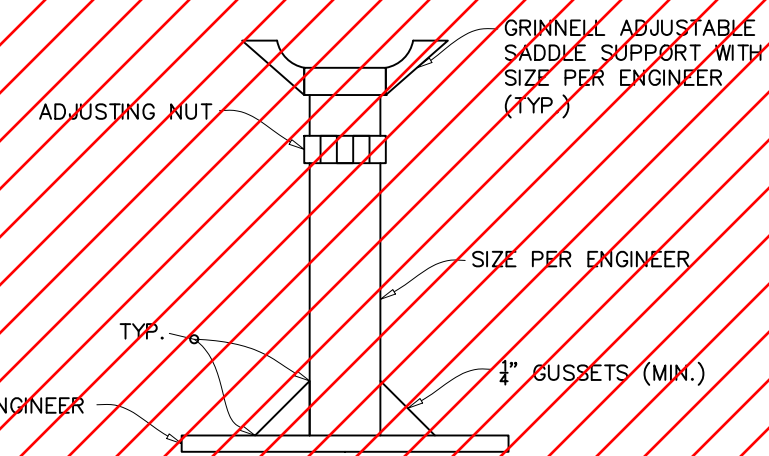


NOTES:

1. THE SITE LOCATION SHALL BE APPROVED BY THE ENGINEER AND/OR OWNER.



TYPICAL SITE PLAN



ADJUSTABLE PIPE SADDLE SUPPORT  
N.T.S.

PIPE SUPPORT MATERIAL - CARBON STEEL SADDLE, LOCKNUT NIPPLE, AND SPECIAL CAST IRON REDUCER. BASE INCLUDED AS MANUFACTURED BY PIPING TECHNOLOGY & PRODUCTS, INC. [pipingtech.com/products/pipe-supports-hangers/pipe-saddles-coverings/#pep-1](http://pipingtech.com/products/pipe-supports-hangers/pipe-saddles-coverings/#pep-1)

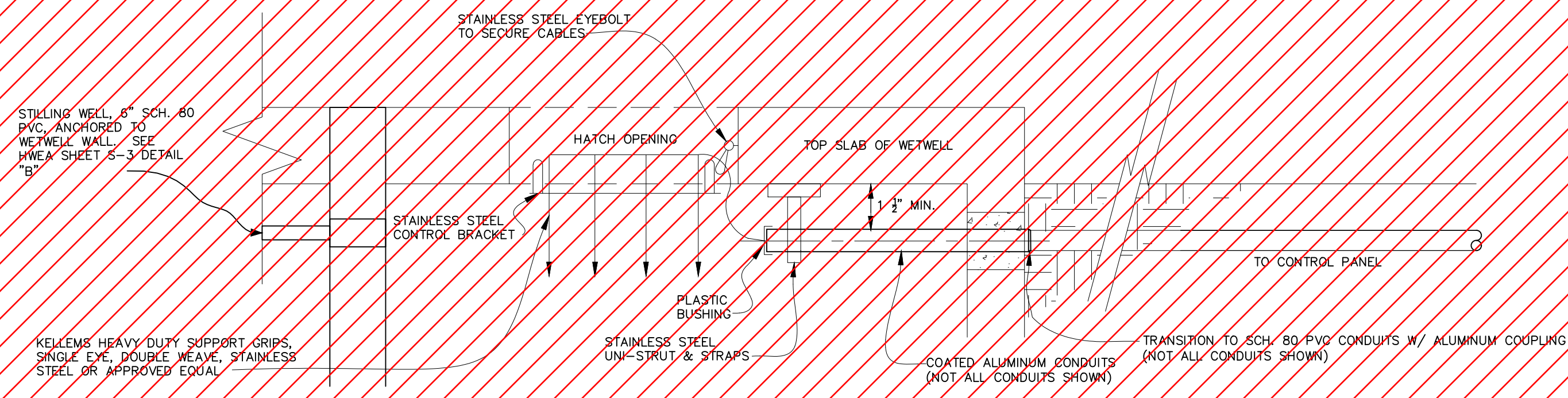
### Blooming Grove Road Sewage Pumping Station

Hopkinsville Water Environment Authority  
401 East 9th St - PO Box 628  
Hopkinsville, KY 42241-0628  
270-887-4246 [www.hwea-ky.com](http://www.hwea-ky.com)

EXHIBIT - H  
SPS Proposed Upgrades  
04/14/2021

3/18/2021 8:46:26 AM S:\Private Share\Engineering Construction & Distribution\Engineering Standards\Standard Details\2021 Edition - FINAL\SPS\SPS-3 (Update 2021 Revision)\_FINAL.dwg

**A**

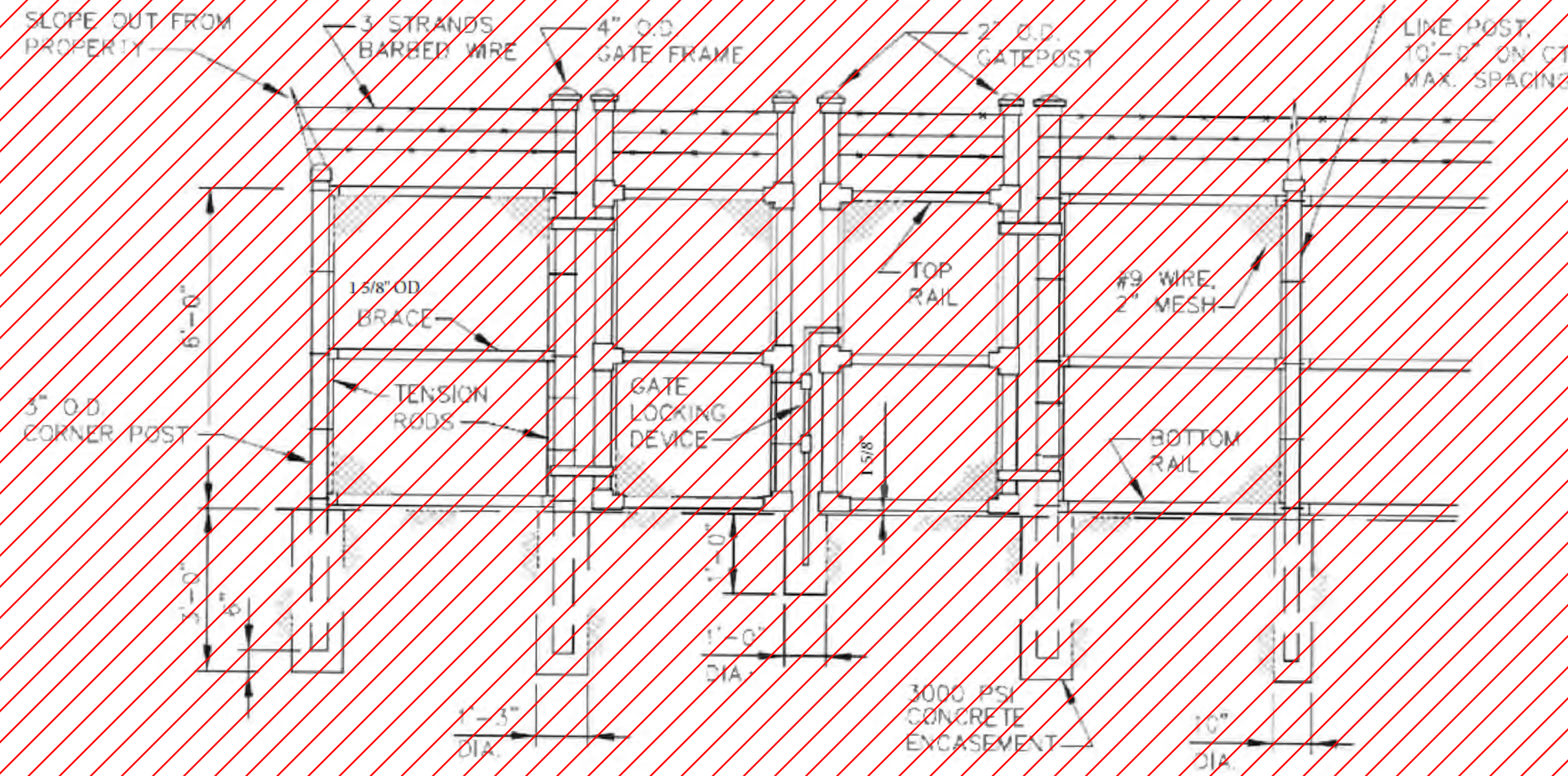


CONDUIT ENTRANCE DETAIL  
N.T.S.

NOTE:  
ELECTRICAL CONDUIT PENETRATIONS INTO THE WETWELL SHALL BE CORE-DRILLED WITH CORES SPACED A MINIMUM OF 2" APART. MINIMUM DEPTH =

- GENERAL SPECIFICATIONS:
- THE DRAWINGS ARE DIAGRAMATIC AND INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF THE PROP. EXACT LOCATION OF EQUIPMENT AND WORK. THE EXACT LOCATION OF ALL PANELS AND EQUIPMENT TO BE EXISTING AND PROPOSED WORK TO INSURE PROPER INSTALLATION BEFORE FABRICATING AND INSTALLING AN
  - ALL WIRING SHALL BE TYPE THHN/THWN (90° C.) COPPER CONDUCTORS.
  - PROVIDE COLOR CODED WIRE AND WITH A DIFFERENT COLOR FOR EACH PHASE AND NEUTRAL AND GROUND RED RESPECTIVELY; NEUTRAL: WHITE; GROUND: GREEN. APPROVED COLOR TAPE IS ACCEPTABLE FOR FEED
  - ALL CONDUIT SHALL BE ALUMINUM RIGID METAL / SCH. 80 PVC EXCEPT WHERE NOTED OTHERWISE ON T
  - WHERE RIGID CONDUIT IS USED IN CONCRETE SLABS OR UNDERGROUND APPLICATIONS, THE CONTRACTOR MANUFACTURED BY CARCON OR EQUAL, WITH GROUND WIRE AS REQUIRED BY CODE. ALL CONDUIT TURNS ALUMINUM ELBOWS.
  - FEEDER CABLES SHALL BE SPLICED ONLY AT TAP POINTS AS INDICATED ON THE DRAWINGS.
  - PANELBOARDS SHALL BE FACTORY ASSEMBLED DEAD FRONT TYPE WITH COPPER BUS, LOGS, NEMA 1, 3R CIRCUIT BREAKERS OF FRAME AND TRIP RATINGS SHOWN ON THE PLANS AS MANUFACTURED BY SQUARE D.
  - PANELBOARDS, POWER PANELS, SAFETY SWITCHES, AND OTHER ELECTRICAL EQUIPMENT SHALL BE EQUIP SCREWS.
  - PANELBOARDS SHALL BE LABELED PER THE DRAWING IDENTIFYING THE BRANCH CIRCUITS. ALL STARTER THE LOAD BEING FED.
  - THE ELECTRICAL CONTRACTOR SHALL REMOVE ALL EXISTING MATERIALS AND EQUIPMENT MADE OBSOLETE AS SHOWN ON THE PLANS AND SPECIFIED. MAINTAIN SUCH EXISTING EQUIPMENT AND MATERIALS INTACT A
  - ALL ELECTRICAL INSTALLATION SHALL BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE OFFICIAL LABELS WHERE SUCH LABELING IS CUSTOMARY.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND COORDINATION OF REQUIRED ELECTRICAL INSPECTIONS.
  - THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROCURE ALL PERMITS, CERTIFICATES AND LICENSES R COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES OR RULES AND ANY REGULATIONS BELA
  - ALL CONDUITS SHALL HAVE INSTALLED A GREEN EQUIPMENT GROUNDING CONDUCTOR WHICH SHALL BE
  - ALL CIRCUITS SHALL BE INSTALLED WITH SEPARATE FULL SIZE NEUTRALS.
  - THE CONTRACTOR SHALL WARRANTY ALL WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR A
  - THE CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BID DATE TO DETERMINE ACTUAL CONDITIONS UNDER AND TO VERIFY TOTAL SCOPE OF WORK REQUIRED. FAILURE TO DO SO SHALL NOT CONSTITUTE REASON FO
  - ANY CHANGES SHALL BE APPROVED BY ENGINEER / OWNER.

**B**



SECURITY FENCE W/ SWING GATE DETAIL  
N.T.S.

NOTES:  
1. THE GATE SHALL BE PLACED IN THE FIELD PER THE OWNER'S SPECIFIED LOCATION.

CONDUIT & WIRE DESIGNATION

DESIG.	DESCRIPTION
1	2" C., 3-#8 THHN/THWN CU.
2	2" C., 3-#8 THHN/THWN CU. & 1-#6 THHN/THWN G
3	1 1/2" C., 3-#3 THHN/THWN CU. & 1-#8 THHN/THWN
4	1 1/2" C., 2-#10 THHN/THWN CU. & 1-#10 THHN/THWN
5	1 1/2" C., 2-#8 THHN/THWN CU. & 1-#10 THHN/THWN
6	1 1/2" C., 12-#14 THHN/THWN CU. & 1-#12 THHN/THWN
7	1 1/2" C., 8-#14 THHN/THWN CU. & 1-#12 THHN/THWN
8	1 1/2" C., 2 EA. - 2/C - #16 AWG TWISTED PAIR, SHIELD
9	1 1/2" C., (EMPTY WITH PULLWIRE)
10	1 1/2" C., (EMPTY WITH PULLWIRE)

- NOTES:
- ALL CONDUIT ROUTING SHOWN IS DIAGRAMATIC. THE ELECT COORDINATE ALL OF THE RACEWAY INSTALLATIONS WITH OTHER STRUCTURES AND PIPING. MAINTAIN APPROX. 2" CLEARANCE AND ALL STRUCTURES.
  - CONFIRM SERVICE ENTRANCE INSTALLATION WITH POWER CO. REQUIREMENTS.
  - ALL ELECTRICAL INSTALLATIONS SHALL CONFORM TO THE 201 KENTUCKY BUILDING CODE AND ALL STATE AND LOCAL CODE.
  - THE EXACT AND RATING OF THE SERVICE ENTRANCE EQUIPMENT POWER COMPANY'S AVAILABLE FAULT CURRENT AND ADJUSTE
  - ALL FASTENERS USED TO SECURE ELECTRICAL DEVICES TO FR 304 STAINLESS.
  - ALL EXPOSED (ABOVE GROUND) CONDUIT TO BE ALUMINUM GROUND VIA EXPANSION COUPLINGS.
  - PROVIDE ARC FLASH HAZARD ANALYSIS AND WARNING LABEL NEPA 70E-2012. THE ANALYSIS AND LABELING SHALL INCL AND ALL PPE REQUIREMENTS.
  - THE AREA WITHIN THE FENCING AND THE DRIVE APPROACH S LEVELED O.G.A.

**C**

TYPE: 120 V., 1 PH., 3 W.  
SERVICE: 2  
POLES: EQUIPMENT STAND  
LOCATION:

PANEL "A" (SERVICE ENTRANCE RATED)  
BUS AMPACITY: 150 A  
MAINS: 150 A  
NEUTRAL: FULL  
SHORT CIRCUIT RATING: 22,000

UNLESS OTHERWISE NOTED, SIZE CONDUITS PER NEC. BASE ON TYPE THHN.  NEMA 1  NEMA 3R

CKT.	KVA	CB TRIP	CONDUIT	WIRE	LOAD NAME	LOAD NAME	WIRE	CONDUIT	CB TRIP	CKT. KVA	
ØA	ØB										
		30			SURGE PROTECTION DEVICE	1 2 PUMP STATION CONTROL PANEL	#3	1	100	5.4	
		40			SURGE PROTECTION DEVICE	3 4 PUMP STATION CONTROL PANEL	#3	1	100	5.4	
0.2		40		#10	RECEPTACLE	5 6 SPACE					
		40			SPACE	7 8 SPACE					
					SPACE	9 10 SPACE					
					SPACE	11 12 SPACE					
					SPACE	13 14 SPACE					
					SPACE	15 16 SPACE					
					SPACE	17 18 SPACE					
0.2					TOTAL CONNECTED KVA: 11.0					5.4	5.4

=PROVIDE AND INSTALL NEW

Blooming Grove Road Sewage Pumping Station



Hopkinsville Water Environment Authority  
401 East 9th St - PO Box 628  
Hopkinsville, KY 42241-0628  
270-887-4246 www.hwea-ky.com

EXHIBIT - H  
SPS Proposed Upgrades  
04/14/2021

## NP 3153 HT 3~ 466

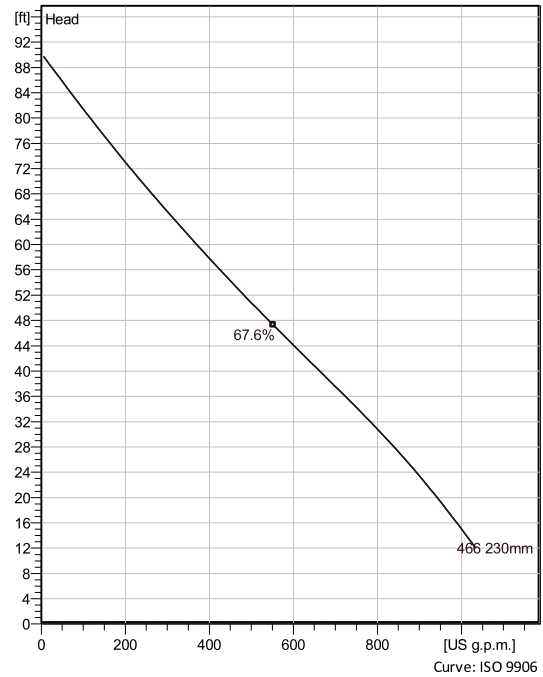
Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.



### Technical specification



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



### Configuration

<b>Motor number</b> N3153.095 21-15-4AA-W 12hp	<b>Installation type</b> P - Semi permanent, Wet
<b>Impeller diameter</b> 230 mm	<b>Discharge diameter</b> 4 inch

### Pump information

<b>Impeller diameter</b> 230 mm
<b>Discharge diameter</b> 4 inch
<b>Inlet diameter</b> 150 mm
<b>Maximum operating speed</b> 1765 rpm
<b>Number of blades</b> 2
<b>Max. fluid temperature</b> 40 °C

### Materials

<b>Impeller</b> Hard-Iron™
-------------------------------

**Project**  
**Block**

**Created by** Glenn Fischer  
**Created on** 4/23/2021 **Last update** 4/23/2021

**NP 3153 HT 3~ 466**

## Technical specification

**Motor - General**

<b>Motor number</b> N3153.095 21-15-4AA-W 12hp	<b>Phases</b> 3~	<b>Rated speed</b> 1765 rpm	<b>Rated power</b> 12 hp
<b>ATEX approved</b> FM	<b>Number of poles</b> 4	<b>Rated current</b> 32 A	<b>Stator variant</b> 5
<b>Frequency</b> 60 Hz	<b>Rated voltage</b> 230 V	<b>Insulation class</b> H	<b>Type of Duty</b> S1
<b>Version code</b> 095			

**Motor - Technical**

<b>Power factor - 1/1 Load</b> 0.78	<b>Motor efficiency - 1/1 Load</b> 88.5 %	<b>Total moment of inertia</b> 1.91 lb ft <sup>2</sup>	<b>Starts per hour max.</b> 30
<b>Power factor - 3/4 Load</b> 0.71	<b>Motor efficiency - 3/4 Load</b> 88.5 %	<b>Starting current, direct starting</b> 228 A	
<b>Power factor - 1/2 Load</b> 0.58	<b>Motor efficiency - 1/2 Load</b> 87.0 %	<b>Starting current, star-delta</b> 75.9 A	

**Project**  
**Block**

**Created by** Glenn Fischer  
**Created on** 4/23/2021 **Last update** 4/23/2021

# NP 3153 HT 3~ 466

## Performance curve

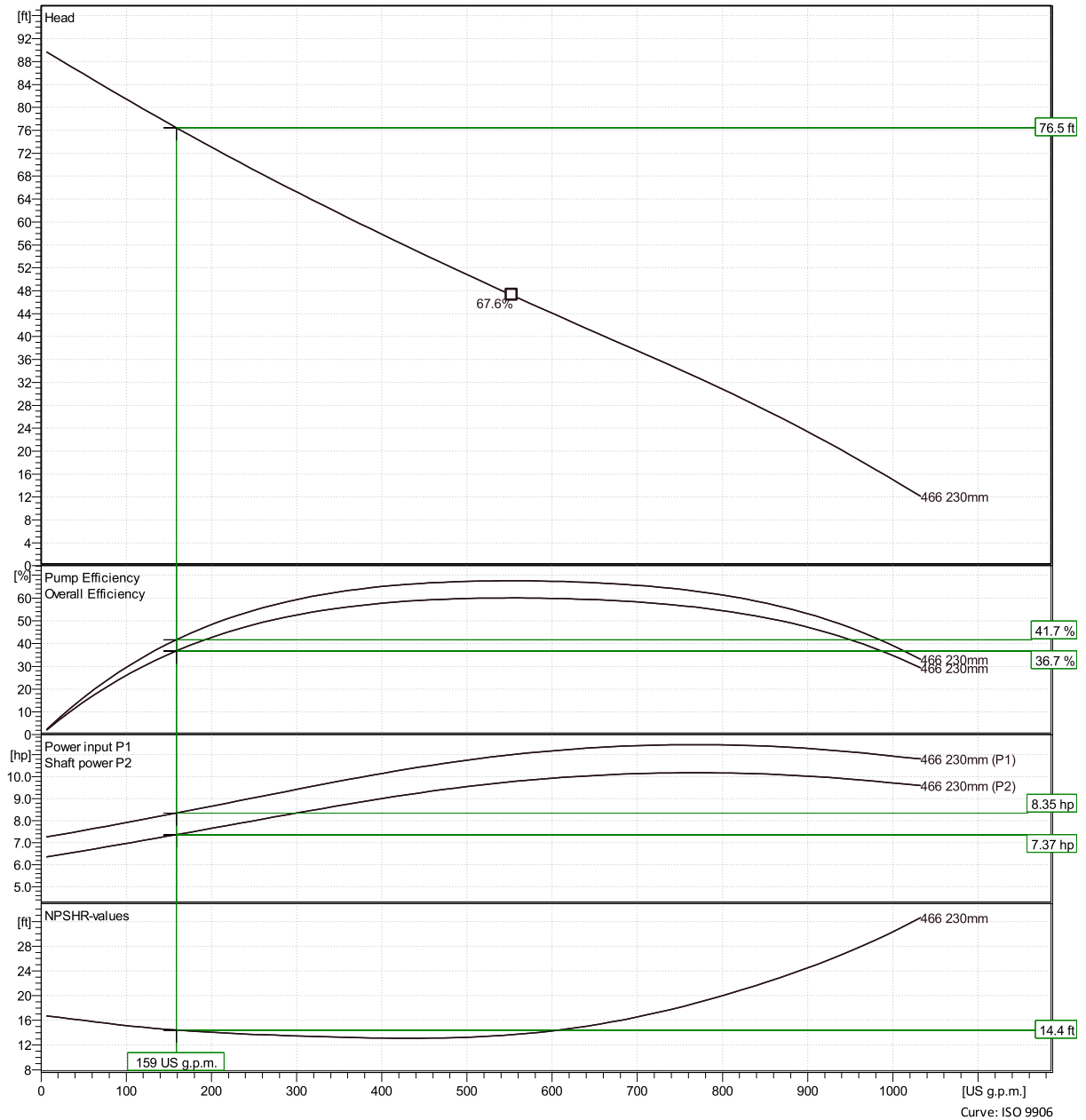


### Duty point

**Flow**  
159 US g.p.m.

**Head**  
76.5 ft

Curves according to: Water, pure 39.2 °F, 62.42 lb/ft<sup>3</sup>, 1.6891E-5 ft<sup>2</sup>/s



<b>Project</b>	<b>Created by</b>	Glenn Fischer
<b>Block</b>	<b>Created on</b>	4/23/2021
	<b>Last update</b>	4/23/2021

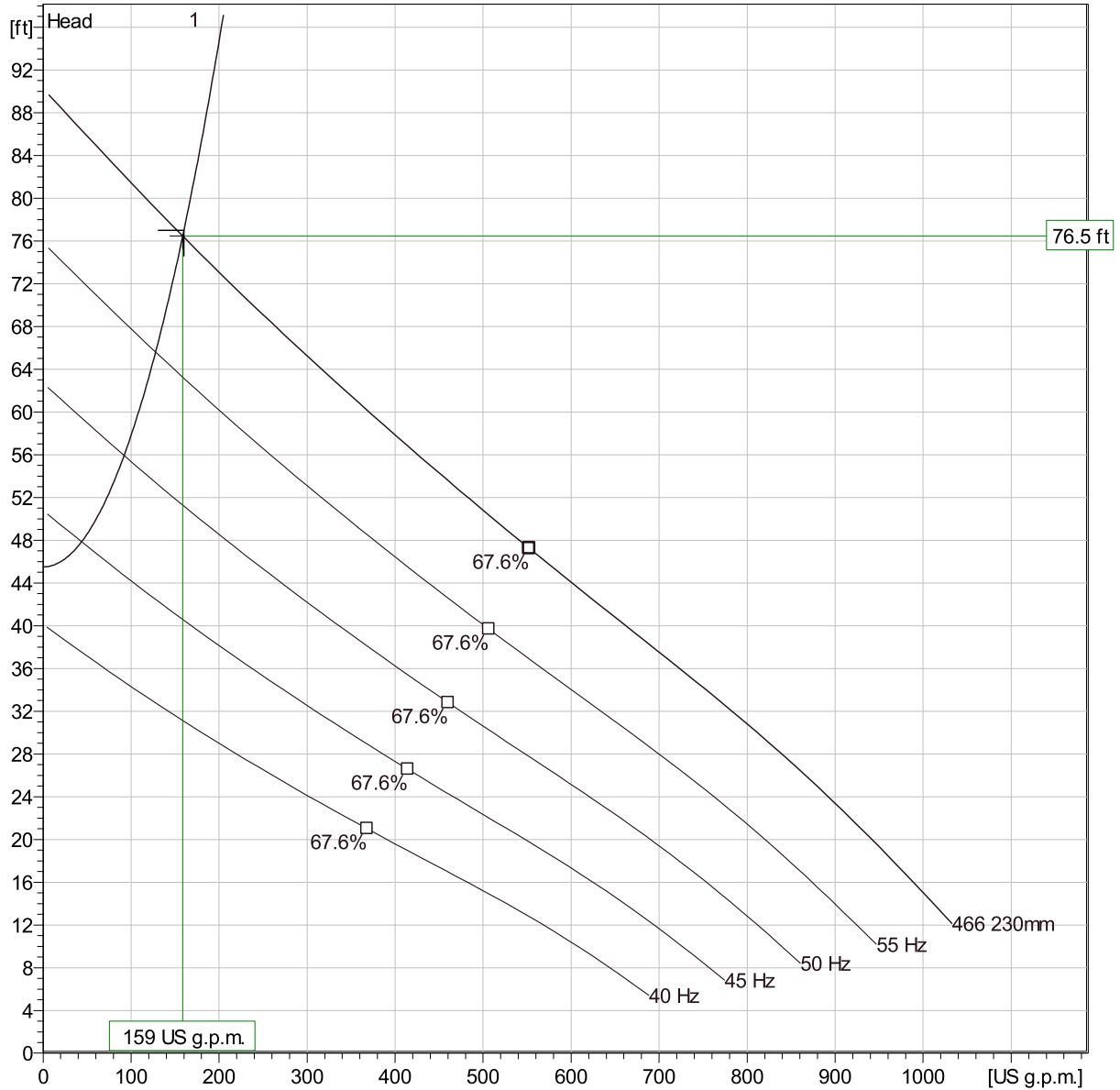
Curve: ISO 9906

# NP 3153 HT 3~ 466

## Duty Analysis



Curves according to: Water, pure, 39.2 °F, 62.42 lb/ft<sup>3</sup>, 1.6891E-5 ft<sup>2</sup>/s



### Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific Energy	NPSHr
1	159 US g.p.m.	76.5 ft	7.37 hp	159 US g.p.m.	76.5 ft	7.37 hp	41.7 %	654 kWh/US M	14.4 ft

Project	Created by	Glenn Fischer		
Block	Created on	4/23/2021	Last update	4/23/2021

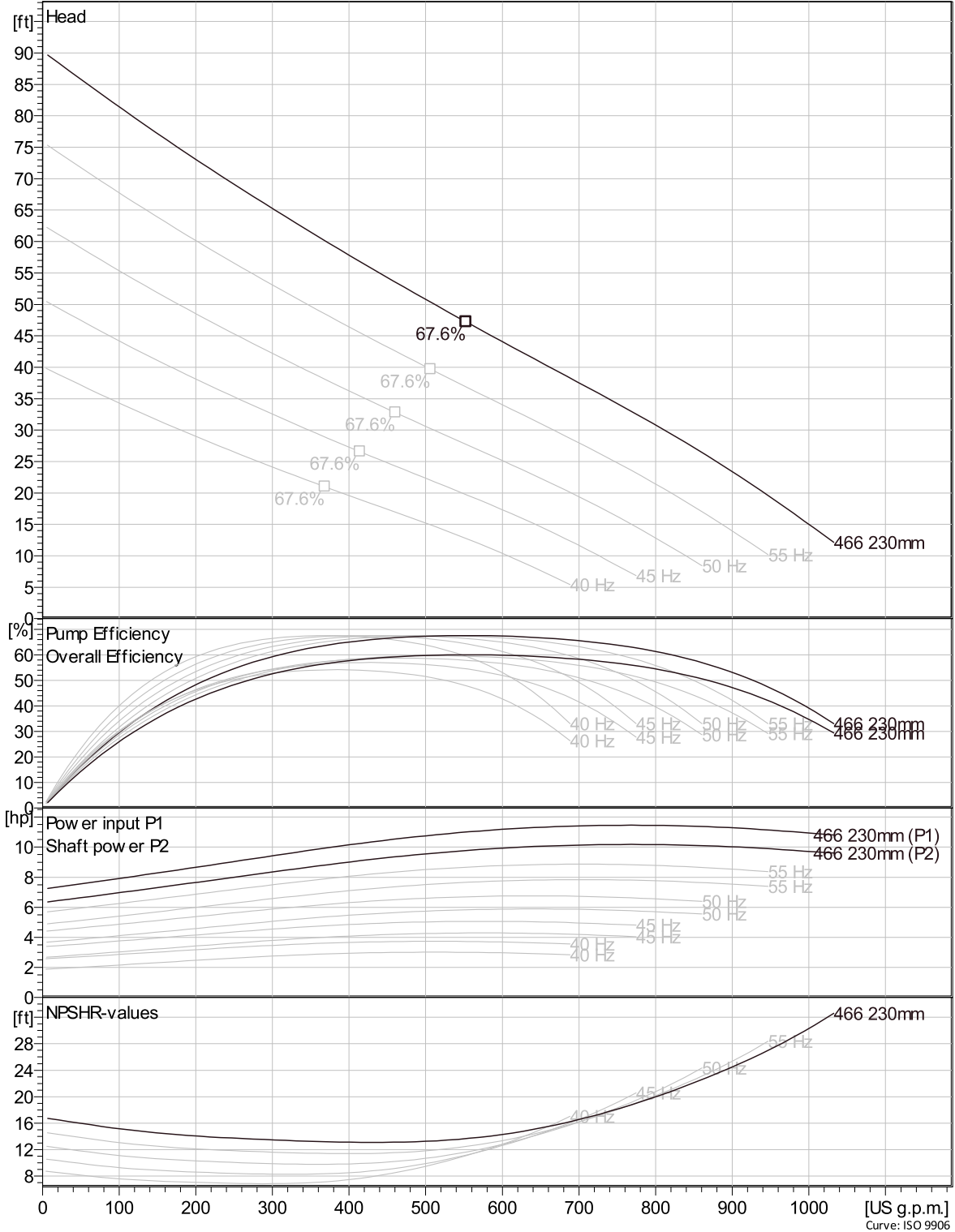


# NP 3153 HT 3~ 466

## VFD Curve



Curves according to: Water, pure, 39.2 °F, 62.42 lb/ft<sup>3</sup>, 1.6891E-5 ft<sup>2</sup>/s

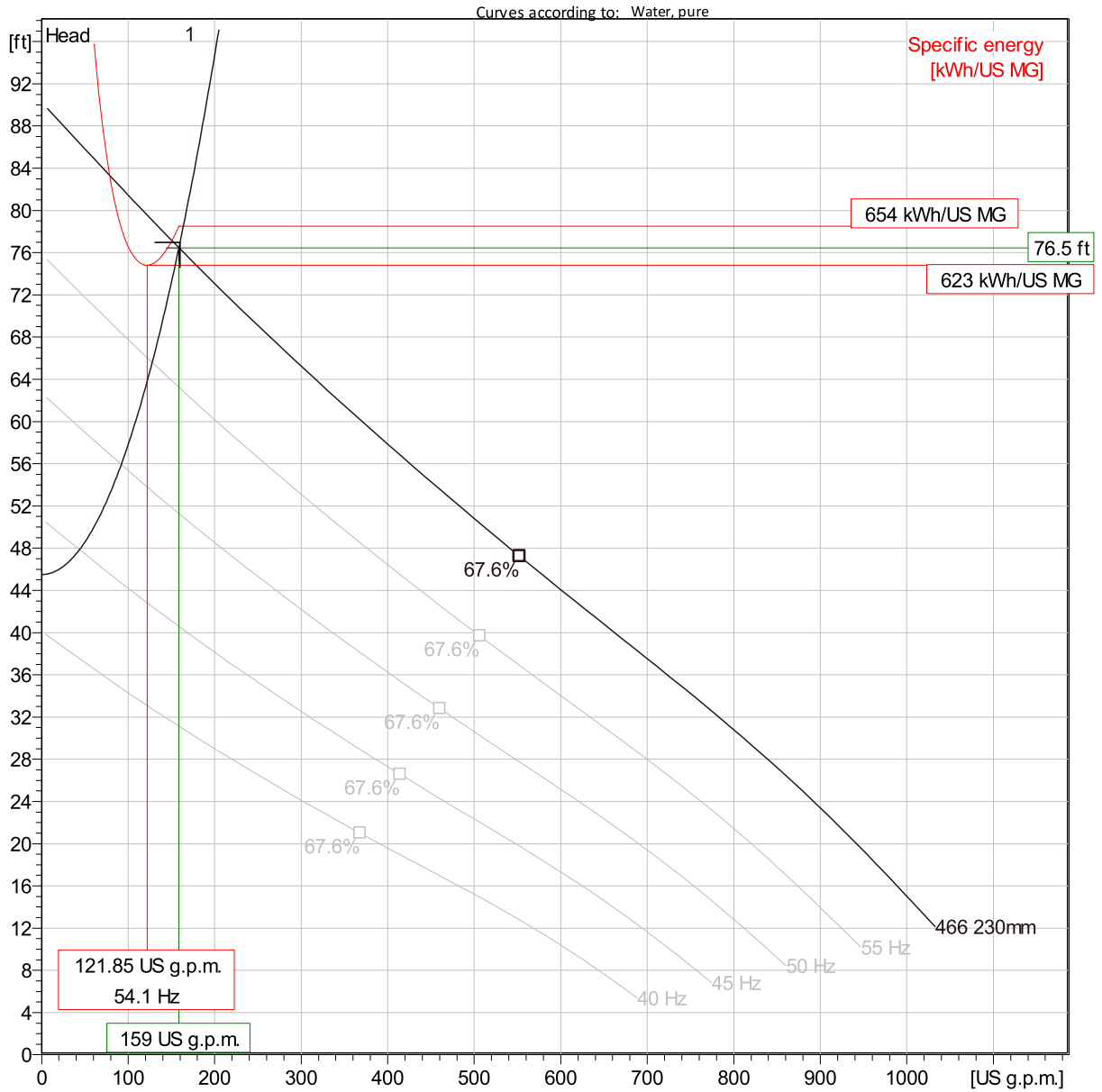


Project	Created by	Glenn Fischer	
Block	Created on	4/23/2021	Last update 4/23/2021

Curve: ISO 9906

# NP 3153 HT 3~ 466

## VFD Analysis



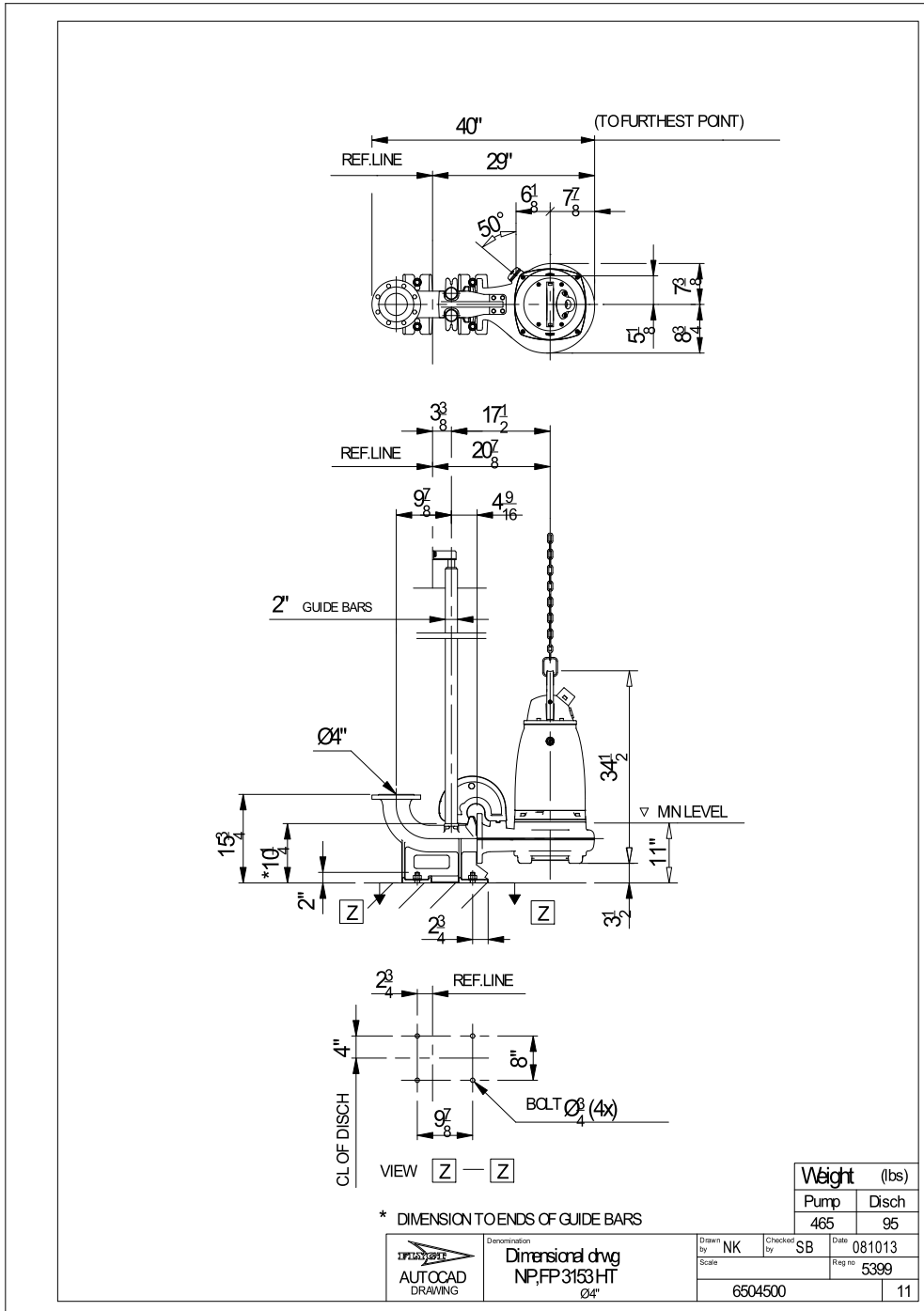
### Operating characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific Energy	NPSHre
1	60 Hz	159 US g.p.m.	76.5 ft	7.37 hp	159 US g.p.m.	76.5 ft	7.37 hp	41.7 %	654 kWh/US M	14.4 ft
1	55 Hz	128 US g.p.m.	65.6 ft	5.57 hp	128 US g.p.m.	65.6 ft	5.57 hp	38.1 %	624 kWh/US M	12.7 ft
1	50 Hz	92.1 US g.p.m.	55.9 ft	4.07 hp	92.1 US g.p.m.	55.9 ft	4.07 hp	32 %	653 kWh/US M	11.2 ft
1	45 Hz	43.8 US g.p.m.	47.9 ft	2.82 hp	43.8 US g.p.m.	47.9 ft	2.82 hp	18.8 %	1000 kWh/US M	9.99 ft
1	40 Hz									

Project	Created by	Glenn Fischer	
Block	Created on	4/23/2021	Last update 4/23/2021

**NP 3153 HT 3~ 466**

Dimensional drawing



Project  
Block

Created by Glenn Fischer  
Created on 4/23/2021 Last update 4/23/2021

Enclosure Type: NEMA 4X SS w/3Pt Latch (48"H x 36"W x 16"D)  
 Enclosure Mounting: Wall/Rack mounted by others  
 Power Requirements: 230 Volt 3 Phase  
 Horsepower: 12 HP 32 FLA  
 Station Type: Duplex Flygt Pumps

### **Equipment**

\_\_\_\_\_ Main power distribution block  
 \_\_\_\_\_ Fused Power / Phase monitoring relay with LED indication  
 \_\_\_\_\_ Three-phase Lightning Arrestor with LED indication  
 \_\_\_\_\_ Anodized Aluminum dead front inner door  
 \_\_\_\_\_ Individual pump circuit breakers, Inner door operable  
 \_\_\_\_\_ HP rated Variable Frequency Drives with electronic overload protection  
 \_\_\_\_\_ • Operator keypad with full graphic display, Inner door mounted  
 \_\_\_\_\_ Enclosure mounted filtered cooling fan and exhaust vent with 4XSS shrouds  
 \_\_\_\_\_ Pump running indicator lights, Inner door mounted  
 \_\_\_\_\_ 120 Volt fused control transformer, 2KVA  
 \_\_\_\_\_ Control and auxiliary equipment circuit breakers, Inner door mounted  
 \_\_\_\_\_ 200W Anti-Condensation heater with thermostat, Circuit breaker protected  
 \_\_\_\_\_ 15A GFI, Circuit breaker protected, Inner door mounted  
 \_\_\_\_\_ Transducer primary level control  
 \_\_\_\_\_ Programmable level controller LED display, Inner door mounted  
 \_\_\_\_\_ • 4-20ma speed signal, proportional to level, for VFD/Pump speed control  
 \_\_\_\_\_ Float Backup Level control system  
 \_\_\_\_\_ Float Backup active indicator light with reset button, Inner door mounted  
 \_\_\_\_\_ Alternator with lead/lag selector switch  
 \_\_\_\_\_ Hand-Off-Auto selector switches, Inner door mounted  
 \_\_\_\_\_ Flygt Mini-CAS relays, Inner door mounted  
 \_\_\_\_\_ • Mini-CAS LED's will be used for Seal Fail & Overtemp indication  
 \_\_\_\_\_ Elapsed time meters, Inner door mounted  
 \_\_\_\_\_ Enclosure mounted flashing alarm light for high-level & common alarms  
 \_\_\_\_\_ Enclosure mounted audible alarm horn with Silence push-button  
 \_\_\_\_\_ Terminals and ground bar for field connections  
 \_\_\_\_\_ UL 508A Listed for industrial control panels

### **Junction Box**

20x16x8 Stainless Steel J-Box – Wall mounted  
 With terminations for Pumps, Floats & Transducer