2400 5th Ave S, Ste 200, Birmingham, AL 35233
Tel 205.879.4462 | GMCNETWORK.COM

TRANSMITTAL COVER SHEET

DATE: March 11, 2025

TO: ALL PLAN HOLDERS OF RECORD

FROM: CEDRIC CAMPBELL

PROJECT: ADCNR CWSRF MONTE SANO STATE PARK LS REPLACEMENT & IMP. & SS REHAB
FOR THE ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
CWSRF Project No. CS010115-04
ADCNR-SPD Project No. 2023-069-28CW
GMC PROJECT NO. CMGM230100(7)

RE: ADDENDUM NO. 2 AND
ACKNOWLEDGEMENT OF RECEIPT OF ADDENDUM NO. 2

ACKNOWLEDGEMENT OF RECEIPT:

PLEASE PRINT RECIPIENT'S NAME, FIRM, AND DATE RECEIVED.

THEN E-MAIL BACK TO clara.posala@gmcnetwork.com FOR OUR RECORDS AND TO ACKNOWLEDGE YOUR RECEIPT OF THIS ADDENDUM.

_____
NAME *(PLEASE PRINT)*

_____
FIRM *(PLEASE PRINT)*

_____
DATE RECEIVED *(PLEASE PRINT)*

If there are any problems with this transmittal, please contact sender, at the number listed above.

ADDENDUM NUMBER 2

ADCNR CWSRF MONTE SANO STATE PARK LS REPLACEMENT & IMP. & SS REHAB
FOR THE ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
CWSRF Project No. CS010115-04
ADCNR-SPD Project No. 2023-069-28CW
GMC PROJECT NO. CMGM230100(7)

1. Revisions to Project Manual

1.1 The following revisions are hereby added as Addendum No. 2 to the referenced Project Manual and Plans and shall be considered when preparing bids.

1.2 Sealed bids for the ADCNR CWSRF Monte Sano State Park LS Replacement & Imp. & SS Rehab project CMGM230100(7) will be received by the Commissioner c/o State Parks Division of the Department of Conservation and Natural Resources, attention Dennis Grooms, at their office at Folsom Administrative Building, 64 N. Union Street, Suite 538, Montgomery, AL 36104 until **Tuesday, March 18, 2025** at 3:00 P.M. local time, Bids received will be publicly opened and read aloud **Wednesday, March 19, 2025** at 2:30 P.M.

1.3 Specification 33 3212.00 has been updated to account for a change in submersible grinder pump.

2. Revisions to Drawings

2.1 Drawing sheet C-501: Wet well bottom elevation has been revised.

2.2 Drawing sheet C-901: Elevations of wet well and floats have been revised.

2.3 Drawing sheet C-903: Dimensions and elevations of the wet well have been revised.

2.4 Drawing sheet C-904: Submersible grinder pump sheets have been alternated.

3. Clarifications

3.1 The site plan requirements for each lift station are as outlined in the bid proposal. Specification 01 1500.00 description, titled 'Lift Station Site Work (including Wet Well Slab, Wet Well Concrete Base, Grading, Gravel Surfacing, Hoist & Electric Winch) (Multiple Sites),' encompass all potential lift station site work activities. However, not all listed components apply to each lift station.

4. Contractor Questions

4.1 **Question: Please confirm that we are keeping the duplex grinder panels as 4 float operation with no submersible transducer.**
Answer: The duplex grinder will include both the four float operation and a submersible transducer.

4.2 **Question: Please confirm that we are keeping the submersible transducer on LS 1&2 with float backup.**
Answer: Confirmed.

4.3 **Question: I see the hatch for LS 1&2 are H20 rated but they are inside a chain link fence. H20 is a rating for a car to drive on and they are steel and expensive. 300 PSF is the usual rating for wetwell hatches, and they are made from aluminum which is common for pedestrian rated. Please confirm.**

Answer: H-20 rated hatches will be used on both Lift Station 1 and Lift Station 2 wet wells and valve vaults.

5. Acknowledgement of Receipt

3.1 Receipt of Addendum No. 2 shall be acknowledged in two ways:

3.1.1 Note on Page 1 of the Proposal Form – Bidder acknowledges receipt of "Addendum No. 2."

AND

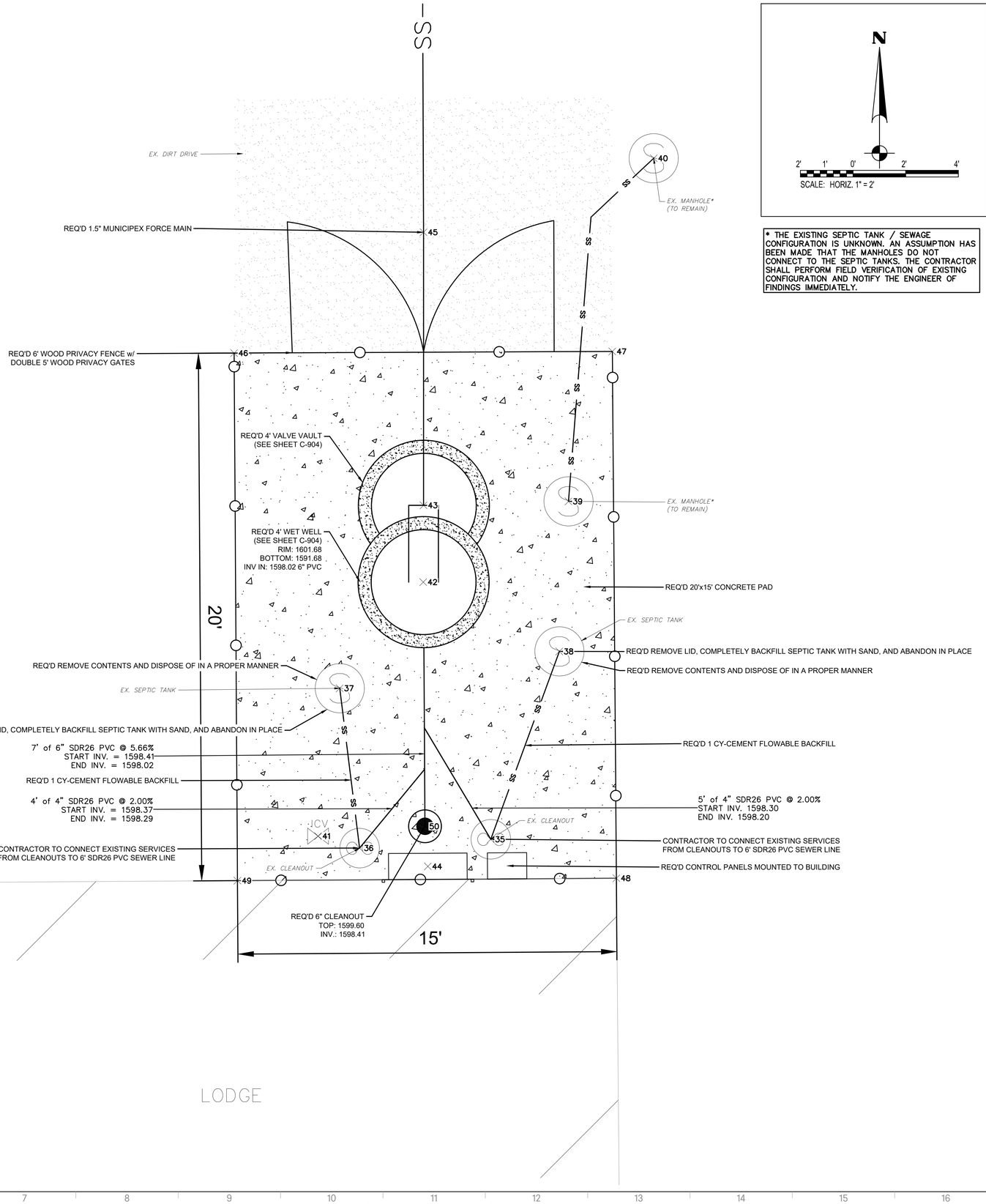
3.1.2 EMAIL Goodwyn Mills Cawood, LLC immediately at clara.posala@gmcnetwork.com and confirm that EMAIL has been received.

6. Conclusion

4.1 This is the end of Addendum No. 2, dated Tuesday, March 11, 2025.

THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE WHICH MATERIALS WILL BE KEPT AND WHICH MATERIALS SHALL BE DISPOSED.

UTILITIES INDICATED ON THE DRAWINGS ARE SHOWN AS EVIDENT OF SURFACE INVESTIGATION AND ADCNR PERSONNEL STATEMENTS, PROVIDED FOR GENERAL INFORMATION ONLY. CONTRACTOR IS TO CONTACT ALL UTILITY COMPANIES AND VERIFY LOCATION OF ANY AND ALL SUBSURFACE UTILITY LINES PRIOR TO STARTING WORK.



* THE EXISTING SEPTIC TANK / SEWAGE CONFIGURATION IS UNKNOWN. AN ASSUMPTION HAS BEEN MADE THAT THE MANHOLES DO NOT CONNECT TO THE SEPTIC TANKS. THE CONTRACTOR SHALL PERFORM FIELD VERIFICATION OF EXISTING CONFIGURATION AND NOTIFY THE ENGINEER OF FINDINGS IMMEDIATELY.

Point Table			
Point #	Northing	Easting	Description
35	1544091.9850	451476.9762	TBM – EXISTING CLEANOUT
36	1544091.6505	451471.9678	TBM – EXISTING CLEANOUT
37	1544097.7488	451471.2103	TBM – EXISTING SEPTIC TANK
38	1544099.1556	451479.5960	TBM – EXISTING SEPTIC TANK
39	1544104.8845	451479.9436	EXISTING MANHOLE
40	1544117.9804	451483.1976	EXISTING MANHOLE
41	1544092.1065	451470.3832	EXISTING ISOLATION CONTROL VALVE
42	1544101.8032	451474.4002	WET WELL
43	1544104.7333	451474.4112	VALVE VAULT
44	1544090.9518	451474.5738	WALL-MOUNTED CONTROL PANELS
45	1544115.1561	451474.4113	FORCE MAIN
46	1544110.5438	451467.1780	FENCE CORNER / CONCRETE PAD CORNER
47	1544110.6077	451481.6193	FENCE CORNER / CONCRETE PAD CORNER
48	1544090.4995	451481.7746	FENCE CORNER / CONCRETE PAD CORNER
49	1544090.4075	451467.3060	FENCE CORNER / CONCRETE PAD CORNER
50	1544092.4804	451474.4645	CLEANOUT

GMC

2660 Eastchase Lane, Suite 200
Montgomery, AL 36117
T 334.271.3200

ISSUE	DATE	
BID SET	02.10.2025	
ADDENDUM NO. 1	03.10.2025	
DESIGNER:		KMM
DRAWN BY:		KMM
CHECKED BY:		CTC

ADCNR CWSRF LIFT STATION
REPLACEMENT & IMPR. &
SS REHAB
MONTE SANO STATE PARK

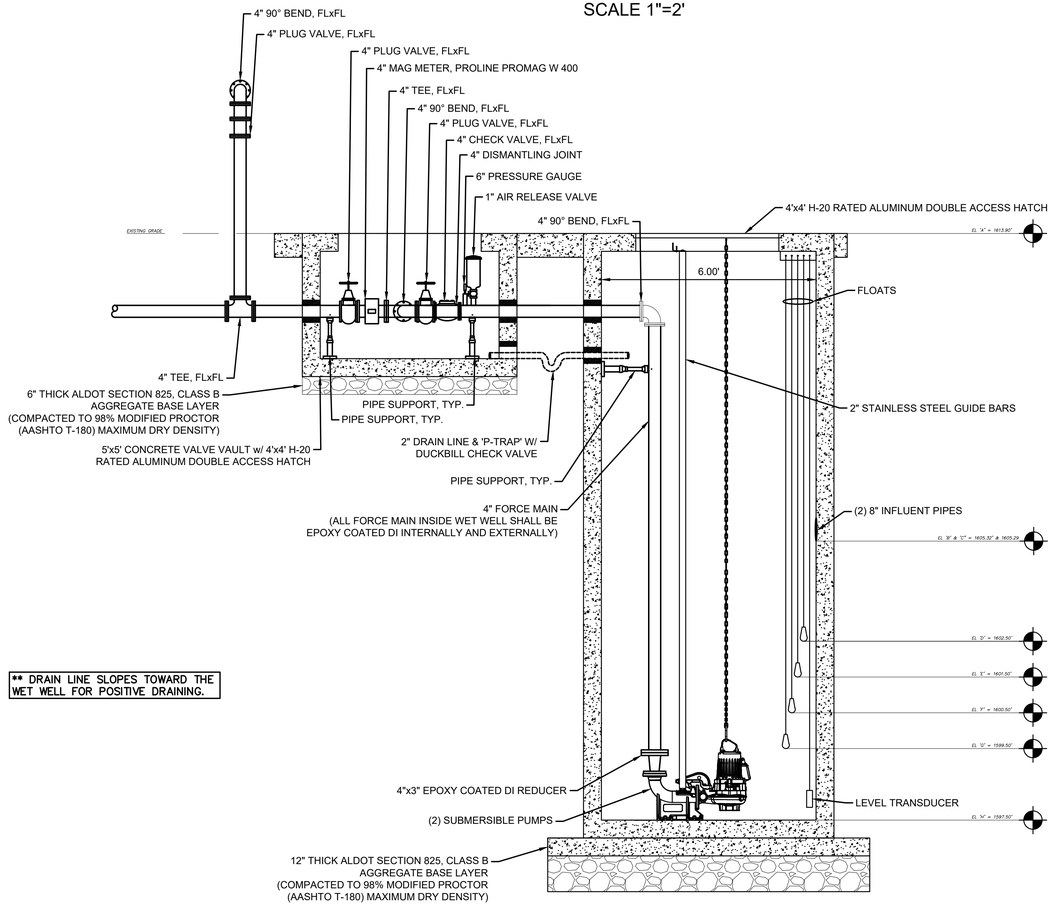
GMC # CMGM230100(7)

LODGE LIFT STATION
SITE PLAN
(ADD. ALT. NO. 2)

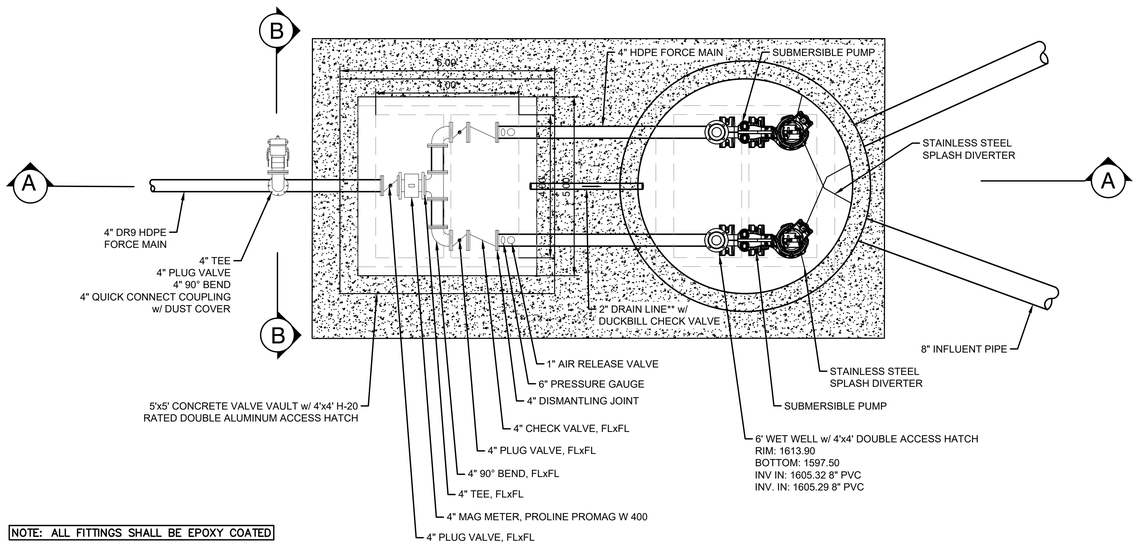
C-501

THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE WHICH MATERIALS WILL BE KEPT AND WHICH MATERIALS SHALL BE DISPOSED.

"SECTION A"
SCALE 1"=2'

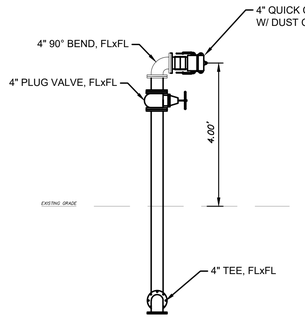


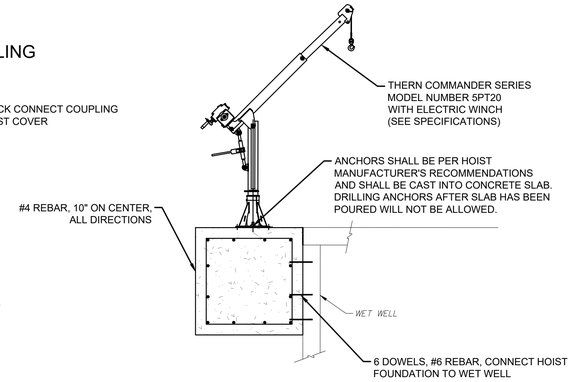
** DRAIN LINE SLOPES TOWARD THE WET WELL FOR POSITIVE DRAINING.



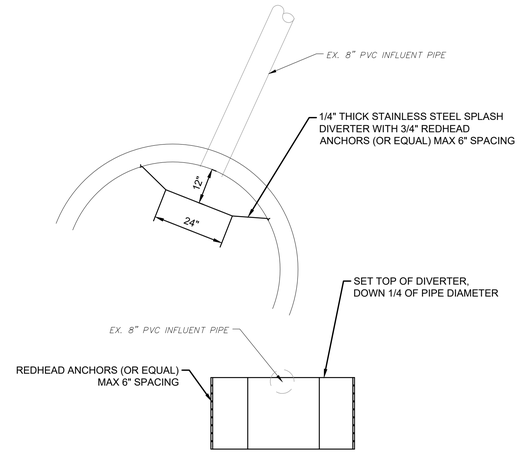
NOTE: ALL FITTINGS SHALL BE EPOXY COATED

"SECTION B"
QUICK CONNECT COUPLING
SCALE 1"=2'





HOIST DETAIL



SPLASH DIVERTER DETAIL

LIFT STATION INFORMATION

DESCRIPTION	REF.	STATION #	BASIS OF DESIGN	RPM
TOP	'A'	1613.90	BARNES 2SHVC3 IMPELLER 135 mm	1800
8" PVC INFLUENT (MANHOLE)	'B'	1605.32		
8" PVC INFLUENT (GREASE PIT)	'C'	1605.29		
HIGH WATER ALARM	'D'	1602.50		
TWO PUMPS ON	'E'	1601.50		
ONE PUMP ON	'F'	1600.50		
PUMPS OFF	'G'	1599.50		
BOTTOM	'H'	1597.50		
WET WELL DEPTH		16.40		
WET WELL DIMENSIONS		6'		
# OF PUMPS		2		
GPM		100		
TDH (FT)		23		
FREQUENCY (Hz)		60		
VOLTAGE (V)		230		
PHASE		1		
HP		5		

GMC
2660 Eastchase Lane, Suite 200
Montgomery, AL 36117
T 334.271.3200

ISSUE	DATE
BID SET	02.10.2025
ADDENDUM NO.1	03.10.2025

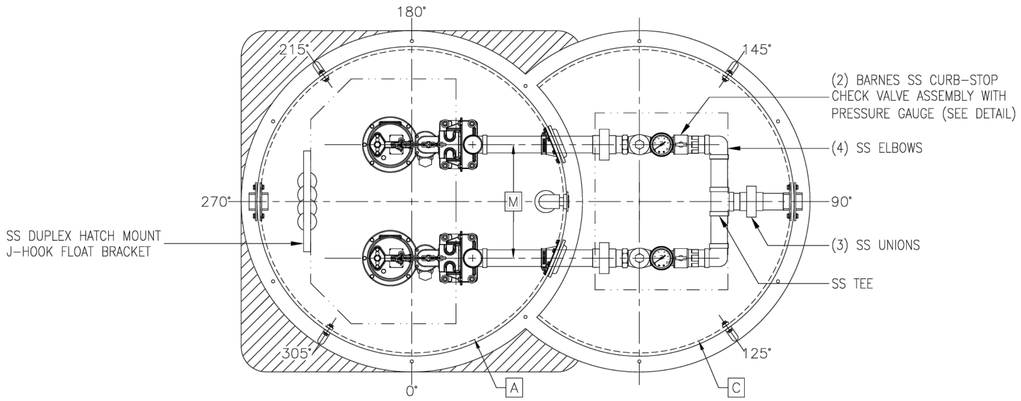
DESIGNER: KMM
DRAWN BY: KMM
CHECKED BY: CTC

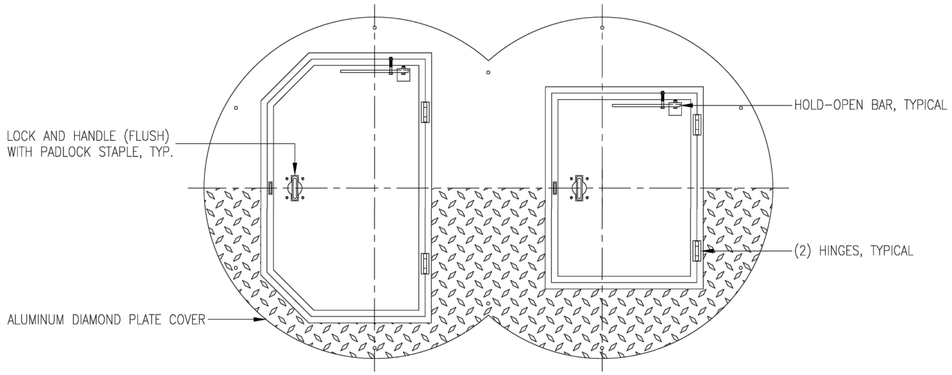
ADCNR CWSRF LIFT STATION REPLACEMENT & IMPR. & SS REHAB
MONTE SANO STATE PARK

GMC # CMGM230100(7)

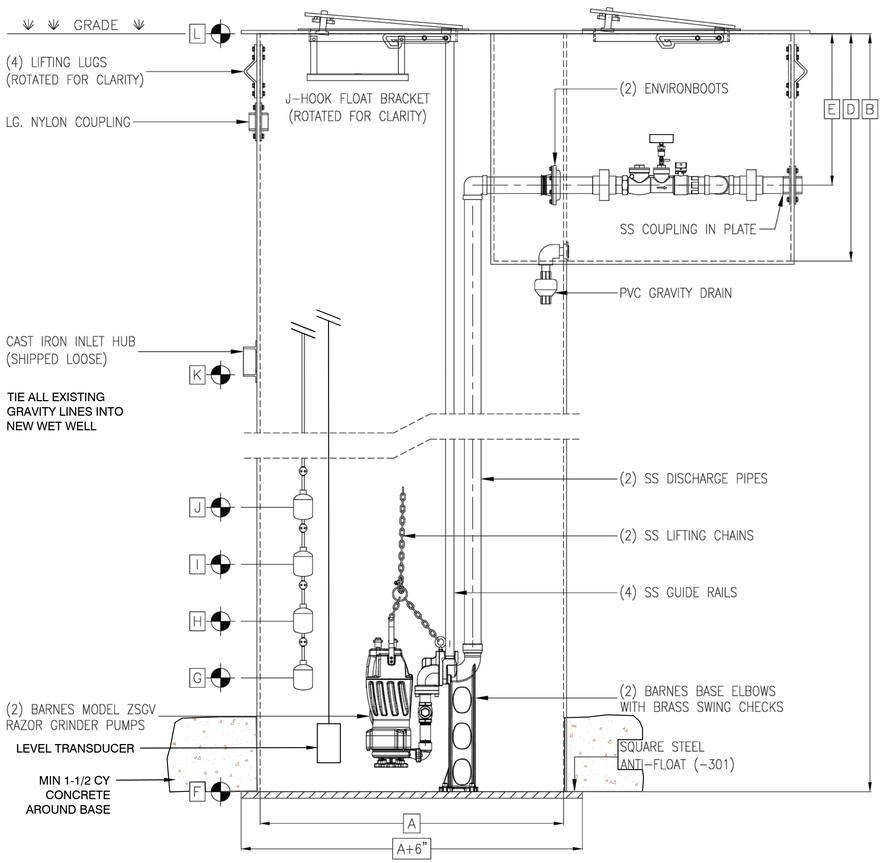
LIFT STATION 1 DETAILS

C-901



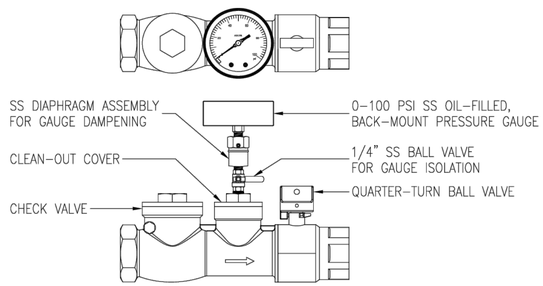


ALUMINUM COVER AND HATCH DETAIL



WET WELL ELEVATION

NOTE: ALL FITTINGS SHALL BE EPOXY COATED



BARNES SS CURB STOP ASSEMBLY DETAIL

STATION DATA TABLE

WET WELL DIAMETER	WET WELL DEPTH	VALVE BOX DIAMETER	VALVE BOX DEPTH	DISCHARGE DEPTH ℄	BOTTOM OF STATION	PUMPS OFF FLOAT	START LEAD FLOAT	START LAG FLOAT	HIGH LEVEL FLOAT	INLET INVERT	TOP OF STATION	PUMP TO PUMP ℄
A	B	C	D	E	F	G	H	I	J	K	L	M
48"	6.14'	48"	36"	24"	1591.68'	1594.50'	1595.50'	1596.50'	1597.00'	1598.02'	1601.68'	18"

PUMP MFR.	PUMP MODEL	HP	VOLTAGE	PHASE	FLA	BASE ELBOW	GUIDE RAIL DIAMETER	DISCHARGE PIPE DIA.	INLET HUB DIAMETER	WET WELL HATCH	VALVE PIT HATCH	
BARNES	ZSGV	2	208 - 240	1	17.5 - 15.0	BAF-1212	1"	1.25"	6"	25" x 40.75"	23" x 29"	

NOTES:

1. THE PUMPS MUST HAVE A 5-YEAR 100% REPAIR PARTS AND LABOR WARRANTY AS PROVIDED BY THE PUMP MANUFACTURER.
2. PRESSURE GAUGE TO BE SIZED TO READ NO MORE THAN 1-1/2 TIMES THE MAX. PRESSURE PUMP PROVIDES AT DEAD HEAD.

PUMP & PROCESS Equipment Incorporated

Scott Emfinger
Pump and Process Equipment, Inc.
300 Shadow Wood Park
Birmingham, AL 35244
Office (205) 987-3337 Cell (205) 907-4027
scott@pumpandprocess.net

TITLE: DUPLEX BARNES RAZOR ZSGV GRINDER PACKAGE

CREATED BY:	DS	APPROVED BY:	SE
SCALE:	NTS	REVISION:	0
DATE:	1/18/24	SHEET: 1 OF:	1

GMC
2660 Eastchase Lane, Suite 200
Montgomery, AL 36117
T 334.271.3200

1" 0" 1"

ISSUE	DATE	
BID SET	02.10.2025	KMM
ADDENDUM NO.1	03.10.2025	KMM
		CTC

DESIGNER:
DRAWN BY:
CHECKED BY:

ADCNR CWSRF LIFT STATION REPLACEMENT & IMPR. & SS REHAB
MONTE SANO STATE PARK

GMC # CMGM230100(7)

LODGE LIFT STATION DETAILS

C-903

DRAWING FILE: P:\1 Projects\ALL\Alabama Dept. of Conservation\CMGM230100(7) ADCNR CWSRF Monte Sano State Park LS Replacement & Imp. & SS Rehab\0 DWG\1 PLANS\5 - DETAILS_recover.dwg
PLOTTED: Mar 10, 2025 - 8:22pm

Pump Data Sheet - Crane Barnes.60

Company: Monte Sano PS#1
Name: Kaitlyn McCurdy/GMC
Date: 07/10/2024

Scott Emfinger
Pump and Process Equipment

BARNES®

Pump:

		Dimensions:	
Size:	3SHVC / 3XSHVC	Suction:	3 in
Type:	SH 3" SolidsHandling	Discharge:	3 in
Synch Speed:	1800 rpm		
Dia:	135 mm		
Curve:	---		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Search Criteria:

Flow:	100 US gpm	Near Miss:	---
Head:	23 ft	Static Head:	0 ft

Pump Limits:

Temperature:	104 °F	Sphere Size:	---
Wkg Pressure:	---		

Motor:

Standard:	NEMA	Size:	5 hp
Enclosure:	TEFC	Speed:	1800 rpm
Frame:	184T		
Sizing Criteria:	Max Power on Design Curve		

Pump Selection Warnings:
None

--- Duty Point ---

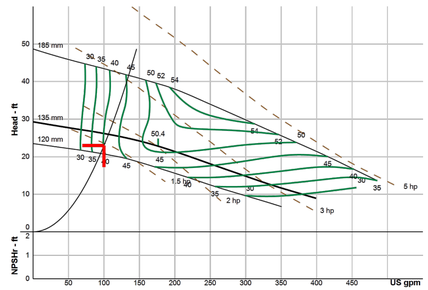
Flow:	106 US gpm
Head:	26 ft
Eff:	41.5%
Power:	1.67 hp
NPSHr:	---
Speed:	1750 rpm

--- Design Curve ---

Shutoff Head:	29.3 ft
Shutoff dP:	12.7 psi
Min Flow:	--- US gpm
BEP:	50.4% @ 176 US gpm
NOL Power:	3.38 hp @ 399 US gpm

--- Max Curve ---

Max Power:
4.78 hp @ 486 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
120	1750	25.5	45	1.73	---
100	1750	26.2	40	1.65	---
80	1750	26.8	34	1.59	---
60	1750	27.4	28	1.52	---
40	1750	---	---	---	---

BARNES®
www.cranepumps.com

Series ZSGV
Recessed Vortex

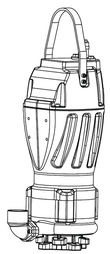
I&O Manual

Submersible Grinder Pumps

Specifications:

DISCHARGE ..... 1½" NPT, Vertical, Bolt-on Flange
LIQUID TEMPERATURE ..... 104°F (40°C) Continuous
VOLUTE ..... Cast Iron ASTM A-48, Class 30.
MOTOR HOUSING ..... Cast Iron ASTM A-48, Class 30.
SEAL PLATE ..... Cast Iron ASTM A-48, Class 30.
IMPELLER: *Design* ..... 12 Vane,Vortex, With Pump Out Vanes On Back Side. Dynamically Balanced, ISO G6.3.
Material ..... Cast Iron
CUTTLER PLATE ..... Hardened 440C Stainless Steel Rockwell® C-55.
CUTTER ..... Hardened 440CStainless Steel, Rockwell® C-55.
SHAFT ..... 416 Stainless Steel
O-RING ..... Buna-N
HARDWARE ..... 300 Series Stainless Steel
PAINT ..... Powder Coat
SEAL: *Design* ..... Tandem Mechanical, Oil Filled Reservoir.
Material ..... Rotating Faces - Silicon-Carbide
Stationary Faces - Silicon-Carbide
Elastomer - Buna-N
Hardware -300 Series Stainless
CORD ENTRY ..... 30 ft. (9.1 m) Std. Cord. Custom Molded Quick Connect, for Sealing and Strain Relief
CORD ..... CSA/UL Approved 12/4 Type SOW.
UPPER BEARING:
Design ..... Single Row, Ball, Oil Lubricated
Load ..... Radial
LOWER BEARING:
Design ..... Single Row, Ball, Oil Lubricated
Load ..... Radial & Thrust
MOTOR: *Design* ..... NEMA L-Single Phase, (ZSGV2072L, includes overload protection in the motor). NEMA B-Three Phase Torque Curve. Oil-Filled, Squirrel Cage Induction
Insulation ..... Class F
SINGLE PHASE ..... Capacitor Start/Capacitor Run. Includes overload protection in the motor. Requires Barnes® Starter or Control Panel which Includes Capacitors, or Capacitor pack.
THREE PHASE ..... Dual Voltage 240/480; Requires Overload Protection to be Included in control panel.
OPTIONAL EQUIPMENT ..... Impeller Trims, Cord Length. Moisture Sensors, Moveable Fitting, Leg Kit

RECOMMENDED:
Accessories ..... Break Away Fitting (BAF)
Check Valve
Control Panel



Series: ZSGV
2HP, 3450RPM, 60Hz

RAZOR

Sample Specifications

DESCRIPTION:

THE GRINDER PUMP IS DESIGNED TO REDUCE DOMESTIC, COMMERCIAL, INSTITUTIONAL AND LIGHT INDUSTRIAL SEWAGE TO A FINELY GROUND SLURRY.

WARNING:
CANCER AND REPRODUCTIVE HARM - WWW.P65WARNINGS.CA.GOV

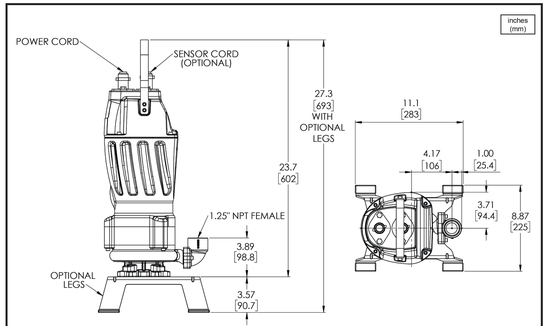
c US PENDING

SWPA MEMBER

BARNES®
www.cranepumps.com

Series ZSGV
Recessed Vortex

Submersible Grinder Pumps



MODEL NO	PART NO	HP	VOLT	PH/Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	LOCKED ROTOR AMPS	CORD SIZE	CORD TYPE	CORD O.D. ± .02 (.5) in (mm)
ZSGV2072L	145349	2	208-240	1/60	3450	H	17.5-15.0	53.8	12/4	SOW	.67(17.0)
ZSGV2092L	145353	2	208-240	3/60	3450	J	8.5-8.2	43.9	12/4	SOW	.67(17.0)
ZSGV2042L	145480	2	480	3/60	3450	J	4.6	22.0	12/4	SOW	.67(17.0)
ZSGV2052L	145481	2	600	3/60	3450	J	3.6	14.5	12/4	SOW	.67(17.0)

Optional - Temperature sensor cord for all models is 14/3 SOW, 0.55 (14mm) ± .02 (.51mm) O.D.
(Not used on ZSGV2072L).
Optional - Moisture and Temperature sensor cord for all models is 18/5 SOW, 0.49 (12.4mm) ± .02 (.51mm) O.D., replaces Temperature sensor cord.

IMPORTANT !
1.) PUMP MAY BE OPERATED "DRY" FOR EXTENDED PERIODS WITHOUT DAMAGE TO MOTOR AND/OR SEALS.
2.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.

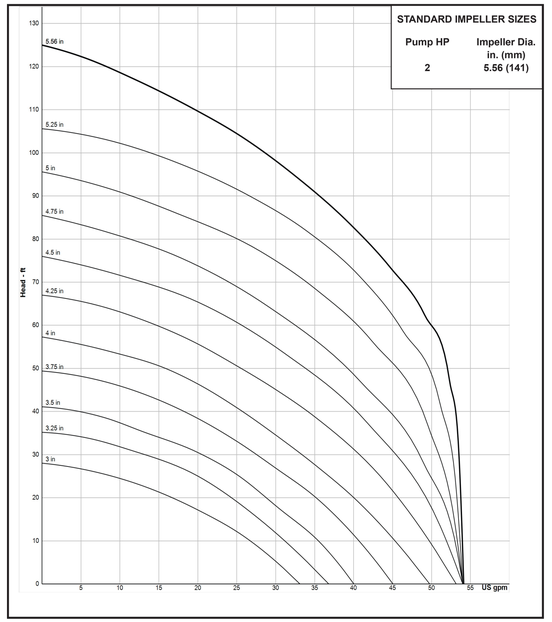
BARNES®
www.cranepumps.com

Series ZSGV
Performance Curve
2HP, 3450RPM, 60Hz

Submersible Grinder Pumps

STANDARD IMPELLER SIZES

Pump HP	Impeller Dia. in. (mm)
2	5.56 (141)



GMC

2660 Eastchase Lane, Suite 200
Montgomery, AL 36117
T 334.271.3200

1" 1" 0" 5"

ISSUE	DATE	
BID SET	02.10.2025	
ADDENDUM NO.1	03.10.2025	
DESIGNER:		KMM
DRAWN BY:		KMM
CHECKED BY:		CTC

PUMP DETAILS

ADCNR CWSRF LIFT STATION
REPLACEMENT & IMPR. &
SS REHAB
MONTE SANO STATE PARK

GMC # CMGM230100(7)

C-904

DRAWING FILE: P:\1 Projects\ALL\Alabama Dept. of Conservation\CMGM230100(7) ADCNR CWSRF Monte Sano State Park LS Replacement & Imp. & SS Rehab\0 DWG\1 PLANS\1 - DETAILS_recover.dwg
PLOTTED: Mar 10, 2025 - 5:46pm

SECTION 33 3212 – FIBERGLASS PACKAGED WASTEWATER PUMPING STATIONS

PART 1 – GENERAL (Not Used)

PART 2 – PRODUCTS

2.1 PRODUCT DETAILS

A. Service Conditions:

1. The pumps shall be submersible end suction centrifugal grinder type, installed in wet pit submersible installation. The pump will be suitable for submergence up to a depth of 66 ft.
    a. The pumps shall be provided with a permanently installed “c”-channel guide rail system, with a sliding movable fitting that automatically connects to the discharge piping when lowered into place. The moveable fitting shall be equipped with a check valve, including integrated anti-siphon.
    b. The pumps shall be installed on a pump support stand that is fabricated of 300 series stainless steel with rubberized pads on the feet, fixing the pump at the required distance to provide adequate suction clearance. The pumps shall be equipped with a 1.25-inch NPT or BSP discharge fitting which includes a check valve and integrated anti-siphon.
2. A centrifugal submersible grinder pump designed to reduce all material found in normal domestic and light industrial sewage, including plastics, rubber, sanitary napkins, and disposable diapers into a finely ground slurry. The resultant slurry is then pumped through small diameter piping into a gravity interceptor or treatment facility. The temperature limitation of the liquid being pumped is 104°F/40°C continuous, 160°F/40°C intermittent and the submersible motor shall be capable of running dry for extended periods.
3. Each pump will be capable of the following performance:

Primary Flow	12	US GPM
Primary Head	33	TDH - Feet
Minimum Hydraulic Efficiency		%
Secondary Flow		US GPM
Secondary Head		TDH - Feet
Tertiary Flow		US GPM
Tertiary Head at Shutoff		TDH - Feet
Discharge Size	1.25	In
Motor Speed	3450	RPM
Motor HP	2	HP
Frequency	60	Hz
Voltage and Phase	1 ph - 208-240	V and ph
Motor Service Factor	1.0	SF

2.2 PUMP AND MOTOR MATERIALS:

A. Component Materials

Volute	ASTM A48 Class 30 Cast Iron
Impeller	ASTM A48 Class 30 Cast Iron
Axial Cutter	ASTM A276 440C Stainless Steel, Heat Treated to a minimum Rockwell C55
Cutter plate	ASTM A276 440C Stainless Steel, Heat Treated to a minimum Rockwell C55
Motor Housing	ASTM A48 Class 30 Cast Iron
Seal Plates	ASTM A48 Class 30 Cast Iron
External Hardware	300 Stainless Steel
Lifting Bail	304 Stainless Steel
Shaft	416 Stainless Steel
Mechanical Seal	Silicon carbide for the rotating face and silicon carbide for the stationary face
Coating	The pump (s) shall be powder coated with an epoxy primer and polyester top coat
Gaskets	Buna-N
O-Rings	Buna-N
Motor Rotor Bars	Die Cast Aluminum
Elastomeric plug holding plate	ASTM A48 Class 30 Cast Iron
Cable Entry Housing	ASTM A48 Class 30 Cast Iron
Nameplate	304 Stainless Steel

B. Pump Components

1. The pump end components including the volute and impeller will be ATSM A48 Class 30 Cast Iron. The volute shall be a single piece non-concentric design, with smooth passages. The discharge connection shall be standard 1.25 inch NPT in the vertical position using a threaded bolt on discharge flange. A moveable fitting with C-Channel connection is also acceptable.
2. The pump impeller shall be of the recessed vortex design. Pumps with standard centrifugal semi-open impeller designs shall not be acceptable. The impeller shall be keyed to the shaft.
3. The impeller shall be capable of being trimmed to meet specific performance characteristics.
4. The grinder mechanism shall be specifically designed for use in a grinder pump. The mechanism shall consist of an axial cutter that is locked for rotation by a shaft key. The cutter is fixed axially by a socket head cap screw. The cutter plate is held in place by a press fit. The entire cutting mechanism shall be recessed, protecting the mechanism. All grinding mechanism components, including both the cutter plate and radial cutter shall be constructed of 440C stainless steel hardened to a minimum Rockwell C55 and shall be finish ground for a fine cutting edge. The grinder shall be placed immediately below the

pumping elements and shall be direct-driven by a single, one-piece, stainless steel motor shaft. The grinding assembly shall operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to eliminate clogging and jamming under all normal operating conditions including starting. In order to demonstrate adequate flow velocity and grinding capability, the grinder pump shall be capable of passing a series of stringy type solids (diapers, rags, feminine products, etc.) through the pump without roping or winding the material in or immediately below the pump suction.

5. The pump and motor shaft will be a solid, continuous piece of 416 stainless steel. Shafts utilizing coupling or other attachment method will not be acceptable. The shaft will have a maximum allowable deflection of 0.002 inches at the lower mechanical seal during operation.
6. The mechanical seals will be a double mechanical seal system, consisting of two totally independent mechanical seals, each with its own single spring system acting in a common direction. The upper seal will have a silicon carbide rotating face and a silicon carbide stationary face and will be located between the seal chamber and the motor housing. The lower seal will have a silicon carbide rotating face and a silicon carbide stationary face. Both seals will have 300 series stainless steel hardware and Buna-N elastomers.
7. Seals must operate in an oil filled chamber which shall provide superior heat transfer & seal cooling. Seal faces shall be lapped and polished to a tolerance of one light band. The seals must not require routine maintenance or adjustment but should be easily replaced. The seal shall be commercially available and not a pump manufacturer's proprietary design.
8. The common pump and motor shaft shall rotate on two bearings. These bearings shall be high quality and commercially available. The bearings shall operate in an oil bath environment for superior lubrication, cooling and life. Permanently lubricated bearings are not acceptable. The pump shall be a two-bearing design consisting of an upper ball bearing carrying the thrust loads, and lower ball bearing for the purpose of carrying the thrust loads and radial loads. Sleeve bearings will not be considered equal. The lower bearing shall be of the single row ball type, locked in position to accept radial and axial thrust loads and the upper bearing shall be of the single ball type for radial loads as needed to provide a minimum L10 Life of 50,000 hours at -50% to +50% of BEP.
9. Gaskets except for seal gland and bearing retainer shall be of the angular gland compression O-ring type eliminating critical slip fits and the possibility of damage during service associated with sliding O-ring sealing arrangements. Mating surfaces where watertight sealing is required shall be machined and fitted with O-rings.
10. The exterior of the pump liquid end shall be coated per Article 2.3 FINISHES below.
11. The pump shall be equipped with a stainless-steel nameplate, located in an easily accessible location. The following data will be included on the nameplate:
    a. Manufacturer's Name
    b. Pump Part Number, Model Number and Serial Number
    c. Motor Horsepower Rating
    d. Voltage, Phase, and Frequency
    e. Motor Speed
    f. Motor Full Loads Amps
    g. Ambient Temperature Rating
    h. Code Letter

i. Impeller Diameter
j. Motor Insulation Class

12. Spare Parts
    a. One spare full diameter impeller for each pump model
    b. One spare cutter assembly set
    c. One spare set of mechanical seals
    d. All gaskets
    e. All o-rings
    f. Spare set of starting components (for 1 ph only)

C. Motor Components

1. The major driver components will be ASTM A48 Class 30 Cast Iron. The motor shaft shall be of 416 stainless steel.
2. The motor shall be a squirrel cage induction type and shall be dielectric oil filled for optimal thermal management and maximum bearing life. The pump shall be capable of operating in a totally, partially, or non-submerged condition for extended periods of time without damage due to heat being generated. Oil used must be able to be disposed of as nonhazardous waste. Air-filled motors with grease lubricated bearings shall not be acceptable. The motor shall be NEMA Type B. The stator windings shall be insulated with moisture resistant and spike resistant Class F varnish and magnet wire insulation, rated for 155°C (311°F). The motor shall be 230 volts, 60 Hz, 1 phase, and shall have a voltage tolerance of +/- 10% from nominal voltage. The motor shall be designed to run continuously in a 40° (104°F) ambient environment.
3. Single Phase motors shall be of the capacitor start capacitor run design. The start and run components will be provided with the pump and shall be installed on the control panel.
4. The stator shall be press fit into the motor housing, for mechanical stability and optimal heat transfer. The use of bolts or pins to secure the stator into the housing will not be acceptable.
5. The motor shall have a minimum 1.0 service factor. The motor shall be designed for usage in submersible applications only. The motor horsepower shall be non-overloading of the nameplate rating throughout the entire pump performance curve. The motor shall meet the performance requirements of a NEMA L speed torque curve.
6. The rotor bars shall be die cast aluminum.
7. The motor will be capable of operating continuously at a maximum submergence depth of 66 ft (20m).
8. The motor will be capable of 11.5 starts per hour with a minimum rest time of 77 seconds between starts without overheating.
9. Motor shall be CSA Listed to the CSA harmonized standard.

D. Sensors

1. Motors shall have built-in thermal overload protection.
    a. For single phase pumps, an automatically resetting, heat sensing thermal device that interrupts current flow if excessive temperature and/or current is detected shall provide protection against excessive temperature.
    b. For three phase pumps, Protection against excessive temperature shall be provided by heat sensor thermostat attached to the stator windings and connected in series with the contactor coil in the control panel.
2. The optimal moisture sensor detection system shall consist of a dual probe system in the seal chamber. The probes shall monitor conductivity of the oil. It is recommended to use a

pump monitor relay (PMR) installed inside the control panel which will trigger a warning light and shut down the pump when pumped fluid is detected.

E. Power Cord

1. The pumps shall be equipped with 50 ft. of type SOW power cord. The power cord and motor shall be connected via quick disconnect pin terminals located within the motor housing. Pin receptacles shall be crimped and molded to the power cord in a PVC plug. The plug shall be secured with a stainless steel compression plate to prevent water from entering the motor housing and to provide strain relief at the point of cord entry. A polybutylene terephthalate terminal block with brass pin inserts shall connect the power cord leads with motor leads. The ground pin shall be longer than the other pins such that the ground connection is the first connection made and the last connection broken when the plug is inserted and removed, respectively. A Buna-N O-ring shall provide isolation sealing between terminal block and the motor housing. The cord assembly shall be guaranteed by the manufacturer to meet UL approval for submersion.
2. The pumps shall be capable of being easily removed and replaced without the removal of the pump power cord from the electrical conduit.

2.3 FINISHES:

A. The pump shall be powder coated with an epoxy primer and polyester topcoat.

2.4 ACCESSORIES:

A. The pump shall be supplied with a Break Away Fitting assembly (BAF), which will allow the pump to be installed and operate continuously in a vertical submerged condition. The stationary portion of the BAF shall be installed in the wet pit, thus removing the need for personnel to enter the wet well. The stationary portion of the BAF shall consist of a cast iron base elbow, guide rails, an upper guide bracket, and an optional intermediate guide bracket. The intermediate guide bracket is only required for depths of 13 ft (4m) or more. The cast iron base elbow shall be bolted to the wet well floor. The movable portion of the BAF shall consist of a cast iron slide, which bolts to the pump discharge flange. On all models, this slide guides the pump up and down the guide rails, and includes a gasket, which ensures a complete seal. The two guide rails must be provided by others, and should be schedule 40 metallic pipe in a non-corrosive material, such as stainless steel. These guide rails shall be attached to the base elbow at one end, and the upper guide bracket at the other. The upper guide bracket shall be attached to the underside of the wet well cover. The bracket shall have elastomer plugs, which reduce noise and rail vibration. The guide rails serve only to guide the pump, and do not carry the weight of the pump. Designs that do not use a movable gasket, use guide chain, or use a single guide rail shall not be accepted.

B. The pump shall be supplied with a “C” channel rail assembly to facilitate removal of the pump(s) from ground level. The “c”-channel guide rail assembly is made of 300 series stainless steel. The guide rail mounts to the upper and lower horizontal brackets attached to the basin wall. The wait also rests on the basin floor. The stainless steel guide rail supports the pump the required distance from the basin floor. Guide brackets are attached to the pump from positioning of the unit on the guide rail during installation and removal. The stationary fitting of the hydraulically sealed discharge is powder coated machined cast iron. The stationary fitting has a fiber reinforced neoprene diaphragm clamped between the stainless steel rail and the stationary pressure vessel. The moveable fitting is held against the stationary fitting by the construction of the stainless steel rail, aligning the moveable fitting to the flexible diaphragm for proper sealing of the two surfaces.

C. The pumps shall be installed on a pump support stand that is fabricated of 300 series stainless steel with rubberized pads on the feet, fixing the pump at the required distance to provide adequate suction clearance. The pumps shall be equipped with a 1.25-inch NPT or BSP discharge fitting which includes a check valve and integrated anti-siphon.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's printed instructions (and state/municipal, and other governing standards).
   1. The pump be capable of operating continuously in a vertical submerged condition
   2. Contractor shall complete all piping and supports, make all electrical power and control connections, and install all safety devices and instrumentation prior to equipment start-up.
   3. All anchor bolts, nuts, washers, and sleeves shall be Type 316 stainless steel furnished by the contractor and shall be of ample size and strength for the purpose intended.

3.2 QUALITY CONTROL

A. Factory tests:
   1. The pump manufacturer shall perform a pump performance test to verify hydraulic performance as standard. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.
   2. If certified testing is required, the manufacturer shall offer to perform tests in accordance with Grades B, E, or U of Hydraulic Institute standards 11.6 and 14.6.
   3. A check of the motor voltage and frequency shall be made as shown on the name plate.
   4. A motor and cable insulation test for moisture content or insulation defects, in accordance with CSA criteria.
   5. Each motor shall be dielectric tested to verify the motor insulation integrity.
   6. Contact the manufacturer for tests not listed here.

B. Manufacturer's Representative:
   1. The representative shall inspect the equipment, carry out the equipment start-up procedures, and provide training to the operators in how to effectively operate and maintain the equipment. The manufacturer's representative may be an employee of the manufacturer's distributor.
   2. Prior to Operational Testing, the CONTRACTOR shall have the manufacturer's representative perform the following:
      a. Megger test the stator and power cables
      b. Check proper rotation
      c. Check power supply voltage
      d. Measure motor operating load and no-load current.
      e. Check level control operation and sequence.
   3. During Final Acceptance Testing, the manufacturer's service representative shall review recommended operation and maintenance procedures with the OWNER'S personnel.
   4. The manufacturer's representative shall be present for a period of not less than one (1) day to complete the following:
      a. Inspect completed installation
      b. Observe equipment testing

c. Observe equipment start-up
d. Instruct operational personnel on equipment operation and maintenance

C. Field Tests:
1. After installation, the pumping system shall be field tested using potable water for a minimum of 30 minutes and check for correct direction of rotation in the presence of the manufacturer's representative and the Engineer. The CONTRACTOR shall be responsible for providing water and for conveying the water to the site and providing required meter and back-flow prevention check valve assembly. Each pump shall be cycled through the sequence of operation "pump on" as the level rises in the wet well and then "pump off" during draw down. Once each pump has been tested separately, the pumps will be operated in parallel.
2. Each pump shall operate over its intended operating range without undue noise, vibration, or cavitation. The CONTRACTOR shall monitor and record vibration at three symmetrically located points on each pump at maximum and minimum speed and supply data to the OWNER.

D. Inspections:
1. Upon completion of the installation and on-site testing, and before acceptance by the OWNER, the Pump Manufacturer or the authorized Pump Manufacturer's Representative
2. shall submit a written statement that the pump installation has been inspected and is completed in accordance with the manufacturer's recommendations.

3.3 ADJUSTING

A. Adjust parts for smooth, uniform operation.

3.4 CLEANING

A. Clean as recommended by manufacturer. Do not use materials or methods which may damage finish (surface) or surrounding construction.

END OF SECTION 33 3211

THIS PAGE INTENTIONALLY LEFT BLANK